

THE ATLANTIC

International Congress
of Medical Science and Research

6-7 Online
August
2022

www.atlantic-medicalcongress.org



1ST International the Atlantic Congress of Medical Science and Research – 6-7 August, 2022 ONLINE

Atlantic J Med Sci Res 2022;2(Suppl 1):p1–p61 © 2022 by authors and the Atlantic Journal of Medical Science and Research Publishing Inc.

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ORAL PRESENTATION FULL PAPERS

[OP-1]

Investigation of the Relationship Between Plasma Tryptophan Metabolite Levels and Lithium Treatment Response in Euthymic Bipolar Patients

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Aim: With this background, it was aimed to compare tryptophan metabolite levels between bipolar patients and healthy control group and to investigate the relationship between lithium treatment response and tryptophan metabolite levels of euthymic bipolar patients(BP).

Material and Methods: 52 euthymic BP who were on lithium treatment and followed in Department of Psychiatry of Selçuk University were included in the study. Lithium treatment response status was determined according to the Alda scale. Serum tryptophan metabolite levels were compared between BP and healthy controls(HC). The correlation and association between the lithium response levels of the patients and the serum tryptophan metabolites were evaluated.

Results: In the logistic regression analysis, only serum kynurenic acid(KYNA) level was found to be significantly lower in the euthymic bipolar patient group than in the healthy control group.

When we compare the levels of tryptophan(TRP) and its metabolites with lithium treatment response; a positive correlation was found between the group that responded well to lithium and TRP levels.

Conclusion: Our findings indicate that KYNA levels might be used as a screening test for discriminating bipolar patients from the HC. TRP levels might be used to predict lithium treatment response in spite of low specificity and low sensitivity levels.

Keywords: Tryptophan metabolites, lithium treatment response, bipolar disorder

INTRODUCTION

Bipolar disorder is a chronic mood disorder characterized by recurrent mania and depression periods. In patients diagnosed with bipolar disorder, psychosocial functionality is impaired and disability risk is high (1). Repetitive disease periods cause material and moral losses and significantly affect the quality of life and functionality of patients. In addition, the lifetime suicide rate is known to be approximately 20% in patients with this disorder (2). However, with appropriate treatment, disease periods can be corrected and the recurrence of the disease can be prevented. Lithium, one of the gold standard drugs in treatment, has been found to significantly reduce the manic episode, the depression period (3) and, more importantly, the risk of suicide in methanalysis studies (4). However, the mechanisms by which lithium apply its supposed clinical effects are largely unknown and approximately one third of the patients cannot respond to lithium treatment (5).

Our lack of information on whether lithium treatment is effective for a particular group of patients with bipolar disorder leads to unnecessary dosing and delays finding effective treatment (6). At this point, the patients with bipolar disorder are the main clinical variables showing well or bad response to lithium, but their distinctive and predictive nature is limited (7,8). In recent years, the predictive biochemical and genetic studies have accelerated (9).

At this point, proper treatment planning for patients who well respond to lithium without delay will prevent material and moral

losses. On the other hand, in the etiology of bipolar disorder for the last few years, the importance of quinurenic acid(glutamate NMDA receptor antagonist), which is a product of Kynurenine Pathway of tryptophan metabolism draws attention (10,11). In euthymic bipolar individuals, a decrease in serum kinurenic acid levels and an increased rate of 3-hydroxyquinurine/kinurenic acid have been demonstrated (12). In patients with bipolar disorder, the kinurenic acid / quinolinic acid ratio, assumed neuroprotective index, is reported to be significantly lower before drug treatment compared to controls (13,14). At this point, considering the effects of lithium, which stands out with its neuroprotective properties in the treatment of bipolar disorder (15,16,6), on the tryptophan pathway (17), it is remarkable investigating the role of tryptophan pathway metabolites in predicting the response to lithium. In the light of all this information, we also aimed to investigate the relationship between lithium treatment response and plasma tryptophan metabolite levels in euthymic bipolar patients and evaluate whether these metabolites may be a biochemical marker in predicting lithium response.

MATERIAL AND METHODS

Study population and Sampling

The study was performed in the medical faculty hospital of Selçuk University, Department of Mental Health and Diseases, and in the Biochemistry laboratory.

After the “Ethics Committee Approval” of our hospital, consent was obtained from the patient and voluntary control group. Totally, 52 patients aged between 18-65 years (26male, 26

female) and diagnosed with bipolar disorder according to DSM-5 diagnostic criteria at the Mazhar Osman Mood Center of the Psychiatry Department of the Faculty of Medicine were studied. The patients were euthymic for at least 8 weeks (Young Mania Rating Scale <7, Hamilton Depression Rating Scale <7). The control group who applied to the Health Committee of Selcuk University Medical Faculty Hospital aged between 18-65 years (26 Male, 26 Female) and without any psychiatric or other medical diseases was selected on a voluntary basis.

Method

Patients who participated in the study and who were previously diagnosed with bipolar disorder according to DSM-5 diagnostic criteria were confirmed to be in the euthymic period with psychiatric interview, HDRS, and YMRS. Their suitability was evaluated according to inclusion and exclusion criteria. Information obtained from patients, patient relatives, patients' old medical records, hospitalization files and follow-up files were recorded on the patient data record form. ALDA scores of patients using lithium were calculated according to the information obtained. BMI was calculated by measuring the height and weight of the patients. 8 hours fasting blood samples of the cases were drawn into vacuum gel tubes in a laboratory environment. Blood samples were centrifuged at 3000 rpm for 10 minutes. Plasma samples were collected and placed in eppendorf tubes and stored at -40 ° C until the day of study. 100 microliter serum sample was deproteinized with 100 microliter precipitator containing internal standard in trichloroacetic acid and centrifuged for 14 minutes at 14000 rpm. A 50 microliter supernatant was taken and used in the analysis. The analyzes were carried out with liquid-chromatography mass spectrometer device (LC-MS / MS) in our hospital.

Statistical analysis

The data were evaluated using SPSS (Statistical Package For Social Sciences) 21 program. Numerical variables are given as mean $\pm$ standard deviation if they meet the normal distribution, and if not, the minimum, maximum and median values were used. Nominal demographic and clinical variables were stated as ratio and number, and comparisons were made with chi-square test. The Komogorov Smirnov test and histogram were performed to see if all parametric data are suitable for normal distribution. Numerical data showing normal distribution were compared using the t test while those without normal distribution were compared using the Man-Whitney U test. Pearson test was used for correlation between variables that distributed normally, and Spearman test was used for those who did not. In addition, logistic regression analysis (backward) was performed to evaluate the effective variables in determining the lithium treatment response, and the sensitivity and specificity values of the tryptophan and its metabolites were calculated by determining the treatment response.

RESULTS

Comparison of Tryptophan and Metabolite Levels

Patients' and control groups' tryptophan (TRP), kynurenine (KYN), kynurenic acid (KYNA), 3-hydroxykynurenine (3-HK), 3- hydroxykynurenine / kynurenine (3-HK / KYN) and kynurenine / tryptophan (KYN / TRP), The ratios of kynurenic

acid / kynurenine (KYNA / KYN), 3- hydroxykynurenine / kynurenic acid (3-HK / KYNA) are given in table 1. In comparison of the ratio of TRP, KYN, KYNA, 3-HK, 3-HK / KYN and KYN / TRP, KYNA / KYN and 3-HK / KYNA of the groups TRP, KYN, KYNA, 3-HK ve KYN/TRP of the patients were significantly lower than those of the controls.

Correlation Analysis of Clinical Variables and Tryptophan Metabolites

In the correlation analysis, the total number of mania / hypomania and the ratio of kynurenine / tryptophan (KYN / TRP) were found to be correlated. No correlation was found between total mania / hypomania period, total depression period, total period numbers and TRP, KYN, KYNA, 3-HK, and 3-HK / KYN values (Table 2).

Evaluation of the Relationship Between Tryptophan and Metabolites by Logistic Regression Analysis in Separation of Patients and Control Groups

In the covariate logistic regression analysis a significant correlation was found between KYNA and VKI and the patients groups. (for KYNA OR=0.94(0.92)-0.97, $p < 0.0001$), (for VKI OR=1.21(1.07)-1.37, $p = 0.003$)

Comparison of Lithium Treatment Response with Tryptophan and Metabolites levels

In the comparison of lithium treatment response with tryptophan and metabolite levels, there was a significant correlation between the group that responded well to lithium treatment and the level of tryptophan (TRP) were found to be related (Table 3). KYN, KYNA, 3-HK, 3-HK / KYN, KYN / TRP, KYNA / KYN, 3-HK / KYNA ratios were not different between the two groups.

Lithium treatment response regression analysis

Depending on whether lithium treatment is good or bad (good response > 7)

BMI, patient's age, number of disease periods, TRP, KYN, 3-HK, KYNA, 3-HK / KYN, KYN / TRP, KYNA / KYN, 3 HK / in the logistic regression analysis, in which KYNA ratios were assigned as covariates, only the relationship between the patient's age and lithium treatment response was found among the variables (OR = 1.06 (1,001-1,114), $P = 0,0046$).

Lithium treatment response total scores in the roc analysis in which the TRP relationship was evaluated, it was calculated that when the TRP level was 5730 ng/ml, lithium treatment response with 73.3 % sensitivity and 59.1% specificity could be predicted (Table 4).

DISCUSSION

As a result of this study, the ratio of plasma tryptophan(TRP), kynurenine(KYN), kynurenine/ tryptophan(KYN/TRP) was found to be significantly lower in the euthymic BD patient group compared to the control group. Findings on KYN, TRP and KYN / TRP ratio in bipolar mood disorder are inconsistent (18,19). This may be due to the heterogeneity caused by the patients included in the study since bipolar disorders consists of different episode types (mania, hypomania, depression) and recurrence of the episodes during illness course varies in each patient. We also

Table 1. Comparison of tryptophan and metabolite levels

	Patients (BD) ($\bar{x} \pm SD$)	Control(HC) ($\bar{x} \pm SD$)	t/z	p
TRP	7833.46 $\pm$ 3956.40	10445.57 $\pm$ 2065.51	4.22	<0.001
KYN	429.90 $\pm$ 270.84	729.53 $\pm$ 309.10	5.26	<0.001
KYNA	38.42 $\pm$ 24.09	69.58 $\pm$ 20.73	7.07	<0.001
3-HK	28.63 $\pm$ 22.29	47.16 $\pm$ 19.03	4.56	<0.001
3-HK /KYN	0.72 $\pm$ 0.30	0.68 $\pm$ 0.19	0.76	0.45
KYN / TRP	0.054 $\pm$ 0.018	0.070 $\pm$ 0.026	3.81	<0.001
KYNA /KYN	0.094 $\pm$ 0.035	0.10 $\pm$ 0.032	1.14	0.26
3-HK / KYNA	0.72 $\pm$ 0.31	0.68 $\pm$ 0.19	0.76	0.45

$\bar{x}$; Mean, SD; standard deviation, TRP; Tryptophan, KYN; Kynurenine, KYNA; Kynurenic acid, 3-HK; 3-Hydroxykynurenine, 3-HK / KYN; 3- Hydroxykynurenine / Kynurenine, KYN / TRP; Kynurenine / Tryptophan, KYNA / KYN; Kynurenic acid / Kynurenine, 3-HK / KYNA; 3- Hydroxykynurenine / Kynurenic acid (P = 0.001)

Table 2. Correlation analysis of treatment response and clinical variables and tryptophan metabolites

	Mania / hypomania number	Depression number	Total number of Periods	Lithium response score
TRP				
<i>r/rho</i>	0.225	0.135	0.217	0.206
<i>p</i>	0.109	0.339	0.123	0.143
KYN				
<i>r/rho</i>	0.035	0.166	0.127	0.168
<i>p</i>	0.804	0.241	0.371	0.234
KYNA				
<i>r/rho</i>	0.164	0.177	0.175	0.127
<i>p</i>	0.244	0.210	0.214	0.367
3-HK				
<i>r/rho</i>	0.173	0.164	0.161	0.135
<i>p</i>	0.221	0.245	0.255	0.340
3-HK /KYN				
<i>r/rho</i>	0.030	0.031	0.010	0.092
<i>p</i>	0.835	0.825	0.942	0.514
KYN /TRP				
<i>r/rho</i>	-0.348*	0.045	0.165	0.072
<i>p</i>	0.011	0.75	0.242	0.614

* $p < 0.05$ statistically significant, TRP; Tryptophan, KYN; Kynurenine, KYNA; Kynurenic acid, 3-HK; 3-Hydroxykynurenine, 3-HK / KYN; 3- Hydroxykynurenine / Kynurenine KYN / TRP; Kynurenine / Tryptophan

Table 3. Comparison of lithium treatment response with tryptophan and metabolites levels

	lithium treatment response is good ($\bar{x} \pm SD$)	lithium treatment response is bad ($\bar{x} \pm SD$)	t/z	p
TRP	6620.0 $\pm$ 2924.39	8723.33 $\pm$ 4404.41	-2.06	0.04*
KYN	357.22 $\pm$ 230.94	483.20 $\pm$ 288.86	-1.68	0.098
KYNA	32.85 $\pm$ 20.88	42.52 $\pm$ 25.95	-1.44	0.15
3-HK	23.97 $\pm$ 20.41	32.05 $\pm$ 23.32	-1.2	0.2
3-HK/KYN	0.68 $\pm$ 0.29	0.75 $\pm$ 0.36	0.82	0.41
KYN / TRP	0.054 $\pm$ 0.024	0.055 $\pm$ 0.014	-0.77	0.43
KYNA/KYN	0.098 $\pm$ 0.043	0.091 $\pm$ 0.028	0.84	0.41
3-HK/KYNA	0.68 $\pm$ 0.29	0.75 $\pm$ 0.32	0.82	0.41

** $p < 0.05$ statistically significant, $\bar{x}$; Mean, SD; standard deviation, TRP; Tryptophan, KYN; Kynurenine, KYNA; Kynurenic acid, 3-HK; 3-Hydroxykynurenine, 3-HK / KYN; 3- Hydroxykynurenine / Kynurenine, KYN / TRP; Kynurenine / Tryptophan, KYNA / KYN; Kynurenic acid / Kynurenine, 3-HK / KYNA; 3- Hydroxykynurenine / Kynurenic acid

Table 4. ROC analysis results in finding lithium treatment response

	AUC	Cut point	Sensitivity%	Specificity%	PPV	NPV
TRP	0.63	5730	73.3	59.1	71	61.9
KYN	0.62	418	53.3	77.3	76.2	54.8
KYNA	0.59	28.4	60	63.6	69.2	53.8
3-HK	0.59	14.5	73.3	54.5	68.8	60
3-HK/KYN	0.47	0.098	93.3	18.2	60.9	66.7
KYN/TRP	0.57	0.035	100	18.2	62.5	100
KYNA/KYN	0.54	0.064	26.7	90.9	80	47.6
3-HK/KYNA	0.54	0.582	73.3	50	66.7	57.9

TRP; Tryptophan, KYN; Kynurenine, KYNA; Kynurenic acid, 3-HK; 3-Hydroxykynurenine, 3-HK / KYN; 3- Hydroxykynurenine / Kynurenine, KYN / TRP; Kynurenine / Tryptophan, KYNA / KYN; Kynurenic acid / Kynurenine, 3-HK / KYNA; 3- Hydroxykynurenine / Kynurenic acid, PPV: Positive Prediction Value, NPV: Negative Prediction Value, AUC: Area Under the Curve

found that plasma KYNA and 3-HK levels of the euthymic BD patient group were significantly lower than those of the healthy control group. However, there was no significant difference between the 3-HK/KYNA ratio between the two groups. This could be due to the naturally low KYN levels. A recent study demonstrated a decrease in serum KYNA levels and an increased ratio of 3-HK / KYNA in euthymic bipolar individuals (12). It has been reported that due to its high sensitivity, KYNA can be used clinically to screen depressed patients and healthy people.¹⁹ Similar studies have been conducted for bipolar disorders, but to date, there has been no data reported with strong sensitivity and specificity regarding predictability. In our study, after the logistic regression analysis we confirmed that plasma KYNA concentrations in the euthymic bipolar patients were significantly lower than the healthy controls. With this respect, we think that KYNA can be used as a screening test or predictor to distinguish not only depressed patients but also bipolar patients in the euthymic period from the healthy control group. However, it is difficult to justify this as a tool considering the relatively low sensitivity and specificity levels. Therefore, prospective studies with larger sample size are required to confirm our findings.

On the other hand, in the studies evaluating the relationship between tryptophan metabolites and clinical variables of the disease, it has been stated that metabolite formation after KYN may be a better predictor of in the destruction steps of TRP (20). In our study, similar ratio of 3-HK/KYNA in the euthymic bipolar patients and the healthy controls may indicate that the destruction of tryptophan to the serotonin side rather than a process associated with post-KYN metabolites may play a role in the etiopathogenesis. Our findings contradict the studies suggesting that the ratio of KYNA/3-HK, which is accepted as “neuroprotective index”, decreased. This discrepancy may be related to limitations such as relatively small sample size and differences in the clinical characteristics of the patients (13,14).

When we compare the levels of TRP and its metabolites with lithium treatment response; a positive correlation was found between the group that responded well to lithium and tryptophan (TRP) levels. KYN, KYNA, 3-HK, 3-HK/KYN, KYN/TRP, KYNA/KYN, 3-HK/KYNA ratios were not different between

both groups. Lithium treatment response total scores in the roc analysis in which the TRP relationship was evaluated, it was calculated that when the TRP level was 5730 ng/ml, lithium treatment response with 73.3 % sensitivity and 59.1% specificity could be predicted. In the logistic regression analysis, a variable determining lithium well response could not be determined. To the best of our knowledge, in the literature, there is no study directly comparing the levels of TRP and its metabolites with lithium treatment response by performing ALDA scoring. In this respect, our results cannot be further interpreted since it is the first study in this field. However, it is a limitation that all patients were included from those who used lithium, that is, those who previously used lithium and stopped taking the drug due to unresponsiveness. It is unlikely that there will be a single biomarker for lithium tolerability, so further researches are required with a holistic scientific approach that includes clinical factors and multimodal biomarkers (21).

CONCLUSION AND RECOMMENDATIONS

In the light of our findings, it could be interpreted that KYNA levels can be used as a screening test to distinguish bipolar patients from the healthy controls. This study indicates that TRP levels can be used to predict lithium treatment response, despite low specificity and sensitivity levels. However, these findings need to be confirmed by other studies which consider the limitations of our study. As a matter of fact, considering the complex interaction of clinical, biological and disease-related factors in determining treatment response in bipolar disorders, it is quite difficult to argue that TRP levels are the only predictor of lithium treatment response. However, we think that our study is important considering that this is the first study to evaluate the relationship between lithium treatment response and tryptophan metabolite levels. We believe that our findings will provide a basis for long-term follow-up studies with a larger-sample by comparing TRP levels before and after lithium treatment.

Financial Disclosure

The project is supported by Selçuk University Scientific Research Committee with project number 17102049.

Acknowledgement

We thank Prof. Dr.İdris Mehmetoğlu and Oğuzhan Tok for their contributions.

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[OP-2]

Rehabilitation of Head and Neck Lymphodema Developing Secondary to Follicular Dendritic Cell Sarcoma

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Follicular dendritic cell sarcoma (FDCS) is a rare malignant tumor. The available literature has defined only 200 cases across the world so far. The tumor was first described by Monda et al. in 1986 (1). While 2/3 of the cases show nodal involvement, 1/3 may demonstrate extranodal involvement, including mediastinum, tonsil, GIS, and soft tissue. Most of the cases may present with an early-stage asymptomatic or unilateral painless palpable mass (2,3).

Head and neck lymphedema (HNL) frequently occurs in patients receiving radiotherapy after cancer surgery. While overlooked in the early stages, it may become an irreversible and difficult-to-treat complication of cancer treatment in the later stages. Today, the gold standard treatment method in HNL is Complete Decongestive Therapy (CDT). CDT is a multi-component treatment method consisting of skin care, Manual Lymphatic Drainage, Compression therapy, and exercise. In the Kinesio Taping technique, the superficial layer of the skin and subcutaneous tissues are pulled with the help of a particular tension method during bonding, which increases the lymphatic drainage with the resultant negative pressure. Yet, the relevant literature has never focused on the effectiveness of Kinesio Taping in HNL. Ultimately, we aimed to reveal the effect of a treatment combining CDT and Kinesio Taping on treatment efficacy and quality of life in HNL patients.

Keywords: Postmenopausal osteoporosis, oxidative stress, reactive oxygen species

INTRODUCTION

Follicular dendritic cell sarcoma (FDCS) is a rare malignant tumor. The available literature has defined only 200 cases across the world so far. The tumor was first described by Monda et al. in 1986 (1). While 2/3 of the cases show nodal involvement, 1/3 may demonstrate extranodal involvement, including mediastinum, tonsil, GIS, and soft tissue. Most of the cases may present with an early-stage asymptomatic or unilateral painless palpable mass (2,3).

Head and neck lymphedema (HNL) frequently occurs in patients receiving radiotherapy after cancer surgery. While overlooked in the early stages, it may become an irreversible and difficult-to-treat complication of cancer treatment in the later stages. Today, the gold standard treatment method in HNL is Complete Decongestive Therapy (CDT) (4). CDT is a multi-component treatment method consisting of skincare, Manual Lymphatic Drainage, Compression therapy, and exercise. In the Kinesio Taping technique, the superficial layer of the skin and subcutaneous tissues are pulled with the help of a particular tension method during bonding, which increases the lymphatic drainage with the resultant negative pressure (5,6).

Yet, the relevant literature has never focused on the effectiveness of Kinesio Taping in HNL. Ultimately, we aimed to reveal the effect of a treatment combining CDT and Kinesio Taping on treatment efficacy and quality of life in HNL patients.

CASE REPORT

A 54-year-old female patient started to complain of bleeding and recession in her gums two years ago, and these complaints gradually increased over time. Then, she noticed a palpable painless mass under her right mandible a year ago and applied

to a physician with this complaint. The results of the neck MRI revealed a diffusion-limiting mass appearance of 35x30 mm in the infrahyoid area of the left cervical region, isointense in t1 sequence, hyperintense in t2 sequence, and with contrast enhancement. The patient's pathology report was evaluated as follicular dendritic cell sarcoma as a result of the biopsy taken twice. Then, 30 sessions of radiotherapy were administered after lymph node dissection in surgical treatment.

When the patient applied to our oncological rehabilitation outpatient clinic, her physical examination revealed pitting edema in the soft tissue (MD Anderson Cancer Center stage 1b) in the submental and submandibular areas. The skin was dry; jaw movements were painful; the cervical spine's range of motion (ROM) was painful and limited in all directions; postural kyphosis was increased. Following radiotherapy, the patient started to complain of dysphagia (difficulty in swallowing), especially against solid foods. We obtained informed consent from the patient for the present case report.

Within a 21-day HNL treatment program, we recruited the patient to receive regular skincare, manual lymphatic drainage, cervical and shoulder isometric exercises, posture exercises, facial and mimic exercises to strengthen the facial muscles, oral-motor exercises for the treatment of dysphagia, and strengthening swallowing maneuvers.

In addition to CDT, we performed KinesioTaping using the reorientation technique at three days intervals. As shown in this technique, the starting point of the tape extends from the bilateral supraclavicular fossa to the submandibular area on both sides of the neck (Figure 1). In addition, we used a compression face garment, not exceeding 3-4 hours a day.



Figure 1: Kinesio Taping with redirection technique

We measured pre- and post-treatment ROM, used neck disability index and the Quality of Life-30 Questionnaire (QOL-30), and utilized facial composite and circumferential measurement scores to evaluate neck lymphedema volume.

After the 21-day treatment program, we discovered that the cervical spine's ROM increased by 10 degrees in all directions. The patient's neck disability score decreased from 42 points (complete disability) before the treatment to 20 points (moderate disability) after the treatment. In the QOL-30, we determined an improvement in the functional and general quality of life subscales, while there was a decrease in the symptoms subscale.

Facial and neck composite circumferential measurements on the patient's appearance below.



Then, we realized a decrease in the HNL volume at all levels after the treatment. We show the significant volume difference in the patient's head and neck lymphedema in table 1.

Table 1: Facial and Neck Volume Difference

Facial composite, circumferential measures	PRE-TREATMENT		POST-TREATMENT	
	right	left	Right	left
1. Tragus to chin	16 cm	17 cm		14 cm
2. Tragus to mouth corner	12 cm	12 cm	10 cm	10 cm
3. Mandible to nasal wing	13,5 cm	14 cm		
4. Mandible to medial canthus	15,5 cm	14,5 cm	14 cm	14 cm
5. Mandible to exocanthus	11,5 cm	10,5 cm		
6. Chin to medial canthus	12,5 cm	12,5 cm	11,5 cm	11 cm
7. Mandible to chin.	14 cm	15 cm	12 cm	12 cm

Neck composite, circumferential measures		PRE-TREATMENT	POST-TREATMENT
1.	Superior neck	51 cm	48 cm
2.	Middle neck	39,5 cm	37 cm
3.	Inferior neck	41 cm	37 cm

Finally, the progressive response of HNL to Kinesio Taping and CDT were shown as pre-treatment (Figure 2 (A)) and post-treatment (Figure 2 (B)).



Figure 2: (A): Pre-treatment

(B): Post-treatment

DISCUSSION

There is still no standard treatment procedure in the literature for HNL (7). Moreover, the available literature hosts no studies using CDT and Kinesio Taping treatment.

Consistent with our study, in their study on HNL, Smith et al. showed that up to 60% of patients benefited from CDT treatment. Another study by Doke et al. concluded that the patients had an improvement in their cervical spine's ROM and a decrease in their pain scores thanks to a regular exercise program. Moreover, Ozdemir et al. also achieved effective results in HNL using CDT (8-10).

CONCLUSION

We think that the combined use of Kinesio Taping and CDT, which has not been applied before in the literature, may offer much more effective and rapid results in recovering lymphedema secondary to head and neck cancer and patients' quality of life. This study will inevitably be a resource for many physicians

in the diagnosis and treatment of lymphedema secondary to head and neck cancer. Besides, further studies are needed for introducing appropriate and effective treatment methods.

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[OP-3]

The Relationship of Ngai and S100a12 Blood Levels With Disease Activity in Patients With Ulcerative Colitis

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Aim: NGAL can be considered as an acute phase protein. It has been shown by clinical studies that serum NGAL levels increase in some diseases with inflammation. Serum S100A12 is a pro inflammatory protein that is found in many tissues of healthy individuals, especially in the spleen and lung, and is synthesized and stored in neutrophil granulocytes. In our study, we aimed to investigate the relationship of these markers with UC disease activity by examining serum S100A12 and NGAL protein levels secreted by neutrophils, which increase in the presence of inflammation.

Material and methods: Venous blood samples were taken to analyze NGAL and S100A12 levels, as well as routine laboratory tests from UC patients and control group patients included in the study during active and remission periods.

Results: While serum NGAL levels in the active period of the patients were 152.26 ± 36.48 , it was 123.97 ± 37.42 in the remission group and 123.88 ± 22.25 in the control group. There was a statistically significant difference between the groups in terms of NGAL ($p=0.001$). While S100A12 in the active period of the patients was 2598.17 ± 672.8 , it was 1179.55 ± 385.08 in the remission group and 893.72 ± 209.73 in the control group. There was a statistically significant difference between the groups in terms of S100A12 ($p<0.001$).

Conclusions: In our study, serum NGAL and S100A12 levels were found to be statistically significantly higher in the active UC patient group than in the remission and control groups. However, more extensive studies are needed.

Keywords: Ulcerative Colitis, NGAL, S100A12

INTRODUCTION

Inflammatory bowel diseases (IBD) are chronic inflammatory diseases of unknown etiology, progressing with activation and remissions; it is divided into 2 groups: ulcerative colitis (UC) and Crohn's disease (CD). Ulcerative colitis; It is a chronic and recurrent disease that causes diffuse inflammation in the intestinal tract, involving only the colonic mucosa. Inflammation usually starts from the rectum and progresses proximally and may involve part or all of the colon (1-3). The incidence and prevalence of the disease in the world vary in terms of regional, ethnic structure, socioeconomic status, age and gender. Although the etiology of IBD has not been fully elucidated, environmental, genetic and immunological factors are thought to play an important role (4).

Intestinal inflammation in IBD causes an increase in acute phase reactants and leukocyte migration to the inflammation area. As a result, many pro-inflammatory proteins formed in the environment can be detected in serum and stool (5). As a result of the acute phase response, an increase in the number of leukocytes can be observed. An increase in acute phase reactants such as leukocyte and platelet counts, CRP, erythrocyte sedimentation rate (ESR), fibrinogen and ferritin are important indicators used to determine the activity level of the disease (6).

NGAL also known Lipocalin-2; it is secreted from some cells under stress in the body. It has been shown to be expressed in low amounts in kidney, prostate, endothelial cells, hepatic cells, cardiomyocytes, respiratory and digestive tract epithelium, inflamed intestinal epithelium, postpartum uterine tissue, mainly activated neutrophils. (7-9). NGAL can be considered as an acute phase protein. It has been shown by clinical studies that serum NGAL levels increase in some diseases with inflammation (10).

Serum S100A12 is a pro inflammatory protein that is found in many tissues of healthy individuals, especially in the spleen and lung, and is synthesized and stored in neutrophil granulocytes (11). It has been reported that S100A12 may be an important marker for many inflammatory diseases such as arthritis, asthma, cystic fibrosis, inflammatory bowel disease (12).

Determination of disease activity in UC is of great importance in prognosis and treatment decision. In many studies conducted to date, an ideal disease marker has been tried to be found. In recent years, noninvasive, easy and fast laboratory markers have been sought for the evaluation of disease activity and treatment response. Many clinical activity markers and noninvasive markers have been used for this purpose, but they have only provided indirect findings in the evaluation of disease activity.

In our study, we aimed to investigate the relationship of these markers with UC disease activity by examining serum S100A12 and NGAL protein levels secreted by neutrophils, which increase in the presence of inflammation.

MATERIAL AND METHOD

Study Population

Forty-one UC patients who were admitted to Canakkale Onsekiz Mart University Medical Faculty Practice and Research Hospital Gastroenterology polyclinic and Gastroenterology endoscopy unit between March 2019 and August 2020, who were endoscopically and clinically proven, during the active period of their disease, were evaluated. 7 patients were excluded from the study because they did not go into remission after 3 to 6 months of follow-up and treatment. In the control group, 31 patients

without any diagnosed chronic or acute disease who underwent colonoscopy for cancer screening or control were included in our study.

Inclusion criteria in our study; In the patient group, patients over 18 years of age, diagnosed with UC, without additional acute or chronic disease, endoscopically active and remission periods, and signed informed consent were obtained. The control group, on the other hand, was defined as patients over the age of 18, who did not have additional chronic or acute diseases, and whose signed informed consent was obtained. **Exclusion criteria in our study;** It was determined as patients under 18 years of age who did not give signed informed consent or were not qualified to give consent.

Laboratory Analyses

In addition to the demographic information of the patients included in the study, the place of involvement of the disease, the duration of the disease, its treatment, laboratory data, endoscopic and clinical disease activity indexes were prospectively recorded in the previously prepared data files. The clinical activity indices of the patients in the active period were calculated with the Truelow-Witts score. Venous blood samples were taken to analyze NGAL and S100A12 levels, as well as routine laboratory tests from UC patients and control group patients included in the study during active and remission periods. The collected venous blood was centrifuged and the serums were stored in eppendorf tubes in the -40 °C deepfreeze in the gastroenterology endoscopy unit until all of the patients were collected.

In the study, NGAL and S100A12 ELISA kits were provided by ELK Biotechnology Co. Ltd. It was determined as a Chinese brand. All analyzes were performed on a multiscan FC microplate reader (Thermo Scientific Finland).

Ethics committee approval Ethics committee approval was obtained from the Clinical Research Ethics Committee of Çanakkale 18 Mart University Faculty of Medicine, dated 12.02.2020, numbered 2011-KAEK-27/2020-E.2000005060 and numbered 03-02.

Statistical Analyses

Statistical analyzes were performed using SPSS Version 22 (IBM corporation). Continuous data were expressed as mean and standard deviation, and categorical data as numbers and percentages. The normal distribution of continuous variables was tested with the Shapiro-Wilk test. Normally distributed data were compared with Chi-Square, and non-normally distributed data were compared with Mann-Whitney U test. Trivariate continuous data were compared with the Kruskal-Wallis test. Comparisons between groups were made using Bonferroni's

correction. Chi-square and Fisher tests were used for categorical data as appropriate. Correlation analyzes were performed using Spearman correlation analysis. Prolonged hospital stay and diagnostic determinant properties of inflammatory markers in predicting the severity of ulcerative colitis were analyzed by ROC curve analysis. $p < 0.05$ was accepted as statistical significance level.

RESULTS

In our study, there were 41 patients with UC who were detected both endoscopically and clinically in the active period by the gastroenterology department of our hospital between March 2019 and August 2020. Again, with the initial mesalazine or mesalazine + immunosuppressive treatments administered by the gastroenterology department, 34 patients were considered to be in remission during their follow-up. These 34 patients admitted in remission were included in our study. The remaining 7 patients did not go into remission. One of these patients was given to surgery. 6 patients received further medical treatment. The healthy control group consisted of 31 people who applied to the internal medicine or gastroenterology department in our study, with no chronic disease and no active infection.

There were 34 patients and 31 control groups in our study. 38.2% of the patient group were female and 61.8% were male. In the control group, 32.3% were female, while 67.7% were male. While the mean age of the patient group was 47.68 ± 15.55 , the mean age of the control group was 52.45 ± 12.51 .

When serum NGAL ($p = 0.001$) and S100A12 ($p < 0.001$) levels were compared in ulcerative colitis active phase, remission and control groups, a statistically significant difference was found between the groups. In the post-hoc test, this difference was found to be higher in the active period than the serum S100A12 and NGAL levels of the patients compared to the control period and the remission period (Table 1).

The patient-based comparison of NGAL values of 34 patients with ulcerative colitis included in our study, active and remission periods, is given in detail in Figure 1.

In the study, S100A12 was found to have the highest sensitivity and specificity among the inflammatory markers used to predict active period UC (Table 2). The marker with the highest positive predictive value (PPV) and negative predictive (NPV) value was found to be serum S100A12 (75.0%, 98.2%, respectively) (Table 2). The role of serum NGAL and S100A12 in predicting active-stage UC is shown in table 2.

The ROC Curve of the role of serum NGAL, S100A12 and other inflammatory markers in predicting active-stage UC is shown in figure 3.

Table 1. Data for NGAL, S100A12, and other inflammatory markers and differences

	Active ¹ n=34	Remission ² n=34	Control ³ n=31			
	Mean $\pm$ SS	Mean $\pm$ SS	Mean $\pm$ SS	chi-square	p	post-hoc
NGAL(ng/ml)	152.26 $\pm$ 36.48	123.97 $\pm$ 37.42	123.88 $\pm$ 22.25	13.642	0.001	1>2-3
S100A12(pg/ml)	2598.17 $\pm$ 672.80	1179.55 $\pm$ 385.08	893.72 $\pm$ 209.73	67.588	<0.001	1>2>3

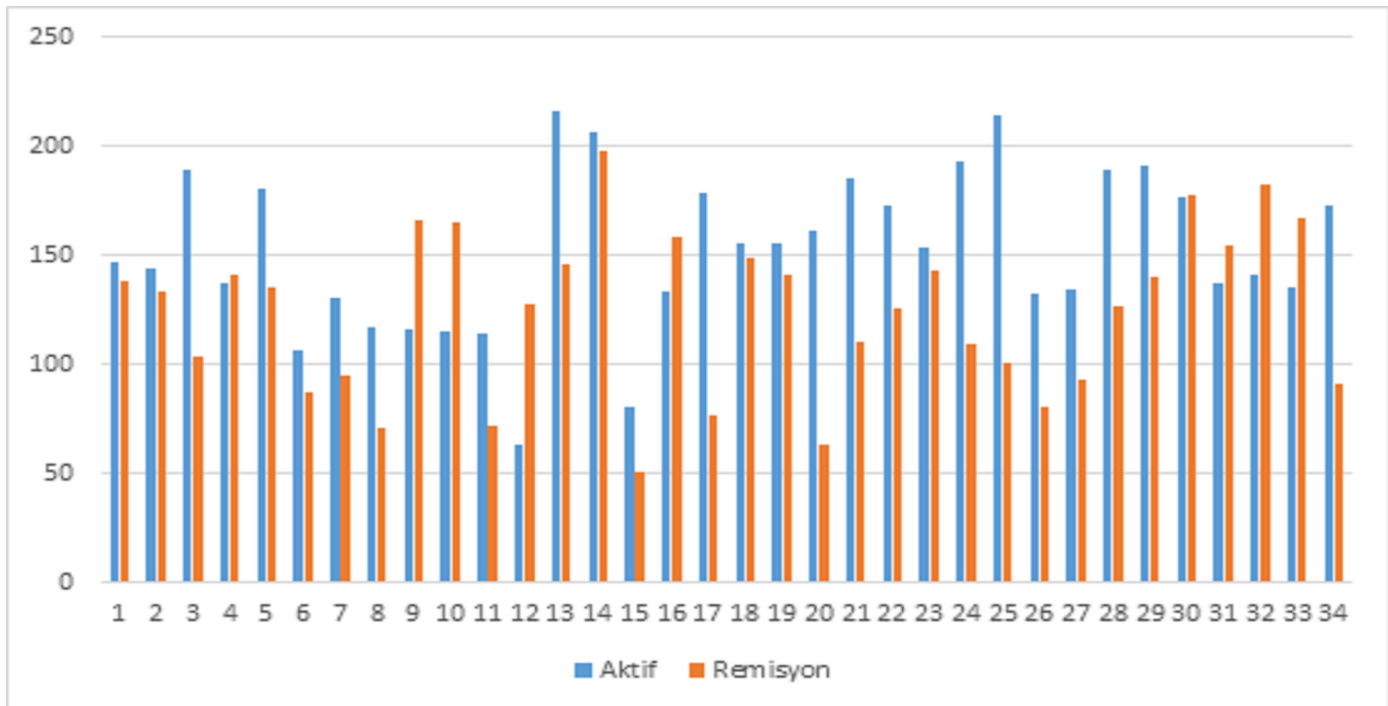


Figure 1: Patient-based UC active and remission NGAL levels

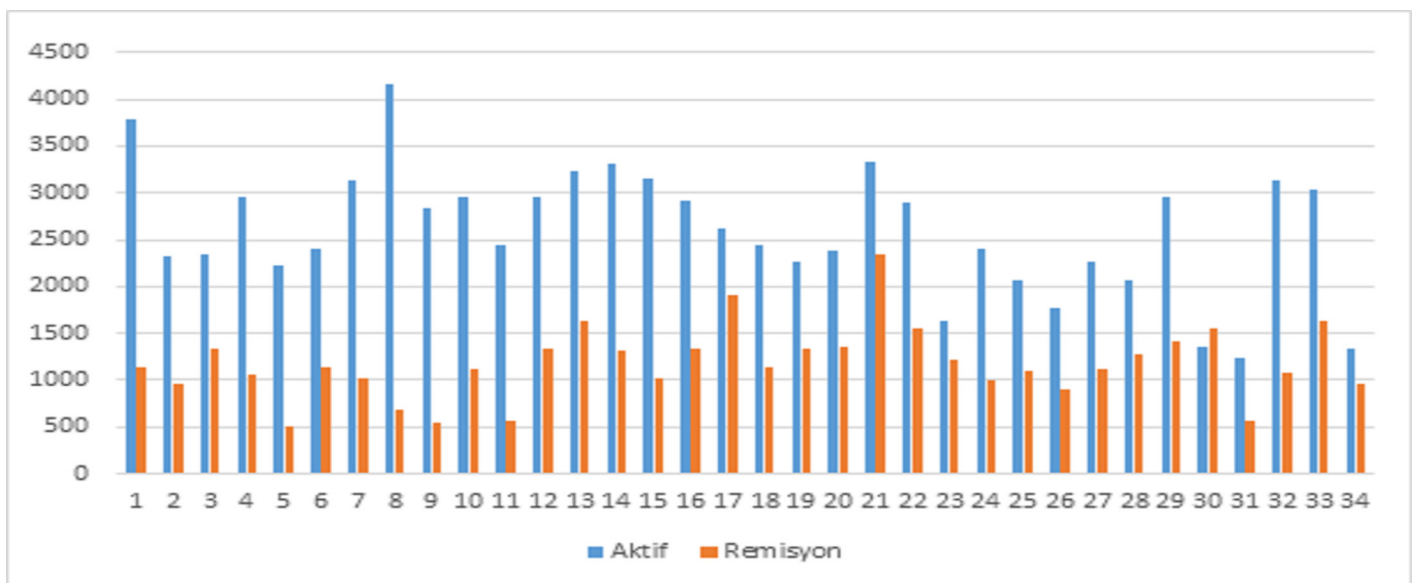


Figure 2: Patient-based UC active and remission S100A12 levels

Table 2. The role of serum NGAL, S100A12 and other inflammatory markers in predicting active-stage UC (PPV: positive predictive value, NPV: negative predictive value)

	cut-off	AUC	p	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
WBC(x1000/ml)	7500	0.671	0.005*	70.6	55.4	45.3	43.5
CRP(mg/dl)	0.30	0.660	0.009*	73.5	38.5	38.5	42.4
Ferritin(ng/ml)	61	0.611	0.071	58.8	53.8	40.0	71.4
NGAL(ng/ml)	133	0.725	<0.001*	70.6	61.5	49.0	80.0
S100A12(pg/ml)	1335	0.980	<0.001*	97.1	83.1	75.0	98.2

*:p<0.05

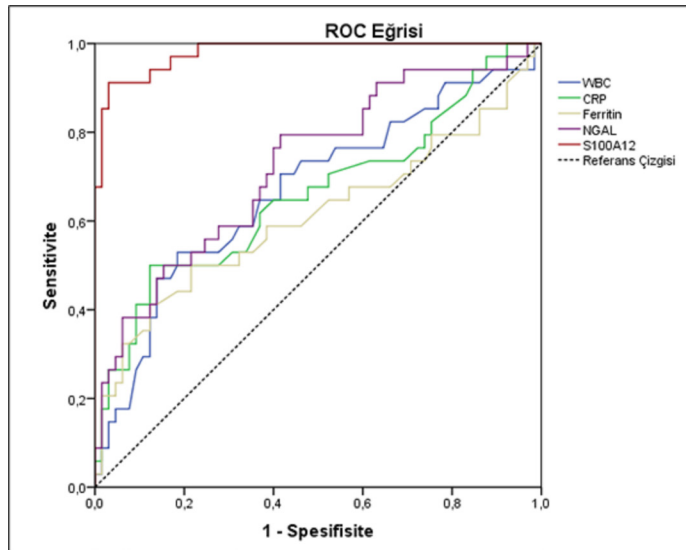


Figure 3: The role of serum NGAL, S100A12, and other inflammatory markers in predicting active-stage UC (ROC Curve)

DISCUSSION

UC is a chronic inflammatory disease that starts from the rectum, is limited to the colon mucosa, and shows uninterrupted involvement. Although the mechanism of the disease is not clearly understood, it is known that it causes mucosal inflammation and ulcers in the colon and rectum. The disease progresses with exacerbations and remissions due to the out-of-control, excessive and disproportionate reaction of the mucosal immune system (13, 14). According to an epidemiological study, the prevalence of UC is increasing steadily worldwide (15).

Some problems still remain for physicians in terms of diagnosis, prognosis, evaluation of disease severity, activity and response to treatment in IBD. There is no single gold standard test for each of these situations. A combination of clinical examination, laboratory findings, symptoms, radiology and biopsy with endoscopy is used to diagnose the disease, determine its severity, and predict treatment effectiveness (16).

Our aim is to determine the relationship between the blood levels of S100A12 and NGAL proteins secreted from neutrophils and the disease activity in active and remission UC patients determined by clinical and endoscopic indices, and to reveal a marker that is specific to the disease and can be considered as an activity indicator.

NGAL is normally produced as a component of the late granules of neutrophils and is specifically synthesized from cells under stress (17). In the studies performed, malignant tumors originating from various organs including breast, endometrium, ovary, skin, thyroid, lung, colon, liver, biliary tract, stomach, esophagus and pancreas; It has been shown that NGAL expression increases in body fluids and related tissues in conditions such as infection, inflammation, burns, ischemia, heart and kidney damage (18). NGAL is a pro inflammatory molecule. Granulocyte accumulation is seen in the inflamed area. Secretory granules containing NGAL are released after apoptosis of granulocytes and mediate local tissue damage. After intraperitoneal injection of *Escherichia Coli*, serum and liver NGAL levels increased within 4 hours, and spleen NGAL levels increased within 6 hours,

indicating that NGAL is an important acute phase protein (18).

In a study by Thorsvik S. et al., NGAL was strongly increased in active Crohn's disease of the small intestine, possibly due to increased expression in intestinal epithelial cells other than Paneth cells. This increase underlines the putative role of NGAL as a fecal biomarker of inflammation in the small intestine (19).

The S100 proteins are small, acidic, calcium-binding proteins with the "EF-hand" conformation. At least 25 types of S100 proteins have been identified in humans to date (20). Among them, the extracellular S100A12 protein (EN-RAGE, Calgranulin C) activates the NF- κ B pathway and leads to increased expression of pro inflammatory cytokines such as IL-1 β and TNF, and adhesion molecules such as vascular cell adhesion protein 1 and intercellular adhesion molecule 1 (21).

Recently, it has been shown that S100A12 is secreted by activated human neutrophils (22). S100A12 also cystic fibrosis (measured in bronchial fluid) (23) It is elevated in diseases with a number of inflammatory sub pathogenesis, including rheumatoid arthritis (serum) (24) and IBD (serum, mucosa, and stool) (25).

Blood levels of S100A12 are elevated in patients with diabetes and have also been shown to be a good biomarker for the detection of other inflammatory diseases such as systemic juvenile idiopathic arthritis (26,27).

Since migration and infiltration of neutrophils into inflamed tissue plays a crucial role during the inflammatory process of UC, we evaluated the serum relevance of S100A12 in UC. In our study, we found that S100A12 was statistically significantly higher in the active period compared to the control and remission periods. In our study, we found that S100A12 has high sensitivity and specificity in active-stage UC patients. These data suggest that S100A12 can be used as an active-stage disease inflammatory marker of UC. Neutrophil influx into the intestinal mucosa is strongly associated with neutrophil-derived S100A12 inflammatory activity in tissue and secretions, particularly in the early stages of inflammation, as it is closely linked to IBD activity (25,28).

In a study by Foell et al., S100A12 neutrophil count is more sensitive in showing the subclinical activity of auto inflammatory diseases compared to other inflammatory markers such as CRP, ESR and fibrinogen (21). In our study, it was observed that the sensitivity and specificity of S100A12 were higher than ESR, CRP, ferritin and WBC. Again, Foel et al. succeeded in demonstrating, for the first time, tissue-level S100A12 expression in adults with IBD. In this study, tissue expression of S100A12 in the colonic mucosa of individuals with CD and UC, as well as serum S100A12 levels were examined and it was shown that S100A12 is at high levels in the colon mucosa and serum containing inflammation. In the same study, S100A12 levels were also found to be correlated with clinical indicators of disease activity (25).

Fecal S100A12 levels also correlate with inflammation. In a study by Kaiser et al., fecal S100A12 was shown to have 86% sensitivity and 96% specificity in differentiating inflammatory bowel disease from non-organic diseases such as irritable bowel syndrome (29).

Determination of disease activity is of great importance in terms of treatment decision and prognosis. In our study, we found that WBC, neutrophil and ESR levels, which are classical inflammation markers, were statistically significant and higher than the control group during the activation period. Although we know that these markers are not disease specific and cannot be an indicator of activation alone, it is obvious that they can guide the clinician when there is clinical doubt. CRP levels, another classical activation indicator, were found to be statistically significant and higher in the active period of UC compared to the remission period. In other studies, there is generally a positive correlation between classical laboratory tests such as ESR, CRP, WBC, platelet and disease activity. Especially, serum CRP levels can be considered as a nonspecific indicator of inflammation, which increases significantly during the attack period in UC patients (30).

Evaluation of UC disease activity; The regulation of the treatment, the evaluation of the response to the treatment are of great importance in terms of predicting the patients at risk of relapse, who may go into remission or who will require colectomy. Various indices developed by Powell-Tuck, Seo, Truelove-Witts and Mayo Clinic are used to evaluate clinical activity. The Truelove-Witts criteria are a frequently used scoring system in clinical practice for easy recall. However, the disadvantage of this system is that the patient's colonoscopic findings were not included in the evaluation (31).

We classified the active period of UC as mild activation, moderate activation and severe activation group according to Truelove-Witts. According to Truelove-Witts, when the relationship between mild-moderate-severe groups with serum NGAL and S100A12 was examined, no statistically significant difference was found between them. We think that this is due to the low number of active patients.

The limitations of our study can be listed as the low number of active UC patients in our study, the single-center conduct of our study, the inability to examine urine and feces NGAL and S100A12 levels, and the inability to examine the expression levels of these markers in the mucosal tissue.

CONCLUSION

In our study, we evaluated the relationship of serum NGAL and S100A12 levels with disease activity in clinically and endoscopically determined UC active and remission patient groups. In the literature, no study was found in which serum NGAL and S100A12 were evaluated together in UC patients. In our study, serum NGAL and S100A12 levels were found to be statistically significantly higher in the active UC patient group than in the remission and control groups. In addition, serum NGAL and S100A12 levels were found to have high sensitivity and specificity in the active patient group with UC. This suggests that serum NGAL and S100A12 levels may be an important marker in the detection of UC activation. Although this situation suggests that serum NGAL and S100A12 cannot be a marker to be used in the evaluation of the severity of UC active disease, we predict that this situation may be due to the insufficient number of active UC patients included in the study.

We can say that in order for the findings of our study, which

has high specificity, to be included in the literature in the long term, it should be supported by multicenter, prospective studies that also show NGAL and S100A12 tissue expression, including more patients and control groups.

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[OP-4]

Evaluation of Existence of Depression or Anxiety Symptoms in Patients with Bilateral Cataract

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AimTo evaluate if patients with bilateral cataract are likely to have depression or anxiety symptoms.

Material and Methods: Twenty patients over the age 60 who were diagnosed as having senile cataract in both eyes were included in the study. All patients completed the 'Hospital Anxiety and Depression Scale (HADS)' questionnaire which was used to determine the severity of anxiety and depression.

Results: The patients' average age was 68.25 ± 6.23 (60-81). There were 10 (50%) men and 10 (50%) women. According to the HAD scale, among 20 patients, 8 (40%) patients were detected as having moderate or severe depressive symptoms and 6 (30%) patients were detected as having moderate or severe anxiety symptoms. The overall result of these patients was 9.95 ± 4.4 (4-17) in depression subscale and 11.4 ± 4.8 (5-19) in anxiety subscale.

Conclusions: In our study, patients who were diagnosed with bilateral senile cataracts, had moderate and severe depressive and anxiety related symptoms. Therefore, ophthalmologists should be aware of the tendency for senile cataract patients to suffer from depression or anxiety, consider screening these patients for symptoms, and referring them for counseling. Similarly, psychiatrists could ask patients with depression and/or anxiety about their visual acuity conditions and refer them to an ophthalmologist to plan a timely surgery for cataract if needed.

Keywords: Anxiety, cataract, depression

INTRODUCTION

Senile cataract is a leading cause of visual impairment throughout the world, longer life expectancies and rise in aging population increases the prevalence (1).

On the other hand, the most common psychiatric disorders in elderly population, with the exception of dementia, are depression and anxiety. They can be easily underdiagnosed or accepted as a natural part of aging due to comorbid diseases and can lead to compromise in life quality in elderly population (2).

The Hospital Anxiety and Depression Scale (HADS) is an useful instrument for evaluating anxiety and depression in older people (3). The scale contains 14 items: half of them assess anxiety and the other half assess depression related symptoms. The anxiety subscale specificity is 0.78 and the sensitivity is 0.9. The depression subscale specificity is 0.79 and the sensitivity is 0.83 (4).

The relationship between vision impairment due to cataract and depression and anxiety in older adults was found to be significant in several studies (5,6).

In this study, our aim is to evaluate if patients with bilateral cataract are likely to have depression or anxiety symptoms.

MATERIAL AND METHODS

Twenty patients over the age 60 who were diagnosed with senile cataracts in both eyes were included in the study. Participants with any disease or taking any medication which could impact the psychological evaluation or ophthalmological examination, and patients with previous ophthalmologic surgery history, were

excluded. The comprehensive ophthalmological examination including a slit-lamp examination was performed on both eyes to evaluate the presence of senile cataracts.

All patients completed the Hospital Anxiety and Depression Scale (HADS) questionnaire which determines anxiety and depression symptoms based on 14 items: half of which assess anxiety and half which assess depression. The score can be evaluated as follows: 0-7 – no depression or anxiety; 8-10 – mild depression or anxiety; 11-14 – moderate depression or anxiety; and 15-21 – severe depression or anxiety (4). Each patients' score was recorded and evaluated. Each subject provided written informed consent.

RESULTS

The average age of the patients was 68.25 ± 6.23 (range 60-81). There were 10 (50%) men and 10 (50%) women.

According to the HAD scale, among 20 patients, 6 patients were detected as having mild depression symptoms, 2 moderate and 6 severe. Also among 20 patients, 5 patients were detected as having mild anxiety symptoms, 2 moderate and 4 severe. The overall result of these patients were 9.95 ± 4.4 (4-17) in depression subscale and 11.4 ± 4.8 (5-19) in anxiety subscale.

DISCUSSION

In our study, in patients who are 60 years or older, diagnosed with bilateral senile cataracts, high HAD scale scores were detected which suggests a propensity towards depression and anxiety. Previous studies had similar findings. In a study by Wang et al (5), Chinese over 60 years old diagnosed with senile cataracts were found have more depressive symptoms than those without

cataracts. Another study by Eramudugolla (6), found that patients over 70 years had anxiety and depression symptoms associated with cataract. Palagyi et al (7) also reported that high prevalence of depressive symptoms existed in older people diagnosed with senile cataracts. In a study by Zhang et al, (8) the rates of anxiety and depression in cataract affected people was 18%, compared to rates of 7% and 5.2% for anxiety and depression for healthy persons.

The exact relationship between cataracts, depression and anxiety remains unclear, however visual impairment due to senile cataracts is likely to negatively impact patient's daily activities including their physical and intellectual activities, such as reading or communicating with other people, causing individual isolation and potentially leading to depression (5). Although cataract surgery is a safe procedure which is usually successful, the fear of surgery can be one of the factors leading to anxiety amongst patients. The progressive nature of the disease, decrease in visual acuity, and fear of being blind, may also explain the high levels of depression and anxiety in our study.

In a study by Ahn et al (9), a neurobiological perspective was proposed. They reported that patients with cataracts have decreased light input due to the opacity of their lens. This decreased light input might have a negative impact on the suprachiasmatic nucleus in the hypothalamus which is responsible for the sleep cycle and some serotonergic functions. In the same study, it was suggested that cataracts cause shortened sleep duration and reduced sleep quality, which may trigger depressive or anxiety symptoms.

In Wang et al's study (5) the reduction in visual acuity was not the only factor which was related to depressive or anxiety related symptoms. They reported that other factors due to the cataract formation such as halos, light adaptation and contrast changes could possibly play a role in developing depressive or anxiety related symptoms.

In conclusion, ophthalmologists should be aware of the tendency amongst senile cataract patients to depression or anxiety and maybe consider screening these patients for these symptoms and consider

referring for counseling. The findings also emphasize the necessity of timely cataract surgery in order to prevent the risk of these psychological symptoms. In addition, psychiatrists could ask their patients about their visual acuity condition and refer them to an ophthalmologist in order to plan a timely surgery for cataract.

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[OP-5]

Evaluation of Dry Eye in Eyes with Unilateral Pterygium

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Aim: To determine if eyes with unilateral pterygium are more likely to suffer from dry eye when compared to healthy fellow eye

Material and Methods: Forty eyes of 20 patients were enrolled. The eyes that were diagnosed as pterygium were considered as Group 1 and the other healthy eyes of the same patients were defined as Group 2. The existence of dry eye was tested with tear film break-up time, Schirmer-1 test, Oxford scale and Ocular Surface Disease Index (OSDI) score assessments.

Results: Median tear film break up-time measurement and Schirmer 1 value were lower in Group 1 however no statistically significant difference was detected. ($p=0.06$, $p=0.308$ respectively) Median OSDI score and median Oxford scale score were higher in Group 1 however no statistically significant difference was detected ($p=0.05$, $p=0.250$, respectively).

Conclusions: Between eyes with pterygium and those which were healthy, there were differences in the results of dry eye tests. These results may show that there might be a relationship between pterygium and dry eye disease regardless of the genetic background and environmental factors.

Keywords: Dry eye, pterygium, ocular surface

INTRODUCTION

Pterygium is common disease of ocular surface which is characterized by subconjunctival fibroblast activation resulting conjunctival tissue invasion onto the cornea. Although the exact mechanism in developing pterygium is not clear, ultraviolet (UV) light exposure is considered to be the main risk factor. (1) UV light is believed to cause oxidative stress and activate inflammatory pathways and release of growth factors which play a crucial role in pterygium pathogenesis. (2) Pterygium is usually seen as a unilateral condition. The main risk factor, UV exposure has an impact on both eyes so there might be other contributing factors in development of pterygium.

Tear film is one of the protective mechanisms of the eye against harmful environmental situations such as UV exposure. (3) In development of UV related ophthalmologic diseases such as pterygium, the abnormalities in tear film layer could be one of the possible reasons.

The aim of this study is to evaluate the dry eye existence in patients with pterygium and to compare these findings with healthy eyes of these patients.

Materials and Methods

Forty eyes of 20 patients who were diagnosed with unilateral pterygium were included. Patients with any medical history of any other ophthalmic diseases or surgeries or patients with pre-existing dry eye disease or ocular surface disease or patients using any kind of topical drugs were excluded. The eyes that were diagnosed as pterygium were considered as Group 1 and the other healthy eyes of the same patients

were defined as Group 2. All subjects included, underwent a detailed ophthalmological examination. Dry eye tests were also performed on both eyes including tear film break-up time (T-BUT), Schirmer 1 test, corneal and conjunctival fluorescein staining and Oxford scoring, Ocular Surface Disease Index (OSDI) score assessment. Each subject provided written informed consent. For statistical purposes 'IBM The Statistical Package for the Social Sciences 25' was used.

Results

The median age of the patients was 51.00 ± 8.1 (range 35-65) years. There were 9 (45%) men and 11 (55%) women. Group 1's median Schirmer 1 value was 19.0 ± 6.6 (range, 5-30) and Group 2's was 20.0 ± 5.7 (range, 8-35) mm, ($p=0.308$). Group 1's median T-BUT value was 8.0 ± 4.6 (range, 3-16) and Group 2's was 12.5 ± 3.3 (range, 7-18) seconds, ($p=0.06$). Group 1's median Oxford scale (superficial punctate staining of the cornea and conjunctiva) was 0.5 ± 0.7 (range, 0-2) and Group 2's was 0.0 ± 0.5 (range, 0-2), ($p=0.250$). Group 1's median OSDI score was 36.4 ± 31.4 (range, 4.1-87.5) and Group 2's was 17.6 ± 17.0 (range, 4.1-72.9), ($p=0.05$).

Discussion

Pterygium is a common disease with unilateral presentation generally. The main responsible factor in etiopathogenesis is UV light exposure (1) which leads to oxidative stress and limbal damage. However, people living in the same environment and exposed to the same amount of UV light do not develop pterygium. (4) Even in an individual patient, although both eyes are exposed to UV light in the same amount and both eyes have the same genetic predisposition,

pterygium usually develops unilaterally. (5) These findings bring questions about existence of other etiological factors in development of pterygium.

Tear film is one of the protective mechanisms of the eye against harmful environmental situations, such as UV exposure. (5) In development of UV related ophthalmologic diseases such as pterygium, the abnormalities in tear film layer could one of the possible reasons. In our study in eyes with pterygium, the median T-BUT measurements were found to be lower and median OSDI scores were found to be higher in Group 1 and the difference was not statistically significant. The median Schirmer-1 test measurements were lower and the median Oxford score results were higher in Group 1 however, the differences were not statistically significant.

Ishioka et al, (5) were also evaluated the dry eye test results in unilateral pterygium patients and compared the results with fellow eye like our study. They found lower T-BUT values in eyes with pterygium. Also Özsütçü et al (6) investigated the dry eye existence with T-BUT and Schirmer test in unilateral pterygium and they reported significant reduction in both dry eye tests in eyes with pterygium. In another study by Ye et al (7) median OSDI score in patients with pterygium were found to be significantly higher when compared to healthy individuals.

Chronic inflammatory nature of both pterygium and dry eye could make these diseases trigger each other. The secretion of proinflammatory cytokines and the release of MMP's in dry eye disease may trigger fibroblasts which develops pterygium (8) and also MMP-9 was shown to correlate with pterygium formation. (9)

Also the loss of regularity that pterygium growth causes, can lead to local inflammatory conditions which increase the release of inflammatory cytokines and due to the elevated inflammatory status, some changes in Meibomian gland can occur and as a result evaporation can result in abnormalities in tear film layer resulting dry eye disease. (10)

As a conclusion, in this study, we found changes in dry eye test results in eyes with pterygium when compared to fellow eyes of the same patient without pterygium. These results may show that there might be a relationship between pterygium and dry eye disease regardless of the genetic background and

environmental factors. However, whether pterygium causes dry eye disease or dry eye disease led to pterygium remains unclear. Further investigations are needed to explain the common etiology and the exact relationship between these two diseases.

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[OP-6]

Evaluation of The Relationship Between Dry Eye and Cataract Surgery

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Aim: The aim of this study is to evaluate the presence of dry eye in patients who had cataract surgery within 3 months and comparing the results with other healthy eyes of the patients.

Material and Methods: 20 patients were enrolled and both their eyes were examined. The eyes that had cataract surgery within 3 months were considered as Group 1 and the other healthy eyes of the same patients were defined as Group 2. The existence of dry eye was tested with tear film break-up time, Schirmer-1 test, Oxford scale and Ocular Surface Disease Index (OSDI) score assessments.

Results: Median tear film break up-time measurement was lower and the difference was statistically significant ($p=0.037$). Median OSDI and Oxford scale scores were higher in Group 1 and median Schirmer 1 value was lower in Group 1 however no statistically significant difference was detected. ($p=0.063$ $p=0.545$, $p=0.825$, respectively).

Conclusions: Between eyes with prior cataract surgery and those which were healthy, there were significant differences in the results of dry eye tests. It is essential that ophthalmic surgeons be aware that cataract surgery can trigger dryness of the ocular surface and to promptly start treatment to prevent detrimental effects.

Keywords: Dry eye, cataract, cataract surgery

INTRODUCTION

Dry eye is a multifactorial disease of the ocular surface which can result in ocular discomfort, tear film instability and eventually ocular surface damage. (1) Ocular symptoms related to dry eye includes pain, irritation, decrease in vision and tearing.

Cataract is another common disease of the eye and can be treated with phacoemulsification surgery which is performed worldwide and includes small incision and emulsification of the crystalline lens with ultrasonic force (2).

With the widespread use of phacoemulsification surgery, the development of dry eye related symptoms after surgery has increased gradually and is becoming of interest to ophthalmologists (3). The reported prevalence of dry eye following cataract surgery ranges from 8% (4) to 70% (5).

The aim of this study is to evaluate the existence of dry eye in patients who had cataract surgery comparing their eyes which had undergone surgery with those which had not.

Materials and Methods

Twenty patients were enrolled in the study. Patients who had cataract surgery within 3 months in one eye were included. Patients with any ophthalmologic or systemic diseases, patients with pre-existing ocular surface disease and patients had cataract surgery of both eyes were excluded. The eyes that had cataract surgery within 3 months were considered as Group 1 and the other healthy eyes of the same patients were defined as Group 2. All subjects underwent a detailed ophthalmological examination. Dry eye tests were performed on both eyes including tear film break-up time (T-BUT), Schirmer 1 test, corneal and conjunctival fluorescein staining and Oxford scoring, Ocular Surface Disease Index (OSDI) score assessment. Each subject provided written informed consent. For statistical purposes 'IBM The Statistical Package for the Social Sciences 25' was used.

Results

The median age of the patients was 66.5 ± 7.9 (range 54-78). There were 11 (55%) men and 9 (45%) women. Group 1's median Schirmer 1 value was 17.0 ± 7.0 (range, 10-30) and Group 2's was 20.0 ± 6.9 (range, 10-30) mm, ($p=0.825$). Group 1's median T-BUT value was 10.0 ± 3.9 (range, 3-16) and Group 2's was 13.0 ± 3.8 (range, 6-18) seconds, ($p=0.037$). Group 1's median Oxford scale (superficial punctate staining of the cornea and conjunctiva) was 0.00 ± 0.68 (range, 0-2) and Group 2's was 0.00 ± 0.67 (range, 0-2), ($p=0.545$). Group 1's median OSDI score was 25.0 ± 30.3 (range, 8.3-93.7) and Group 2's was 17.65 ± 20.7 (range, 4.1-66.6), ($p=0.063$).

Discussion

The relationship between cataract surgery and dry eye disease has been evaluated by many researchers. Ishrat et al (6) reported clinical signs of dry eye disease in 9% of the patients 1 month after surgery however Miyake and Yokoi (7) documented it in 31% of patients after one month. Dasgupta and Gupta (8) found that 3 months after surgery, 100% of patients showed abnormalities in T-BUT, Schirmer 1 tests and dry eye symptoms. In addition to these findings Choi et al. (9) reported that at 3 months, 27% of patients suffered from dry eye. Iglesias et al (10) was reported that after cataract surgery, 32% of the patients continued suffering from dry eye symptoms until 6 months. Oh et al. (11) also found a significant reduction in T-BUT in the post-operative period of the cataract surgery however Schirmer Test 1 was within normal range. In addition to these finding they also reported that, even 3 months post-operatively, both T-BUT and Schirmer Test 1 values showed improvement, however both of them remained lower than the baseline.

It is well known that, in development of dry eye disease, inflammation plays a crucial role (12). It was shown that during the cataract surgery, brutal ocular surface irritation can stimulate

inflammatory responses by the production of free radicals, proteolytic enzymes, and cyclooxygenase (13,14). These components can irritate and damage the ocular surface and may lead to tear film abnormalities and dry eye disease.

The damage of the corneal nerves can cause dry eye after cataract surgery. Both the mechanical impact of the incisions and the neurogenic inflammation resulting in alterations in the action of the corneal nerves and reduce in corneal sensitivity (15) could be contributing factors.

The use of drops with preservations such as benzalkonium chloride during and after the surgery could contribute to dry eye after cataract surgery. Li et al. (16) reported that 3 months after cataract surgery a decrease in the number of goblet cells were detected and they also suggested that peri-operative use of eye drops is the major factor responsible. Jee et al. (17) evaluated the affect of preservatives on patients with cataract surgery. They found that two months after the surgery, patients who received preservative-free drops had better T-BUTs, goblet cell counts, Schirmer I test, corneal fluorescein staining and OSDI questionnaire scores.

In a study by Han et al (18), the relationship between Meibomian gland dysfunction and cataract surgery was evaluated and they suggested that cataract surgery seems to effect the function of the Meibomian glands. Also they emphasized that these changes of the Meibomian glands remained until 3 months post-operatively, suggesting that Meibomian gland dysfunction and tear film instability may be the leading factors of persistent dry eye symptoms after cataract surgery.

During cataract surgery, the ocular surface' exposure to repeated cycles of drying and irrigation could potentially harm the ocular surface and contribute to development of dry eye. He et al. (19) reported that cataract surgery with the use of hydroxypropyl methylcellulose for coating the surface resulted in better tear film assessment measures when compared with balanced salt solution irrigation.

In a study by Cho et al (20), the duration of microscopic light exposure during cataract surgery was associated with worse dry eye symptoms, T-BUT and Schirmer I test in patients with no prior history of dry eyes.

In conclusion, factors that can contribute to the development of dry eye after cataract surgery include preservatives in eye drops that are used during and after surgery, decreased corneal sensation due to surgical incision, surgically induced ocular inflammation, damage in Meibomian gland functions and surgical factors such as irrigation, exposure to light from the operating microscope.

In our study we found significant differences between eyes with prior cataract surgery and those which were healthy, in the results of dry eye tests.

In summary, it is essential that ophthalmic surgeons be aware that cataract surgery can trigger the development of dryness of the ocular surface and to promptly start treatment to prevent the detrimental effects.

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[OP-7]

Evaluation of Dry Eye Symptoms and Existence in Internet Gaming Disorder

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Aim: The purpose of this study is to determine whether individuals who score higher on the internet gaming disorder questionnaire are more likely to suffer from dry eye symptoms compared to healthy individuals with no habit of internet gaming.

Material and Methods: Patients between 18-40 years old, who applied to Buca Seyfi Demirsoy Training and Research Hospital, Department of Ophthalmology, for a routine examination were requested to complete the 'The Internet Gaming Disorder Scale 9-Short Form'. Individuals who scored higher than 20 were invited to enrol in the study. The existence of dry eye was tested with tear film break-up time, Oxford scale and Ocular Surface Disease Index (OSDI) score assessments. The results of twenty left eyes of 20 patients with score greater than 20 in the scale and 20 left eyes of 20 age and sex matched healthy individuals who had no habit of internet gaming were compared.

Results: Among dry eye tests, median T-BUT values were lower and the median OSDI scores were higher in individuals with a high score in the 'Internet Gaming Disorder Scale', and the differences were statistically significant ($P = 0.008$, $P < 0.001$ respectively).

Conclusions: The great amount of time that persons with internet gaming disorder spend viewing computer screens, together with the concentration and attention they generally exert when playing an internet game, increases the evaporation from the ocular surface. It is important for psychiatrists and ophthalmologists to be aware of this relationship and take proper precautions to prevent the serious consequences of dry eye disease on the ocular surface.

Keywords: Dry eye, internet gaming disorder, ocular surface

INTRODUCTION

Gaming has been growing as a popular entertainment tool: 43% of adults and 90% of teenagers in the United States report playing video games (1). Individuals who regularly play internet games can be preoccupied with gaming, can have withdrawal and/or tolerance symptoms, and can lose interest in other daily activities. The American Psychiatric Association included 'Internet gaming disorder (IGD)' in the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (2). The Internet Gaming Disorder Scale 9-Short Form was the first brief standardized psychometric tool to assess Internet Gaming Disorder (IGD) based on nine Internet Gaming Disorder criteria suggested by the American Psychiatric Association in the latest edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Each item rated on a five-point scale (1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat agree, and 4 = agree 5=strongly agree). The higher scores indicate the exhibition of more addiction symptoms (3).

Dry eye is a multifactorial disease characterized by tear film instability and ocular surface inflammation and can result in ocular surface damage (4). Dry eye symptoms can vary widely however the symptoms, including pain, tearing, redness and fatigue, can decrease life quality seriously (5). Therefore, it is important to understand the underlying causes of dry eye to prevent them. The etiology of is multifactorial, combining the intrinsic factors such as age, gender, ocular or systemic diseases and extrinsic factors such as contact lens wear and environmental

conditions, medications (6). Recently, a leading extrinsic risk is considered to be digital screen use (7). According to a recent metaanalysis, the prevalence of dry eye in individuals who use digital screens ranged from 9.5% to 87.5% (8). In a study by Sánchez-Valerio et al (9) 79.6% of computer users had symptoms of dry eye disease, the tear film stability was altered in 97.2% and 44.4% of the subjects showed ocular surface damage.

The purpose of this study is to determine whether individuals with greater scores in the internet gaming disorder questionnaire are more likely to suffer from dry eye symptoms in comparison to healthy individuals with no habit of internet gaming.

Materials and Methods

The patients between 18-40 years old, who applied to Buca Seyfi Demirsoy Training and Research Hospital Department of Ophthalmology for routine examinations were asked to complete 'The Internet Gaming Disorder Scale 9-Short Form'. Among the patients who completed the questionnaire, those who had scores higher than 20 were enrolled in the study. Patients who had any systemic or ophthalmological diseases that might effect dry eye parameters or patients using topical drugs and patients with other psychological disorders were excluded. In addition to undergoing a detailed ophthalmological examination, the presence of dry eye was evaluated with ocular surface staining (Oxford scale scoring), tear film breakup time (T-BUT) and Ocular Surface Disease Index (OSDI) score assessment. Each subject provided written informed consent. For statistical purposes 'IBM The Statistical Package for the Social Sciences version 25' was used.

The results of twenty left eyes of 20 patients with score higher than 15 in 'The Internet Gaming Disorder Scale 9-Short Form' (group 1) and 20 left eyes of 20 age- and sex-matched individuals whose score was less than 15 (group 2) were compared.

Results

The median ages of group 1 and group 2 were 25.50 ± 5.69 (range, 18–36) and 26.50 ± 5.01 years (range, 18–32), respectively ($P = 0.841$).

Median T-BUT measurements of group 1 and group 2 were 10.00 ± 3.27 (4–15) and 12.00 ± 4.09 (5–19) seconds, respectively ($P = 0.008$). The median OSDI scores in group 1 and group 2 were 52.00 ± 29.57 (8.3–93.7) and 14.50 ± 21.69 (4.1–71.9) respectively ($P < 0.001$). The median Oxford scale scores according to superficial punctate staining of the cornea and conjunctiva in group 1 and group 2 were 0.00 ± 0.47 (0–1) and 0.00 ± 0.44 (0–1), respectively ($P = 0.799$). Among dry eye tests, the median T-BUT value was lower and the median OSDI score was higher in group 1, and the differences were statistically significant ($P = 0.008$, $P < 0.001$, respectively).

Discussion

In our study, in patients with greater Internet Gaming Disorder Scale 9-Short Form scores, the median T-BUT value was significantly lower and median OSDI score was significantly higher. Although not statistically significant, Oxford score results were higher in these patients when compared to individuals with no habit of internet gaming.

The affect of digital screen use on the ocular surface and linkage to dry eye disease was evaluated in previous studies. In a study by Akkaya et al (10) it was shown that long-term computer use caused instability in the tear film layer which leads to increased evaporation. In that study T-BUT were found to be significantly lower in the group using computers compared to the control group. In a large study of office workers, severe dry eye symptoms were detected and significantly higher among those who used digital screens for >4 hours per day (11).

In another study Wu et al (12) found that dry eye patients who worked with digital screens for a long time had shorter T-BUT values, higher corneal fluorescein staining, and higher OSDI scores than dry eye patients with less digital screens exposure. These findings therefore show a significant relationship between dry eye disease and digital screen use.

A major contributing factor leading to dry eye disease in persons with prolonged digital screen use is increased evaporation and the main reason for increased evaporation can be explained by the reduction in the number of blinks and increase in incomplete blinking (13). Blinking is an important factor in distribution of tear film to the ocular surface (14).

In previous studies it was shown that digital devices use can affect blink patterns which can lead to increase in evaporation and cause impairment in ocular surface homeostasis and tear film function (15,16). This situation can contribute to ocular discomfort symptoms like grittiness, burning, stinging etc. Reduced blink rate was reported with digital screen use in different studies (17,18).

It is well known that patients with internet gaming disorder spend more time with digital screens and the nature of 'gaming' requires concentration and attention. It was suggested in a study that longer inter-blink intervals occurred with internet games when compared to non-computer activity (19). Also reduced blink rate was found with computer games when compared to watching a movie (20). Acosta et al (19) found that the blink rate was reduced to about 42% of the when participants played a computer game compared to when the same patients were not looking at devices or were resting. The blink rate returned to the rest levels when participants stopped playing the game. Cardona et al (21) also reported that the percentage of incomplete blinks increased during video-game playing.

In conclusion, internet gaming disorder has started to be considered a common disorder amongst youth for whom digital screen use is part of everyday life. The great amount of time spent looking at digital screens for those with internet gaming disorder, in addition to the requirements of concentration and attention when playing, increases the evaporation from the ocular surface due to the reduced blink rate and increased incomplete blinks. This situation can lead to ocular surface inflammation and dryness which may possibly develop dry eye symptoms and ocular discomfort. It is important for both psychiatrists and ophthalmologists to be aware of this relationship and start appropriate treatment when necessary to prevent serious consequences of dry eye disease on the ocular surface.

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[OP-8]

Can Intraabdominal Esophageal Length Measurement Predict Gastroesophageal Reflux in Childhood Caustic Esophageal Strictures?

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AimIn childhood age group, caustic esophageal burn remains an important health issue in developing countries. In this study, we aimed to investigate the development of shortening of the intra-abdominal esophageal segment (IES) in children with caustic esophageal stenosis and to investigate the relationship between IES shortening and gastroesophageal reflux disease (GERD).

Material and Methods: Between January-2012 and January-2013, 16 children who were followed up in a pediatric surgery center in Turkey for caustic substance intake were included in the study. At the admission to hospital, all patients were evaluated for esophageal burn grading by esophagoscopy. The IES length was demonstrated by ultrasonography (USG) at the admission and 3rd month of ingestion of the substance. Esophageal stricture was explored at the 3rd week by esophagus-stomach-duodenum radiography. 24-hour-pH monitoring was performed for GERD at the 3rd month of intake of corrosive material.

Results: Nine (56 %) patients of the study group were male. Mean age was 5.06±4.95 years. Grade-1 caustic esophageal burn was detected in 3 (19%) patients, grade-2a in 4 (25 %) patients and grade-2b in 9 (56 %) patients. Esophageal stricture was detected in the esophagoscopy of 3 patients with grade-2b burns, and the IES length of them was found to be shortened in the 3rd month. GERD was detected in 1 of them in 24-hour-pH monitoring. There was no significant relationship between IES length shortening and GERD.

Conclusions: The presence of caustic esophageal stricture is a risk factor for GERD. In these patients, exploring shortening of the IES length with USG might be helpful for prediction of GERD. By this way, short and long-term complications of caustic burns can be avoided by early diagnosis and treatment.

Keywords: Gastroesophageal reflux, esophageal stricture, caustic burn

INTRODUCTION

Accidental caustic substance injury (CSI) remains a serious public health issue in young children. Despite legal modifications in the allowable concentrations of many household cleaners, caustic agents continue to be accidentally ingested in particularly developing countries (1). The management strategy after ingestion should be programmed according to the existing clinical signs and symptoms (2). An early upper gastrointestinal system endoscopy is the main procedure in order to assess the affected esophageal mucosal portion and grading of corrosive esophageal injury in patients suffering from CSI (3,4). Depending on acute gastrointestinal mucosal damage, common sequelae including stricture formation, perforation, and hemorrhage are important and frequently life-threatening health problems in these patients (1-3). Furthermore, the incidence of adenocarcinoma and squamous-cell carcinoma of the esophagus among patients with stricture secondary to grade 2B or 3 caustic injuries is reported to be more often than the general population in previous studies (4,5). Consequently, besides acute damages being critical, these patients require adequate periodic evaluation for the development of long-term complications.

Stricture particularly in the esophagus might develop in various

degrees depending on the miscellaneous caustic properties, amount, and type of the ingested corrosive substance. Stricture formation might result with a narrowed segment anywhere in the cervical, thoracic, or abdominal esophagus. In reports published in past two decades, it is suggested that the intraabdominal narrowed segment may lead gastroesophageal reflux disease (GERD) development, thereby shortening the distance (6,7).

In this study, we investigated whether there was any shortening in linear intraabdominal esophagus segment (IES) length of the children followed in a pediatric burn center. In addition, it was aimed to contribute to the literature with an emphasis on CSI in children, by investigating the predictor role of the change in IES length for the diagnosis of GERD which was explored with 24-hour pH monitoring.

MATERIAL and METHODS

Patient data collection

In this study, 16 children suffering from CSI were enrolled. The patients were managed in a pediatric burn center in Turkey between January 2012 and January 2013 by pediatric surgeons. The age, gender of the patients and the characteristic of the ingested substance were all recorded.

The Helsinki Declaration, in accordance local laws and regulations, were followed during the research. Written informed consent was obtained from the parents of the participating patients.

Diagnostic procedures

The esophageal mucosal injury was diagnosed and classified according to the findings in rigid esophagoscopy which was performed within the first 24 hours of ingestion and under general anesthesia. Cases in the study group had no other injury area except esophagus. The content of the corrosive substance had been omitted. Di Costanzo Grading system was utilized to grade burns (8, 9). (Table 1) The burn grades at the diagnosis were also recorded for each patient.

Table 1. Corrosive esophagitis grading chart (Di Costanzo Grading)

Grade	Findings
0	Normal
1	Mucosal edema Hyperemia
2a	Hemorrhagic mucosa Bullous mucosa Exudates Fibrinous membranes Superficial ulceration
2b	Circumferential ulceration (addition to the grade 2a)
3	Scattered small necrotic area, Hemorrhagic black or brown mucosa

IES length was measured longitudinally by abdominal ultrasonography (USG) in the first day and the third month of intake by the same radiologist. For IES, the distance from the diaphragm to stomach entrance was measured. The total esophageal length (TEL) of each patient was estimated with Strobel's formulae ($5 + 0.252 \times \text{Height}$) (10,11). The formulae give the data of the distance from the nares to the lower esophageal sphincter (10, 11)(Strobel, Byrne et al. 1979, Arcos-Machancoses, Tirado et al. 2019)(Strobel, Byrne et al. 1979, Arcos-Machancoses, Tirado et al. 2019)10, 11[10, 11]10, 11. The ratio of IES lengths to TEL was the fundamental measure to compare the findings on the first day and on the third month of CSI.

At the third week, the presence of stenosis was explored by esophagus-stomach-duodenum contrast radiography. Cases with esophageal stricture were included in the dilatation program with general anesthesia. Anterograde dilatation (mercury dilator) method was applied as the dilatation method (12). Dilatation was initiated with the smallest Fr dilator and dilated to a width appropriate for the age.

At the third month of the ingestion, 24-hour pH monitoring was performed with a Sandhill® (USA) brand pH meter device. Reflux index above 5% was accepted positive for GERD diagnosis according to DeMeester score (13-15).

Statistical analysis

SPSS software for Windows version 21 (IBM Corp., Armonk, NY) for was used for statistical analysis. Descriptive analyses are detailed as follows; number and percentage for categorical variables; mean $\pm$ standard deviation, minimum and maximum for numerical variables. The normality of distribution of continuous variables was tested by one-sample Kolmogorov-Smirnov test. In the comparison of the data Kruskal-Wallis and Mann Whitney-U test was used for the data that followed a non-normal distribution. Statistical significance level of alpha was accepted as $p < .05$.

RESULTS

Sixteen children suffering from CSI were prospectively evaluated. Nine (56%) of them were male and 7 (44%) of them were female. The mean age was 5.06 ± 4.95 years.

According to the findings of rigid esophagoscopy in the first 24 hours of ingestion, burn grades of the patients were as follows: 3 (19%) patients had grade 1 burn, 4 (25%) patients had grade 2a burn, and 9 (56%) patients had grade 2b burn. No patient was positive for grade 3 burn and stricture. No patients had any significant esophagitis. None of the patients had an anatomic malformation that would exacerbate GERD.

In the esophageal-stomach-duodenum contrast radiography that was performed three weeks later; esophageal stenosis was detected in 3 (18.75%) patients and all they had grade 2b burn. Esophageal dilatation was indicated in two of them because of dysphagia. In 3 cases with strictures, there was shortening in the IES length. One of them had GERD in the 24-hour pH monitoring performed on the third month.

When IES lengths were evaluated according to the IES/TEL ratio, 6 (37.5%) patients were found having shortened IES among the group. (Table 2) However, the shortening amount was not statistically significant according to the comparison of USG findings on the 1st day and the 3rd month. (Table 3) No statistically significant correlation was observed between the shortening of the IES length and the detection of GERD.

GERD was detected in 2 (12.5%) cases in the 24-hour pH monitoring performed at the third month of ingestion. One of them was 1-year-old infant with grade 1 burn and his esophagoscopy was normal. Second case was a 14-year-old patient with grade 2b burn and IES stenosis was present on esophagoscopy. (Table 2)

DISCUSSION

Unfortunately, still children continue to sustain caustic esophageal injuries in worldwide and the causative agent is either acid or alkali may lead severe gastrointestinal mucosal damage (16). Well-known complications of caustic burns are stenosis, esophagitis, or acute death due to perforation. Long-term following up of the patients is as important as the acute management and the therapy. Caustic esophageal stricture may be accompanied by GERD and the risk factors for development of GERD and the long-term effects remain unclear in patients with caustic mucosal damage (16,17).

In a study by Contini, it was reported that 71% of grade 2b and grade 3 esophageal burns developed stricture (16). In our study, grade 2b burns were detected in 9 (56%) patients and stricture

Table 2. Esophageal burn grade and esophageal length measurement of each patient

Patient	Esophageal burn grade in esophagoscopy	Esophageal burn grade in esophagoscopy	IESL (1st day) (mm)	IESL (3rd month) (mm)	TEL with Strobil (cm)	IESL/ TEL (1st day)
1	Grade 1	25	26	23.144	0.108	0.112
2	Grade 1	48	45	46.580	0.103	0.096*
3	Grade 1	23	23	25.916	0.088	0.088
4	Grade 2a	25.3	31.5	18.860	0.134	0.167
5	Grade 2a	21	18	27.680	0.075	0.065*
6	Grade 2a	32	28	23.900	0.133	0.117*
7	Grade 2a	14	17.6	26.672	0.052	0.065
8	Grade 2b	18	23	23.900	0.075	0.96
9	Grade 2b	13	22	28.940	0.044	0.076
10	Grade 2b	47	34	42.800	0.109	0.079*
11	Grade 2b	18.5	17.2	28.184	0.065	0.061*
12	Grade 2b	27	25.5	43.052	0.062	0.059*
13	Grade 2b	22	25.9	26.420	0.083	0.098
14	Grade 2b	19	19.2	25.160	0.075	0.076
15	Grade 2b	22	24	27.680	0.079	0.086
16	Grade 2b	29.4	30	34.736	0.084	0.086

*Patients with esophageal shortening
IESL, intraabdominal esophageal segment length; TEL, total esophageal length

Table 3. Mean IESL/ TEL at the 1st day and at the 3rd month according to burn grade

Burn grade	Mean IESL/ TEL (1st day)	Mean IESL/ TEL (3rd month)	p-value
1 (n=3, %)	0.099±0.1	0.098±0.12	0.630
2a (n=4, %)	0.980 ±0.41	0.103 ±0.04	0.790
2b (n=9, %)	0.075±0.17	0.170±0.29	0.790

IESL, intraabdominal esophageal segment length; TEL, total esophageal length

developed in 33% of grade 2b burns. Grade 1 and 2a burns did not complicated with stenosis.

The pathophysiology of GERD is quite complex, and several mechanisms are defined to highlight the etiopathogenesis (18, 19). There are limited previous studies that have discussed the relationship between GERD and stricture formation. The risk factors for GERD development in patients suffering from esophageal stenosis due to CSI remains the subject of publications in literature (17-19). İskit et al. investigated the relating factors affecting the prevalence of GERD in patients with esophageal stricture due to CSI. Thirty-three (63.5%) of 52 patients with esophageal stricture had GERD. Cases with esophageal strictures depending on the ingestion of alkali substances were 1.6-times more likely to have gastroesophageal reflux. Mean distance of

stricture was elongated in the direction of the length in patients with reflux (3.7±1.8 cm) than in patients without (2.2±1.0 cm) ($p<0.005$). Patients with long stricture distance were 1.9-times more likely to have reflux. They have shown that stricture is more common in Grade 2b and higher-grade burns (17). In our study we did not discussed the stricture length and its relationship with GERD.

IES length is one of the diagnostic indicators of GERD (19, 20). In a study by Khatami et al. the role of gastroesophageal USG in determining the pattern of GER in pediatric population was discussed. They suggested that except specific patients in whom mechanical etiologies are suspected to be responsible for GERD; barium swallow can be replaced by USG (20). We evaluated the children in the group by abdominal USG to monitor the

intraabdominal esophageal part and measure the length. While six of the 16 patients had shortened intraabdominal esophagus, other 10 cases had either unchanged or longer segment. Presumably, this was the result of patients' linear growth during the processes.

In the present study, stricture was detected in esophagoscopy of 3 (18.7%) patients, and these 3 patients had shortened IES length in abdominal USG at the third month. Among them, GERD was detected in 1 (33.3%) patient during 24-hour pH monitoring. The comparison of patients with and without stricture in terms of GERD, there was no significant difference.

The negative effects of chronic GERD on other defined causes of esophageal strictures are definitely known as increasing the risk of chronic esophagitis and Barrett's oesophagus (5, 19). In Grade 2b and higher corrosive burns, stricture and related shortening in the intra-abdominal esophagus should be expected, and GERD should be investigated to be able to avoid complications.

Limitations of the study were as follows: Firstly, small number of patients limits to making an effective comment and an impression on the relationship between the IESL measurement and GERD development in children with caustic mucosal damage. Secondly, with a control healthy group it would be possible to reach more expressive results in detail.

Caustic esophageal stricture is a potential risk for development of GERD in patients by shortening the IESL. In conclusion, IESL measurement by transabdominal USG should be assessed in this group of patients. Furthermore, 24-hour pH monitoring should be in mind of pediatric surgeons for the long-term following up of children with corrosive oesophageal injury and these patients should be followed-up routinely in terms of the long-term effects of reflux.

This study was produced from the pediatric surgery specialization thesis dated 2014.

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[OP-9]

LentiCRISPR v2 Plasmid System Mediated Knock-Out of NRAS Proto-oncogene Q61K Mutation in Malignant Melanoma Using CRISPR/Cas9 Method

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Aim: Malignant melanoma, continues to present an important public health problem as its incidence is increasing more rapidly than other cancers. The NRas proto-oncogene is one of the most common Ras genes in human malignant melanoma cancers, and mutations on NRas (codon 12, 13 and 61) are associated with tumor development. NRas^{Q61K}, a pathogenic important hotspot mutation, is driven by the Tyrosinase promoter in melanocytes or by a non-autonomous cell production of key ligands of the melanocyte lineage. Programming the CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) associated nuclease Cas9 to modify specific genomic loci is a new and popular method for interrogating gene function on a genome-wide scale. In this study, it was aimed to knock out the NRas^{Q61K} mutation that causes malignant melanoma cancer with the CRISPR/Cas9 technique using the lentiCRISPR v2 plasmid system.

Material and Methods: The lentiCRISPRv2 plasmid DNA supplied in stable form was transformed into calcium-compotent DH5alpha bacteria. Then, the designed gRNAs from the plasmid library into the lentiCRISPRv2 plasmid system were ligated. After the final transformation product obtained was isolated with a commercial plasmid DNA kit, it was transfected by electroporation into the SK-MEL-30 malignant melanoma cell line. Transfection success was measured by GFP irradiation in an inverted fluorescence microscope. Successful cells were diluted in 96-wells and generated from the master clone. Change in gene level was confirmed by real time PCR analyzes.

Results: Cells with GFP+ appeared as green glow under fluorescent microscope. As a result, knock-out changes were detected in the hotspot mutation region of gRNAs that were successfully designed with the lentiCRISPRv2 system.

Conclusion: Melanoma management and treatment is a complex issue that requires a multidisciplinary approach. Although surgical excision is the basis of treatment, genome editing/gene therapy treatment methods are being investigated. CRISPR/Cas9 is promising for the correction of many cancer-associated mutations.

Keywords: CRISPR/Cas9, NRas^{Q61K}, Malignant Melanoma, lentiCRISPRv2

INTRODUCTION

Skin cancers (the most common types are basal cell carcinoma, squamous cell carcinoma, malignant melanoma named according to the cell in which they arise and clinical behavior) are the most common malignancies, especially in the white population (1-3). Like other cancers in which environmental etiologies (such as UV exposure) play an important role, the incidence of malignant melanoma increases significantly with age and with carcinogenic mutagens (1). Malignant melanoma arises from melanocytes, the pigment-producing cells of the skin and eye, and is one of the deadliest human cancers with no effective treatment for metastatic disease. (4). Moreover, according to US statistical estimates, approximately 1 in 5 Americans are thought to be at risk of skin cancer, and there is a significant mortality rate (about 15,000 deaths) (3,5).

A molecular classification of melanoma has been made based on the most common oncogenic mutations (BRAF, NRAS, KIT) as a result of genetic analyzes of malignant melanoma. As a result of the resulting mutations, EGFR4 and NMDAR2 mutations, MITF and MET amplifications and loss of PTEN can be considered as initiating factors of metastasis. (4,6). Furthermore, loss of PTEN as well as BRAF and MITF amplifications are responsible for resistance to targeted therapies, whereas the NRAS mutation is the only constitutive genetic lesion showing any association with

susceptibility to immunotherapies (6).

Various changes in the MAPK pathway have been associated with various cancers (7). Activating mutations in NRAS and BRAF occur in 15-30% and 60-70% of melanomas, respectively (8) (Table 1). Although these changes appear to be insufficient for the development of melanoma, a number of benign nevi are also thought to carry mutations in the BRAF and NRAS genes. Additional genetic alterations, as well as activating mutations in BRAF and NRAS, required for melanoma progression are not well understood (9).

Due to the increasing incidence of cutaneous malignancies, multiple treatment options are needed in malignant melanoma. Although surgery is the basis of treatment options, new gene therapy options are currently being investigated due to developments in genetic/genome engineering. In this study, it was aimed to knock out the NRAS^{Q61K} mutation that causes malignant melanoma cancer with the CRISPR/Cas9 technique using the lentiCRISPR v2 plasmid system.

MATERIAL AND METHODS

Cell Culture

SK-MEL-30 Leibniz Institute DSMZ-German Collection of Microorganisms and Cell Cultures (DSMZ; It was obtained from

Table 1. Common mutations in the MAPK pathway found in melanomas (9).

CIN + (n:9)	Exon	DNA base changes	Amino acid exchange	Estimated frequency
Native thiol,	11	c.1727T>C	L576P	25
Median	11	c.1676T>C	V559A	20
(Min.-max.)	13	c.1924A>G	K642E	20
Total thiol,	2	c.182A>G	Q61R	35
Median	2	c.181C>A	Q61K	34
(Min.-max.)	15	c.1799T>A	V600E	80
Disulphide,	15	c.1798_1799delGTinsAA	V600K	5
Median	3	c.370C>T	P124S	-
(Min.-max.)	3	c.607G>A	E203K	-
MEK2	4	c.461C>T	S154F	-
	6	c.622G>A	E207L	-

Germany). Frozen cells were first thawed in a water bath at 37°C and then precipitated by centrifugation at 1500 rpm for 5 minutes. The cell pellet was then washed once with sterile 1X Phosphate-buffered saline (PBS; Sigma-Aldrich, USA) and precipitated again under the same centrifugation conditions. SK-MEL-30 cells Dulbecco's Modified Eagle's medium with 10% fetal bovine serum (FBS; Sigma-Aldrich, USA), 1% L-glutamine and 1% antibiotic solution mix (Penicillin/Streptomycin 1:1; Gibco Thermo Fisher Scientific, USA, DMEM; Sigma-Aldrich, USA) culture medium, incubated in T25 and T75 culture flasks in an oven with 5% CO₂ at 37°C and cultured under sterile conditions.

CRISPR Targeting Design

The NRAS^{Q61K} mutation was targeted in the SK-MEL-30 cell line using the CRISPR/Cas9 genome editing method. For this, firstly, the NRAS gene was extracted from the NCBI (National Center for Biotechnology Information) database (NM_002524), and the region of the gene where the exons were located and the localization of the Q61K mutation region were determined (Figure 1).

gRNA Design

In the analyzes made on the NCBI database, it was observed that

the Q61K mutation is located in exon 3 and is not adjacent to any intronic region. By looking at the GeCKO sgRNA library, gRNA design was made according to the NRAS exon3 sequence containing the relevant mutation. For knockout using the LentiCRISPR v2 system, the gRNA pairs in the Table 2 below with the least off-target activity were selected.

Table 2. The gRNA pairs designed for the LentiCRISPR v2 system.

NRAS_g1_Forward	CTTCGCCTGTCCTCATGTAT
NRAS_g1_Reverse	ATACATGAGGACAGGCGAAG
NRAS_g2_Forward	AACCTGTTTGTGGACATAC
NRAS_g2_Reverse	GTATGTCCAACAAACAGGTT
NRAS_g3_Forward	CAATACATGAGGACAGGCGA
NRAS_g3_Reverse	TCGCCTGTCCTCATGTATTG

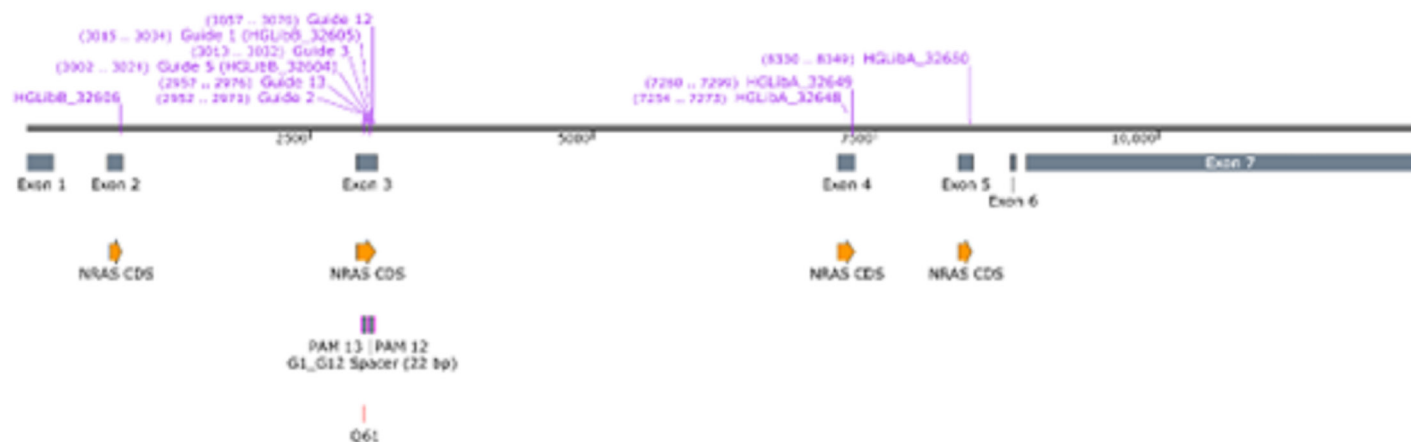


Figure 1. NRAS gene exon regions and Q61K mutation localization

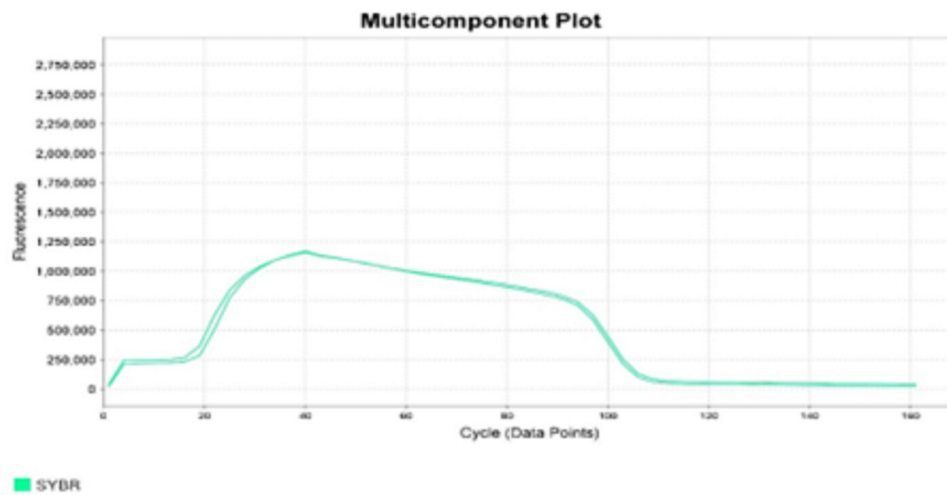


Figure 4. CRISPR and control PCR result multicomponent plot

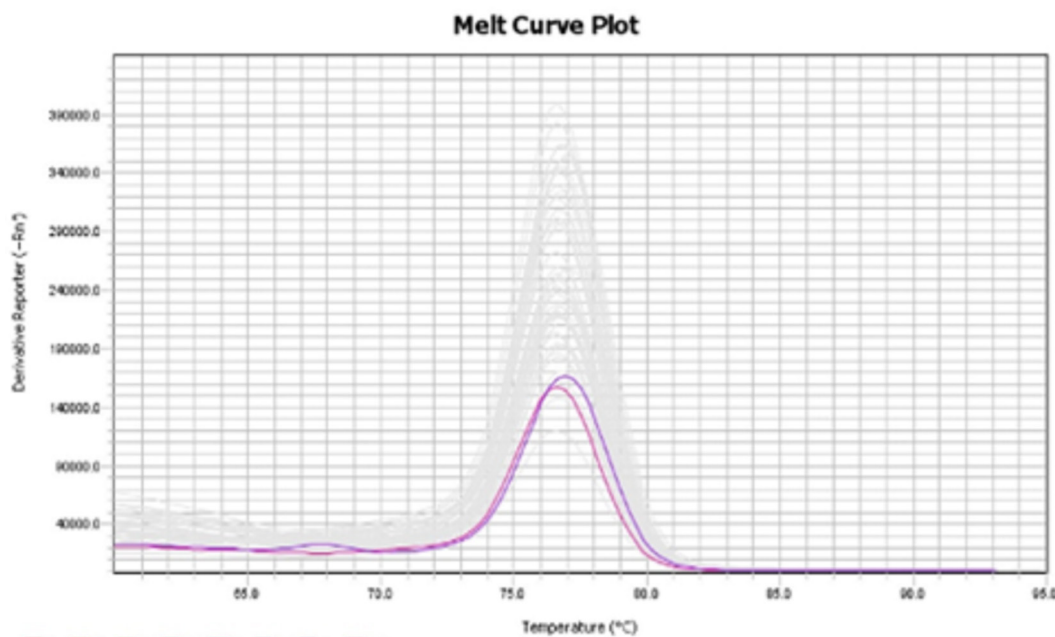


Figure 5. CRISPR and control PCR melt curve plot

Transfection

After cloning, mini and maxi cultures were established from a single colony, respectively. Bacteria proliferating after overnight culture were centrifuged at 1500 rpm for 15 min. Plasmid DNA was isolated from the bacterial pellet using the MN Nucleospin® plasmid mini prep kit. Then, plasmid DNA was transferred to SK-MEL-30 cells by electroporation at 250 V, 20 ms, 1 pulse. Cells were recultured under appropriate conditions.

Real-time PCR

After DNA isolation from cells, qPCR analysis was performed. Plasmid DNA, SYBR green master mix (Promega, USA), nuclease free water and the designed primers were mixed in appropriate proportions. CRISPR DNA and control DNA melting curve results were compared.

RESULTS

According to the real time PCR results, there was a 1-2 Ct shift in the CRISPR-applied binary groups. The reaction peak curves have reached the desired plateau phase (Figure 3). Multicomponent curves were stable and parallel according to SYBR green (Figure 4). In the melting curve analysis, we detected parallel but relatively different rising curves (Figure 5).

DISCUSSION

CRISPR/Cas9 technology enables specific genome-wide editing (10). However, knock-out success depends on the transferred CRISPR plasmid and the off-target ratio of gRNA (11). The presence and localization of the PAM sequence in the target region and the base change in the target region are very important (12). In this study, it was planned to knock- out the Q61K mutation

of the NRAS proto-oncogene, which is a pathogenic mutation surrounded by PAM sequences. In particular, considering the amino acid change that occurs as a result of the base change in this region, the combination of knock-out and knock-in was also targeted in further studies. In the future, if the efficacy on cancer stem cells is targeted by human induced pluripotent stem cell (iPSC) studies, an effective cancer immunotherapy/gene therapy can be performed.

According to the preliminary results we presented in this study, among the designed gRNAs, gRNA1 and gRNA2 successfully caused changes in the targeted region. However, research findings should be supported by sequencing in order to understand a definite and clear base change. Although the lentiCRISPR v2 used in our study is a particularly suitable plasmid for lentiviral transduction, it contains the Cas9 gene for a successful knock-out. Thanks to the gRNAs transferred to the appropriate region, the CRISPR/Cas9 system is operated. According to real time PCR results, small peak difference and Ct shifts seen in melting curve analysis drew attention to region-specific arrangements.

CONCLUSION

In this study, it was aimed to destroy the NRAS^{Q61K} mutation that causes malignant melanoma cancer with the CRISPR/Cas9 technique using the lentiCRISPR v2 plasmid system. The use of gRNAs designed with off-target efficiency in mind is very important for a successful knock-out. In order to increase knock-out efficiency, new knock-out systems mediated by FokI endonuclease and dCas9 can also be tested for cancer gene therapy studies. Undoubtedly, the combination of genome editing and immunotherapy will become more important in the future for cancer treatment.

ACKNOWLEDGMENT

The study was generated from part of the first author's M.Sc. thesis entitled "Application Of CRISPR/Cas9 Technique To NRas Gene Q61K Mutation in SK-MEL-30 Cell Line".

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[OP-10]

Nursing Care in Patients Undergoing Coronary Artery Bypass Graft Surgery (CABG)

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Coronary heart disease (CHD) is reported as the biggest and only cause of death among men and women, with approximately 2500 deaths per day. However, despite this high number, technological advances in diagnosis and treatment methods, use of thrombolytic drugs in Acute Myocardial Infarction (MI), advances in interventional treatment and surgical techniques, and changing risk factors in the population at risk have been effective in the decrease in the death rate from CHD in recent years.

Although there are various mechanisms and many risk factors for CHD, it is reported that the primary cause is inflammation and fat accumulation in the arterial wall. Coronary arteries are particularly susceptible to the mechanism of atherosclerosis due to their anatomical structure. Although heart disease is usually caused by atherosclerosis of the coronary arteries, coronary artery vasospasm, myocardial trauma caused by internal or external factors, structural diseases of the heart, congenital anomalies, increased oxygen requirement (eg, rapid heartbeat, substance abuse, etc.) or It may also occur due to a decrease in blood pressure (eg, acute blood loss, anemia, drop in blood pressure).

Heart disease can be treated medically and surgically. Coronary bypass graft surgery provides re-flow of blood beyond the coronary arteries that are blocked in the heart, reducing symptoms and cardiac problems, prolonging life expectancy and increasing its quality. Individuals who need cardiac surgery experience shock, sadness, helplessness and fear of death, as the situation is usually urgent. For this reason, the pre-operative psychological preparation of the patient who will have heart surgery is very important. Early postoperative care focuses on ensuring and maintaining the patient's hemodynamic stability and recovery from general anesthesia. The immediate post-operative care of the patient undergoing cardiac surgery includes monitoring of cardiopulmonary status, pain management, wound care, progressive activity, and regulation of nutrition. In the light of this information, nursing care practices of patients undergoing coronary bypass graft surgery are presented in this review.

Keywords: Coronary Artery Bypass Graft, Coronary Heart Disease, Nursing, Care

INTRODUCTION

Coronary artery disease is one of the diseases with the highest mortality rate in the world, characterized by myocardial ischemia, hypoxia and myocardial necrosis caused by stenosis or coronary artery occlusion (Zhou et al. 2020). Coronary artery disease results in approximately 805 thousand Myocardial Infarctions (MIs) every year (Benjamin et al. 2019). Treatment options in coronary artery disease consist of lifestyle changes, medications, percutaneous coronary applications and coronary artery bypass graft (CABG) surgery (Esmaili et al. 2022). Coronary artery bypass graft ranks highest (13.5%) for preventable readmissions (Shaughnessy et al. 2021).

CABG surgery involves bypassing the occlusion of one or more coronary arteries, using the saphenous veins, mammarian arteries, or radial arteries as conduit or replacement vessels; thus, blood supply of the myocardium is ensured, symptoms and cardiac problems are reduced, life expectancy is prolonged and its quality is increased (Bucher and Johnson 2014). Decreased self-management ability and treatment compliance of the patient causes re-stenosis in the coronary arteries and creates a burden on the family and society. For this reason, it is important nursing interventions to understand the adaptation behaviors of the patients, the effect of the treatment and their psychological state, and also to provide medical and psychological support to the

patients (Zhou et al. 2020).

CABG surgery is performed with two methods, traditional and alternative.

CABG with Traditional/Extracorporeal Circulation

During traditional CABG surgery, a median sternotomy incision is made to reach the heart and aorta. The individual is connected to a cardiopulmonary bypass (CPB) machine and the heart is stopped using an iced saline solution (cardioplegic solution) containing potassium. After the bypass operation, the individual's connection with the machine is cut off and the heart is reworked (Jarvis 2000; Keresztes and Weisel 2009).

Alternative CABG Surgery

CABG in the Working Heart (Off Pump): In working heart CABG surgery, which has been used since 1990, a standard median sternotomy incision is made, but the surgical procedure is performed without using the cardiopulmonary bypass technique. Beta adrenergic blockers can be used to slow the heart rate. The myocardial stabilization tool is used to hold the coronary artery bypass graft anastomosis in place while the heart is working. This technique has potential benefits in reducing the incidence of heartbeat and neurological complications, as well as kidney failure and other post-operative complications. Compared to the

traditional technique, it was concluded that alternative CABG is more advantageous in some patient groups, especially in terms of stroke, MI, the need for revascularization, and overall mortality (Jarvis 2000; Keresztes and Wcisel 2009).

CABG Surgery Complications

Cardiovascular Complications: During surgery, the metabolic requirements of the heart decrease, while the nutrient, blood and oxygen requirement of the myocardium continues. Therefore, the most important cardiovascular changes observed after surgery are ischemia and contraction of the heart muscle. Depending on this, patients may experience arrhythmias due to electrolyte imbalances and ischemia, and decrease in cardiac output due to hypovolemia. When this occurs, inotropic drugs to maintain cardiac output; Antiarrhythmic drugs are used to control rhythm disorders (Anthony and Sendelbach 2007; Keresztes and Wcisel 2009; LeMone et al. 2015).

Hematological Complications: Persistent bleeding can be seen due to the disruption of the function of platelets by the bypass device, administration of anticoagulant treatment during the surgery, hypothermia changing the coagulation mechanism, and the trauma of the surgery to the tissues and vessels. In addition, the increase in capillary permeability due to the stimulation of the inflammatory response leads to edema. (Anthony and Sendelbach 2007; Keresztes and Wcisel 2009; LeMone et al. 2015).

Renal Complications: When cardiac output is low, complications such as acute renal failure, acute renal tubular necrosis and electrolyte imbalance may develop. Acute renal failure; It usually resolves within three months, but may become chronic and require continuous dialysis. Acute tubular necrosis; It occurs as a result of the kidneys not being adequately perfused or the drugs damaging the renal tubules. Electrolyte imbalance; It may develop postoperatively due to potassium, magnesium, sodium, calcium and glucose imbalances, surgical losses, metabolic changes, administration of drugs and IV fluids (Anthony and Sendelbach 2007; Keresztes and Wcisel 2009; LeMone et al. 2015; Kanan 2018).

Pulmonary complications: During bypass surgery, due to the inability of the lungs to be ventilated, alveoli may collapse and surfactant may not be produced at a normal level. Respiratory distress may occur as the lungs collapse. In addition, gas exchange may be impaired as a result of anesthetic agents increasing mucus production and ineffective ventilation due to incision pain in the chest. Early extubation and ambulation of patients may reduce pulmonary complications (Anthony and Sendelbach 2007; Keresztes and Wcisel 2009; LeMone et al. 2015).

Neurological Complications: Neurological complications such as stroke and encephalopathy may occur after surgery. Embolic stroke as a result of the damage to the plaques formed by the accumulation of cholesterol on the vessel wall and the rupture of a small piece or the mixing of the air in the by-pass machine into the circulation; thrombotic stroke as a result of occlusion of cerebral vessels by fragments of clots formed in the wall of the atria or in the carotid arteries; encephalopathy may develop as a result of mild paralysis, cerebral edema or cerebral ischemia (Anthony and Sendelbach 2007; Keresztes and Wcisel 2009; LeMone et al. 2015).

Infection: Surgical intervention and anesthesia adversely affect the immune system of the patient. Invasive equipment used to support healing and monitor the patient can be a source of infection. Wound infection and separation of the sternum are possible postoperative complications (Anthony and Sendelbach 2007; Keresztes and Wcisel 2009; LeMone et al. 2015).

NURSING CARE

Preoperative Care

Preoperative preparation of patients who will undergo CABG surgery ensures that post-operative recovery is accelerated and complications are reduced. Pre-operative preparation; It includes physiological, psychological preparation and patient/family education. The physiological preparation of the patient for whom CABG is planned includes detailed evaluation of all systems, especially the cardiovascular and respiratory systems (Aslan and Karadakovan 2013; Kocabeyoğlu et al. 2014).

The appearance of clinical signs associated with cardiopulmonary diseases may differ from individual to individual. In acute situations, the individual may experience different reactions of psychological trauma more intensely, such as shock, sadness, anxiety, helplessness, disability or fear of death. Therefore, the psychological preparation of the patient who will undergo heart surgery is also very important (Kocabeyoğlu et al. 2014; Kanan 2018).

Preoperative physical and psychosocial diagnoses form the basis of postoperative care. The patient's understanding and compliance with surgical intervention, informed consent, and treatment protocols should be evaluated. It is the nurse's responsibility to inform and manage the procedure.

The nurse should evaluate the patient in terms of diseases such as diabetes and hypertension that may be effective in the postoperative period, and the drugs he uses (Keresztes and Wcisel 2009; Enç and Uysal 2015).

It is performed by creating a care plan that includes emotional support and education for the patient and family in the preoperative period. Positive communication is established with the patient and his questions are answered; her fears and relationships are listened to, misunderstandings are corrected, and she is informed about what awaits her during the surgical intervention. These nursing approaches are important care initiatives in terms of emotional preparation of the patients and their family (Aslan and Karadakovan 2013; Kanan 2018).

The patient is informed about deep breathing and coughing exercises, the use of spirometry and foot exercises, and they are applied to the patient before the operation. The family will usually have questions about the duration of the surgery, when and from whom they can get information about the results of the surgery after the surgery, where to wait after the surgery, the visit conditions of the intensive care unit and how they will support the patient before the surgery. The questions of the patient's family should be answered (Kocabeyoğlu et al. 2014; Kanan 2018).

Postoperative Care

Early post-operative care focuses on ensuring and maintaining the patient's hemodynamic stability and recovering from general

anesthesia. After the cardiac and respiratory conditions are stable in the Post-Anesthesia Care Unit (PACU), the patient is transferred to the surgical intensive care unit. Important information about surgical intervention and post-operative care is reported to the intensive care nurse, who is responsible for the care of the patient, by the surgical team and anesthesia staff. Care includes monitoring of cardiopulmonary status, pain management, wound care, progressive activity and regulation of nutrition (Leeper 2007; Aslan and Karadakovan 2013; LeMone and Burke 2015).

During the postoperative period, indicators of the patient's psychological and emotional state are evaluated to regain consciousness and diagnose their progress (Leeper 2007). The patient may experience behaviors reflecting depression and rejection, or delirium after cardiectomy. Temporary perceptual illusions, visual and auditory hallucinations, hallucinations, and disorientation can be seen as characteristic symptoms of delirium (Smeltzer et al. 2008; LeMone and Burke 2015).

In the postoperative period, the needs of the family should also be identified. The nurse should question the coping mechanisms used by the family and their psychological, emotional and spiritual needs; should learn whether they have sufficient information about the patient's condition (15,13 LeMone and Burke 2015).

Discharge Education/ Home Care

Patients undergoing CABG surgery are discharged within an average of one week if they have normal health parameters and it takes approximately two months to return to their daily lives. Starting from the preoperative period, an education program that meets the individual needs of the patient and includes the family should be developed and implemented (2). The training program should include information on incision care, signs and symptoms of infection, nutrition, increasing activity and exercise program, deep breathing (use of spirometry) and coughing exercises, non-smoking, weight control, medication, pain control and follow-up appointments (2,12). In addition to providing written and oral patient education, the use of educational booklets and brochures will increase the effectiveness of education (2,16).

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ORAL PRESENTATION ABSTRACTS

[OP-11]**Moringa oleifera Ameliorates Metabolic Syndrome in HFD induced rats**

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AimMetabolic syndrome (Met-S) is characterized by co-existing metabolic abnormalities including obesity, diabetes mellitus and cardiovascular problems.

Objectives: The present research aimed to explore the efficacy of Moringa Olifera (Me.MO) for the management of metabolic syndrome based on its anti-inflammatory and antioxidant potential.

Material and methods: A series of in-vitro and in-vivo studies were employed. Data were analyzed through GraphPad Prism software (2.2 Shicago, USA) and values less than 0.05 were assumed to be significant.

Results: Data of HPLC analysis confirmed the presence of flavonoids and phenolic acids. Findings showed that rats received 500 mg/kg Me.MO showed a significant ($p > 0.01$) decrease in plasma glucose level and body weight as that of the 250 mg/kg treatment group. Moreover, results were comparable with metformin-treated rats. Laboratory data exhibited a significant ($p < 0.05$) inhibitory effect of Me.MO on pro-inflammatory mediators and caused a sharp increase in anti-inflammatory cytokines levels in all treatment groups. Histopathological analysis exhibited no structural and functional alteration in the liver and adipose tissues.

Conclusion: Altogether, methanolic extract of Moringa olifera ameliorates experimentally induced Met-S by improving dyslipidemia and insulin resistance. However, further investigations are still needed to confirm the safety and efficacy of Moringa olifera for clinical application.

Keywords: Metabolic diorders, Diabetes mellitus, Moringa olifera extract, Insulin resistance, Obesity

[OP-12]

Evaluation of Patients Over 80 Years Old Hospitalized in the Internal Diseases Service and Intensive Care Units of our University

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Aim The aim of this study is to evaluate the patients over the age of 80 who were admitted to the internal medicine service and intensive care unit after emergency and polyclinic applications of Çanakkale Onsekiz Mart University Faculty of Medicine.

Material and methods: In this study, patients over the age of 80 who applied to the emergency department and internal medicine outpatient clinic of our university between January 2022 and June 2022 and were admitted to the service and intensive care unit were included and analyzed retrospectively. Patients admitted to the Covid-19 service and intensive care unit are not included. Data on age, gender, place of admission, chronic disease history, hospitalization sites, hemogram parameters, urea, creatinine, eGFR, sodium, potassium, and calcium were analyzed from the records. The data were evaluated with the SPSS 26.0 package program.

Results: During the research period, the number of patients hospitalized from emergency to internal medicine clinics was 60, and 25 (41.7%) of these patients were admitted to the internal medicine service and 35 (58.3%) were admitted to the intensive care unit. The number of applications from the internal medicine outpatient clinic was 40, and 37 (92.5) of these patients were hospitalized in the internal medicine service and 3 (7.5%) in the intensive care unit. Age ($P=0.04$), Wbc ($p<0.001$), neutrophil ($p<0.001$), neutrophil-lymphocyte ratio (NLR) ($p<0.001$), monocyte-lymphocyte ratio (MLR) ($p=0.048$) of patients hospitalized from emergency to internal medicine clinics were statistically significant.

Conclusions: NLR, MLR, wbc, neutrophil and lymphocyte counts of the patients hospitalized in the emergency department were found to be statistically significantly higher than the patients hospitalized in the outpatient clinic. Prospective studies are needed.

Keywords: Geriatrics, Neutrophil to lymphocyte ratio, Monocyte lymphocyte ratio

[OP-13]

Investigation of the Effects of Drugs Used in the Treatment of COVID-19 on Hemodynamic Parameters in Rats

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Aim: Hydroxychloroquine (HCLQ), favipiravir (FAVI), molnupiravir (MOL) and dexamethasone (DEX) are drugs that have been used recently and today in the treatment of Coronavirus Disease (COVID-19). It was aimed to investigate the effects of MOL, which is currently used according to the living treatment guideline, HCLQ and FAVI, which are discontinued, and the combination of these drugs with DEX on blood pressure (BP), heart rate (HR), electrocardiogram (ECG) intervals and arrhythmia types in rats.

Material ve Methods: Wistar albino male rats were randomly divided into seven groups. 1. Control, 2. HCLQ, 3. FAVI, 4. MOL, 5. HCLQ+FAVI, 6. MOL+DEX, 7. HCLQ+FAVI+DEX. The doses of the drugs to be administered to the experimental groups were adapted to the rats from the clinical treatment protocol. HCLQ: 20.7 mg/kg twice a day orally for 5 days, FAVI: 165.3 mg/kg loading dose on the first day, then 62 mg/kg maintenance dose twice a day orally for 5 days, MOL 82.7 mg/kg twice a day orally for 5 days and DEX: 0.62 mg/kg intramuscularly for 10 days were administered. On the 14th day of the experiment, the systolic, diastolic and mean BP and HR values of the rats were measured invasively by carotid artery cannulation under urethane anesthesia. PR, QRS and QT intervals were measured according to the Lambeth Convention Guidelines using 3-lead ECG electrodes. The numbers of arrhythmia, ST depression, ST elevation, T negativity and blocks were determined within the group.

Results: When the systolic, diastolic and mean BP values, HR, PR, QRS and QT interval times of the rats were compared, a statistically significant difference was found between the groups only in the PR interval ($p < 0.001$). Arrhythmia was found mostly in FAVI (1) and HCLQ+FAVI (1) groups. ST depression was mostly found in the MOL (3) group. ST elevation was not found in any of the groups. T negativity was found mostly in the MOL (4) group. Block was found mostly in FAVI (7) and HCLQ+FAVI (7) groups.

Conclusion: When hemodynamic findings, ECG changes and arrhythmia variations are evaluated together, further studies are needed to investigate the cardiovascular effects of drugs histopathologically and biochemically.

Keywords: COVID-19, hydroxychloroquine, favipiravir, molnupiravir, dexamethasone, hemodynamic

This work was supported by İnönü University Scientific Research Project Unit (Project ID: TOA-2020-2347).

[OP-14]

Investigation of Turkish Journals in the Scope of Web of Science in the Field of Health Sciences

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Aim: Publications listed in international indexes provide support in scientific, technological and economic progress. In this study, some features of the journals published in Turkey in the field of health sciences and indexed in the Web of Science database were examined.

Material and methods: According to the results of the search on the Web of Science database, those in the field of health sciences were determined from 298 journals published in Turkey. The impact factors, quartile (Q), h index values, annual numbers and publication languages of the journals were examined.

Results: As a result of the examination, 109 journals available in the Web of Science database in the field of health sciences were identified. It was seen that 26 of these journals were indexed in SCIE, one in SCIE-SSCI, two in SSCI and 80 in ESCI indexes. Twenty-eight (25.7%) of the journals had an impact factor, and 69 (63.3%) had an h index value. In 2020, one journal, four journals, 25 journals, and 35 journals appeared in Q1, Q2, Q3, and Q4, respectively. In 2021, two journals, three journals, 33 journals, and 31 journals were in Q1, Q2, Q3, Q4, respectively. The annual publication numbers of the journals range from 1 to 12. The languages of publication are predominantly English (76.1%), but also Turkish (2.8%) or Turkish / English (21.1%).

Conclusions: With this study, it was aimed to draw attention to the Turkish journals available in the Web of Science database in the field of health sciences. Further studies should examine the quality and development levels of national journals. In this context, the quality of articles in Turkish journals and what needs to be done to improve the quality of journals in international indexes should be determined.

Keywords: Journal, health sciences, Turkish, web of science

[OP-15]

Metric and Qualitative Review of Journals in Pediatrics: A View at Journals in Turkey

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Aim: Factors such as the database in which a scientific journal is indexed (SCIE, ESCI, TR-INDEX etc.), quartile, impact factor, H index are the parameters that enable us to understand the quality of the journal. The aim of this study was to examine the metric and qualitative characteristics of pediatric journals originating from Turkey.

Material and methods: According to the results of a search conducted on the Web of Science and TR-DİZİN database to meet the category of pediatrics, the H index, impact factor and quarter of the Web of Science indexed journals were analyzed. In addition, the distribution of the publications of the journals in 2020 and 2021 according to the types were examined.

Results: As a result of the analysis, a total of 15 journals originating from Turkey were reached. Two of these journals were scanned in SCIE, five in ESCI, and eight in TR-INDEX. One of the journals was in the Q2, two in the Q3, and two in the Q4. When the types of articles published by the journals were examined, the highest numbers were original articles (1049), case reports (332) and reviews (159). One of the journals in the field of pediatrics was in the field of endocrinology, one in infectious diseases, one in emergency and intensive care, one in mental health, one in surgery, while the remaining 10 were in the field of general pediatrics. The publication language of 7 of the journals was only English, 7 of them were Turkish and English, and 1 of them was only Turkish.

Results: The number of scientific journals owned by a country and the quality of these journals are among the criteria of its development in science. In our study, characteristics of pediatric journals and scientific publications in these journals are presented.

Keywords: Journal, Pediatrics, Turkish

[OP-16]**Multiple Pregnancy and Management****İD Gökhan Kablan**

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Multiple pregnancy rates have increased dramatically in recent years. The twin pregnancy rate increased by 76% between 1980 and 2009, from 18.9 to 33.3 per 1,000 births. Triplets and higher number of multiple pregnancies increased by 400% in the 1980s and 1990s. There are two main reasons for this increase in the incidence of multiple pregnancy:

- 1) The shift of the gestational age to advanced ages, where multiple pregnancy is more common,
- 2) The development of assisted reproductive techniques is their more widespread use.

The main problem encountered in multiple pregnancies is spontaneous preterm birth and neonatal morbidity and mortality associated with it. Although there are various methods to prolong the duration of these pregnancies and improve outcomes, these methods are limited. It is very important to determine zygosity and chorionicity in the management of multiple pregnancies. Especially with the ultrasonographic findings of the patients at the 1st Trimester application, we can determine the chorionicity close to one hundred percent. In ultrasonography, lambda sign finding indicates dichorionic diamniotic pregnancy, while T sign indicates monochorionic diamniotic twin pregnancy. Thirty percent of twin pregnancies are divided into monozygotic and 70 percent dizygotic. Dizygotic twins form diamniotic dichorionic pregnancies, while monozygotic twins are formed according to the days of division after fertilization of the ovum. Dichorionic diamniotic if split between 1st and 3rd days, monochorionic diamniotic between 4th and 8th days, monochorionic monoamniotic if between 8th and 13th days. Conjoined twins if division occurs after 13 days. Diamniotic dichorionic pregnancies are similar to singleton pregnancies. Monochorionic pregnancies are twin pregnancies with the highest maternal and fetal complications. Twin to twin transfusion syndrome, twin anemia polycythemia sequence, twin reverse arterial perfusion sequence, selective growth restriction, single fetal death and congenital anomalies can be seen frequently. Although the treatment and management of complicated twin pregnancies is controversial, it should be made by taking joint decisions in line with the family's request, although it varies according to the week of pregnancy and the family's wishes. Birth timing of twin pregnancies according to ACOG;

- 1) Non-complicated Diamniotic dichorionic pregnancies 38 weeks
- 2) Non-complicated monochorionic diamniotic 34-37 weeks
- 3) Non-complicated monoamniotic monochorionic 32-34 weeks

Births are suggested.

- 1) Multifetal Gestations: Twin, Triplet, and High-Order Multifetal Pregnancies. ACOG Practice bulletin No 144. Obstet Gynecol 2014;123:1118-28.
- 2) Jon F.R. Barrett, N Engl J Med 2013
- 3) Amy Elizabeth Sullivan, Am J Obstet Gynecol 2012

[OP-17]

Use of Corticosteroids in the Treatment of Riedel Thyroiditis

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Riedel's thyroiditis (RT) is a rare condition that affects the thyroid parenchyma and surrounding structures as a result of an autoimmune fibrotic process. Surgical intervention is often difficult and the risk of complications is high. Glucocorticoids are the mainstay of therapy. Alternative agents such as tamoxifen, mycophenolate and rituximab can be used in unresponsive cases. Here, a case of RT with clinical and radiological improvement with glucocorticoid therapy is presented. A 44-year-old female patient had progressive neck pain and shortness of breath in the last few months. Considering subacute thyroiditis, she was followed up with non-steroidal anti-inflammatory drugs. The patient was admitted to our clinic due to the absence of regression in his complaints and the development of progressively increasing dyspnea. Physical examination at the time of admission revealed a stage 3 goiter, hard and fixed to the surrounding tissues. Pemberton's sign was positive. Laboratory analysis revealed TSH 0.78 uIU/mL, fT4 1.2 ng/dL, fT3 3.83 pg/mL, anti-Tg 7558 IU/mL, anti-TPO 512 IU/mL, sedimentation 71 mm/h, CRP 51 mg/L. On ultrasonography, the thyroid lobe dimensions increased and the parenchyma was heterogeneous. In magnetic resonance, heretogenic hypointense and mild diffusion restriction was observed in T2 sequences (Figure 1). In the differential diagnosis, RT, lymphoma, sarcoma, anaplastic thyroid carcinoma, and IgG4-related disease were considered. Serum IgG4 was 0.72 mg/L (0.03-2.01). Thorax and abdomen imaging were normal. As a result of thyroid tru-cut biopsy, mildly inflamed diffuse collagenous connective tissue in almost the entire thyroid gland and a dense inflammatory infiltration focus in a limited area were detected (Figure 2). In immunohistochemical examination, actin pale cytoplasmic staining, desmin (-), S100 (-), CD3 (+), IgG4 (-), LCA (+), TTF-1 (+), CD20 sparsely (+), and Ki 67 1% detected. As the diagnosis was found to be compatible with RT, 64 mg/day methylprednisolone was started. In the first month follow-up, the patient's dyspnea and other symptoms had significantly regressed. In the follow-ups, clinical and laboratory well-being continued despite steroid dose reduction (Table 1). After 6 months of treatment, methylprednisolone was discontinued. In the 1st year of follow-up without treatment, the state of well-being continues. RT is a very rare form of fibrous destruction of the thyroid parenchyma leading to thyroid dysfunction and progressive airway obstruction. It is important to distinguish this condition, especially from malignant lesions. Because some of the patients respond well to steroid treatment.

Keywords: Riedel's thyroiditis, thyroid, treatment, glucocorticoids

[OP-18]

Pharmacological Studies of Sumac Plant on COVID 19

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Since 2019, the COVID-19 virus has caused severe lung damage and acute respiratory syndrome, leading to global epidemics with high morbidity and mortality, and the world health organization has declared it as a cause of pandemic. At the beginning of 2020, many national and international organizations urgently took action to develop vaccines, and dozens of approved vaccines have been developed so far. Despite the significant effectiveness of vaccines, the continuation of deaths because of COVID-19 has increased people's interest in traditional medicine.

The uncertainty in the diagnosis, prevention and treatment of many diseases, especially chronic diseases, has increased the interest in treatment methods other than modern medicine all over the world. It is stated that over 85% of the population in Africa, Asia and the Middle East use herbal medicines as the first treatment option. Some compounds got from plants, especially flavonoids; antiviral activity of quercetin, silymarin, polyphenolic compound glycyrrhizin and curcumin has been showed.

Sumac is the common name for a genus (*Rhus*) in the Anacardiaceae family that includes over 250 species of flowering plants. Many compounds such as fatty acids, phenolics, organic acids, essential oils, proteins, fibers, vitamins and minerals have been isolated from different parts of the sumac plant (4). It is considered a reasonable treatment in traditional medicine because of its analgesic, anorexic, antidiarrheal, antiseptic and antihyperglycemic properties. Djakpo and Yao reported that sumac contains potent antiviral properties. The bioactive compound of sumac with antiviral activity is polyphenol tetra-O-galloyl- β -d-glucose (TGG), a tannin. Ling et al. found that TGG exhibited significant inhibition against severe acute respiratory syndrome coronavirus (SARSCoV). It has been stated that SARS-CoV-2 (COVID-19) belongs to the same beta coronavirus class as the previously known SARS-CoV and MERS-CoV, and they are similar in terms of genome sequence, life cycle, mode of entry into a host, mode of transmission and clinical symptoms. Therefore, it has been stated that many herbs used in the treatment of SARSCoV will also be effective on COVID 19. Sherif et al. identified six polyphenolic compounds of *Rhus* spp as potential inhibitors to the SARS-CoV-2 major protease enzyme (Mpro; 6LU7).

Keywords: Sumac, COVID 19, Traditional Medicine

[OP-19]**Clinical Practices and Experience of Thoracic Surgery During the Covid-19 Pandemic**** Suleyman Anil AKBOGA**

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During the pandemic, conditions requiring emergency intervention by thoracic surgery such as subcutaneous emphysema, pneumomediastinum, pneumothorax, hydropneumothorax, pleural effusion were frequently seen in patients infected with covid-19 virus, especially in intensive care units. Early intervention is crucial for early treatment of diseases and symptoms such as lung cancer, mediastinum malignant diseases, chest wall and esophagus cancer, detachment and stridor resulting from benign tracheal stenosis. Early treatment of lung cancer is around 92% of the 5-year survival. For this reason, the monitoring and treatment processes of patients applying for lung cancer in pandemic have continued. Elective surgeries such as thorax wall deformities, extratorachal sympathectomy have been delayed. However, in patients with surgery, they were treated with certain precautionary measures before and after surgery. The first thing to do when we review these precautions is to test the RT-PCR for determining the SARS-COV-2 RNA in the preoperative period of all patients to be opted for. During the preoperative period, patients must have CRP, ferritin, leukocyte count, D-dimer, procalcitonin, 1 days prior to surgery. As a result, a potential infection should be predicted and delayed operation in the presence of doubt, and the surgical team should be protected from infection, complications in the patient. In addition, postoperative CRP, ferritin, leukocyte count, D-dimer, procalcitonin should be followed. Due to the trauma caused by surgery, there may be an increase in the number of D-dimer, CRP and leukocytes, but the number of lymphocytes is not expected to drop, increase in procalcitonin, and increase in fruits. As a result, surgery for malignant patients should be carried out without delay, although precautions to be taken in preoperative, intraoperative and postoperative procedures may vary in the operation of breast surgery during the covid-19 pandemic process. The surgery, which is to be implemented with appropriate precautions, especially in malignant patients, is very important to protect the health of the patient and to protect the surgical team from the infective process. Health personnel protected from the infectious process of the Covid-19 pandemic are very important for the continuity of health services in a pandemic.

Keywords: Thoracic Surgery, Pandemic, Lung Cancer, Covid-19

[OP-20]**The role of video-assisted thoracic surgery (VATS) in the detection and treatment of potential diaphragmatic injuries in patients with penetrating chest trauma****İD Güntuğ Batıhan**¹Kars Harakani State Hospital, Department of Thoracic Surgery, Kars, Turkey

Aim: Penetrating chest traumas constitute approximately 10% of thoracic traumas (1). In 15-30% of cases, tube thoracostomy is sufficient and no further surgical intervention is required. However, it is difficult to detect especially small-sized diaphragmatic injuries with imaging methods in the acute phase of trauma. The aim of this study is to investigate the role of video-assisted thoracic surgery (VATS) in the detection and treatment of possible diaphragmatic injuries in patients with penetrating chest trauma.

Material and Methods: The data of patients who applied to our clinic due to penetrating chest trauma between February 2022 and July 2022 were reviewed. Among this patient group, those who underwent video-assisted thoracic surgery (VATS) for exploration were included in the study. Preoperative, operative and postoperative data of the patients were recorded.

Results: A total of 12 patients who met the inclusion criteria were included in the study. Three of the patients were female and 9 were male. The mean age was 31.8 ± 9.9 years. The injury was on the right side in 6 patients, on the left in 4 patients, and bilateral in 2 patients. None of the patients had radiological suspicion of diaphragm laceration. Diaphragm laceration was detected in 3 (25.0 %) patients in VATS performed for exploration purposes. Diaphragmatic lacerations were repaired with interrupted horizontal mattress sutures (0 Silk). No intraoperative and postoperative complications were observed. The mean length of postoperative hospital stay was 4.2 ± 0.7 days.

Conclusion: Although there is no radiological suspicion in penetrating injuries of the thoracic cavity, VATS for exploration would be an appropriate approach in order not to miss possible diaphragm lacerations..

Keywords: Diaphragm laceration, penetrating thoracic trauma, VATS

[OP-21]**The Effect of Meeting With International Colleagues on the Attitudes of Nursing Students Taking Pediatric Course to the Profession**

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Aim: The research was carried out to determine the effect of meeting with international colleagues on the attitudes of nursing students taking pediatric courses towards the profession.

Materials and Methods: The research is cross-sectional, descriptive and quasi-experimental. The research was carried out with 92 students who took the Child Health and Diseases Nursing course in the spring semester of the 2021-2022 academic year, Faculty of Nursing, İnönü University. Student information form and Nursing Students' Attitudes Towards Profession Scale were used to collect the research data. In the analysis of the data, mean, standard deviation, percentage and t-test for paired samples were used.

Results: The mean age of the students participating in the study was 21.347 ± 0.894 . 76.1% of the students are women and 52.2% of them live in dormitories. 48.9% of the students stated that they preferred the nursing department because they could find a job easily. Students' Attitudes Towards Profession Scale pre-test mean score was measured as 150.450 ± 15.841 , and it was seen that they had a positive attitude. After the interview with the students, the posttest mean score was determined as 158.714 ± 16.121 ($p < 0.00$).

Conclusion: It was determined that the interview with international colleagues increased the positive attitudes of the students taking pediatrics course towards the nursing profession.

Keywords: Pediatrics, nursing students, attitude towards the profession.

[OP-22]**Retrospective examination of esophageal perforations****Yucel Akkas**

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Aim: Esophageal perforations cause morbidity and mortality even in our modern world due to delays and failures in diagnosis and treatment. In this study, we wanted to retrospectively examine the patients who were admitted to our clinic because of esophageal perforation, which is a rare condition.

Material and Methods: Eight patients who applied to our clinic with esophageal perforation between May 2018 and March 2022 were retrospectively analyzed. The patients were evaluated in terms of age, gender, etiology, hospitalization time, diagnosis method, injury level, treatment method, complications, length of hospital stay, and mortality.

Results: Of the 8 patients who admitted to our clinic due to esophageal perforation, 6 (75%) were male. The mean age was 44.25 ± 10.32 (min=29, max=60). Three of the patients (37.5%) were admitted to the hospital in the first 24 hours. Etiologies were blunt trauma in 1 (12.5%) patient, gunshot injury in 2 (25%) patients, 2 (25%) patients with unclear etiology, and bone-related perforation in 3 (37.5%) patients. Cervical esophagus was injured in 4 (50%) patients, middle esophagus in 3 (37.5%) patients, and lower esophagus in 1 (12.5%) patient. While oral contrast computed tomography was used in 5 (62.5%) patients for diagnosis, oral contrast computed tomography and endoscopy were used together in 3 (37.5%) patients. While 3 (37.5%) patients presented with empyema, and 1 (12.5%) patient with mediastinitis, there were no complications in 4 patients. In the treatment, we applied conservative treatment with primary esophageal repair in 3 (37.5%) patients, endoscopic clip in 2 (25%) patients, and oral closure in 3 (37.5%) patients. Only 1 patient died due to pneumonia. All patients who developed complications were admitted after the first 24 hours. 2 of 3 patients admitted in the first 24 hours were treated with primary repair.

Conclusion: Early diagnosis and treatment are important to minimize morbidity and mortality in esophageal perforation.

Keywords: Esophagus, perforation, diagnosis, treatment

[OP-23]

Treatment management of post-traumatic pulmonary pseudocyst with rare cavitory lesion of the thorax

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Aim: In this article, 10 cases followed up with the diagnosis of posttraumatic pulmonary pseudocyst were evaluated in terms of radiological diagnosis, follow-up and treatment approaches.

Materials and methods: The data of patients diagnosed with TPP (traumatic pulmonary pseudocyst) who underwent multitrauma between January 2017 and January 2020 were retrospectively reviewed.

Results: Eight (80%) of 10 cases with pseudocyst after blunt trauma were male. The mean age of the patients was 41.1 ± 18 years. While the most common etiological factor was in-vehicle traffic accident with 6 (60%), all patients were blunt trauma patients. The coexistence of dyspnea and chest pain was the most common symptom. The mean transverse diameter of the pseudocysts was 2.35 ± 1.35 (min=1.03, max=4.89) cm. While the resorption of single pseudocysts with a transverse diameter of less than 3 cm occurred in the first 10 days, a longer period, at least one month, was required for the resorption of multiple and transverse diameters greater than 3 cm. While all patients had contusion and rib fracture, the picture was accompanied by pneumothorax in 2 patients, hemothorax in 1 patient, and hemopneumothorax in 4 patients. Bone fractures were the most common extrathoracic pathology in the patients. Extrathoracic pathology was not detected in only 40% of the patients. While 4 of the patients with TPP were followed only conservatively, tube thoracostomy was applied to 3 of them, bronchoscopy was performed on 4 patients. None of the patients needed thoracotomy. The mean hospital stay of the patients was 14 ± 20.02 (min=1, max=66) days, while the mean TPP resorption time was 25.89 ± 37.46 (min=3, max=120) days.

Conclusion: In cases with TPP, conservative treatment for symptoms and radiological follow-up of lesions are sufficient. Surgery should only be considered in cases with complications.

Keywords: Traumatic, pulmonary pseudocyst, treatment

[OP-24]

The Relationship Between Sexual Function and Sleep Problems in Women Diagnosed Hypothyroidism

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Aim: The aim of this study is to determine the relationship between sexual dysfunction and sleep problems in women with hypothyroidism and the affecting factors.

Material and Methods: This descriptive and correlational study was carried out in Kırklareli between May and December 2021. The sample of the study consisted of 157 married women who were followed up with the diagnosis of hypothyroidism. Ethics committee and institutional permission were obtained before the study. Research data were collected with the form regarding the sociodemographic characteristics, Post-Sleep Inventory (PSI), Sleep Hygiene Index (SHI) and Female Sexual Function Index (FSFI).

Results: The mean age of the participants was 45.26 ± 10.07 years, 86% had children, 22.9% had another chronic disease, and 70.7% were at risk for sexual dysfunction. The participants' PSI mean score was 6.5 ± 2.99 , their SHI mean score was 15.87 ± 7.23 and the mean FSFI score was 19.41 ± 6.97 . There was a low positive correlation between the participants' PSI and SHI score averages, and a low negative correlation between the participants' averages of PSI and FSFI. It was determined that the mean PSI score of women at risk for sexual dysfunction was significantly higher. The mean FSFI scores of women who had children, did not work, had less income than their expenses, had another chronic disease and did not exercise were found to be significantly lower.

Conclusion: The majority of women diagnosed with hypothyroidism are at risk for sexual dysfunction, and sleep problems are higher in women with risk. As sleep hygiene worsens, sleep problems increase. It is recommended that healthcare professionals perform sexual function evaluations in women followed up with hypothyroidism. In addition, sleep hygiene training should be given to those who have sleep problems and it should be considered that these people may also experience sexual function problems.

Keywords: hypothyroidism, woman, sexuality, sleep, sleep hygiene

[OP-25]

A rare case of peritonitis due to *Clostridium tertium* in a non-neutropenic patient with metastatic ovarian cancer

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Clostridium tertium is a Gram-positive, anaerobic non-toxin producing bacillus. It is seldomly a pathogen in immunocompetent patients. *C. tertium* regarding non-neutropenic patients is scarce and most of reported case is associated with intestinal mucosal disruption and gastrointestinal pathology. We present a 57-year-old woman, affected by peritonitis caused by *Clostridium tertium* following paracentesis catheter implementation.

A 57-year-old female with a past medical history of diabetes mellitus and hypertension. She was diagnosed with ovarian serous adenocarcinoma with liver and peritoneal metastases 6 months ago. After six course of treatments with paclitaxel/carboplatin was administered, a progression was detected in tomography as well as diffuse ascites and peritonitis carcinomatosis. The patient was given treatment at doses of furosemide 40 mg/day and spironolactone 100 mg/day. Although diuretic therapy was increased to the maximum dose, a paracentesis catheter was inserted due to an increase in the amount of acid. No growth was detected in the culture of 1000 cc of ascitic fluid drained from this procedure. 2 weeks after the paracentesis catheter, she presented with the complaint of widespread abdominal tenderness and fever (39.6 °C). Laboratory studies revealed a white cell count of 17,290/μL with 88% bands and C-reactive protein was level 291mg/L. A set of blood culture and ascitic fluid culture was taken due to early peritonitis diagnosis in the follow-up, and the patient was started on empiric ceftriaxone 2*1gram/day. After 2 days, the patient was taken to the intensive care unit after hypotension (TA: 70/50), pulse rate of 135/min and blurred consciousness. Although blood cultures were negative, ascitic fluid culture on admission grew gram-positive rods, identified as *Clostridium tertium* sensitive to imipenem, piperacillin/tazobactam, and chloramphenicol. Antibiotic coverage was broadened to IV piperacillin/tazobactam and vancomycin. Repeat ascitic fluid cultures also grew gram-positive rods, *C.tertium*. Subsequent cultures on 7 days after the initiation of last treatment were negative and the patient was improved. This patient was successfully treated with broad-spectrum antibiotics.

Keywords: *Clostridium tertium*, peritonitis, catheter

[OP-26]

Comparison of GGT/ALT ratio and Hepatic Fibrosis-4 (FIB-4) Score in Predicting Hepatosteatosi

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Aim: While the plague of our age is increasingly threatening the public health of obesity, the increase in obesity-related diseases has required us to increase our awareness on this issue. Sedentary life and high-calorie diet lead to abdominal obesity, dyslipidemia, hepatosteatosi and cardiovascular diseases. Hepatosteatosi can progress to liver cirrhosis if not treated. Since the definitive diagnosis of hepatosteatosi is made by invasive procedures, non-invasive markers to facilitate diagnosis were needed and various studies were conducted. .

Material And Methods: Our work; 187 patients between the ages of 18-65 who applied to the internal medicine outpatient clinic of our hospital between January 2021 and June 2022 for any reason, did not have any known chronic disease and did not use chronic medication were included. Gender, Platelet, Creatinine, CRP, Triglyceride, GGT, ALT, AST, HbA1c, TSH values were recorded, GGT/ALT ratio and Fib-4 Scores were calculated. Study data were calculated using SPSS 17.0 for Windows software (SPSS Inc., Chicago, IL, USA).

Results: The male gender distribution was significantly higher in the group with hepatosteatosi ($p<0.05$). Age, triglyceride, creatinine, HBA1C, ALT, AST, GGT and FIB4 were found to be statistically significantly higher ($p<0.05$) in the group with hepatosteatosi. The platelet count was found to be statistically significantly lower in the group with hepatosteatosi. There was no statistically significant difference in the GGT/ALT ratio between the two groups ($p>0.05$).

Conclusions: Hepatosteatosi has an important place among the comorbidities brought about by a sedentary life and high-calorie diet. For early diagnosis of hepatosteatosi, it is predicted that the detection of risky patients will reduce both morbidity and mortality. Our study has also shown that the Fib-4 score, which is among the low-cost, high-reliability markers that we can use widely in daily practice, which can predict hepatostatosi with a definitive diagnosis by invasive biopsy, is reliable in demonstrating hepatosteatosi. Contrary to the literature, the ratio of GGT/ALT, one of the hepatic fibrosis scores, did not show a statistically significant difference in our study. The relatively low number of patients or the inhomogeneity of our gender distribution may be the reason. Further studies are needed on this subject.

Keywords: Hepatosteatosi, Fib-4 Score, Hepatic Fibrosis

[OP-27]

Abdominal surgical-site abscess due to *Fusobacterium nucleatum* following right hemicolectomy and ileotransversostomy operations for colon cancer: A rare case reportID Selin Uğraklı¹, ID Muzaffer Uğraklı²¹Public Health Laboratory, Department of Medical Microbiology, Konya, Turkey²Necmettin Erbakan University, Meram Medical Faculty, Department of Medical Oncology, Konya, Turkey

75-year-old male patient applied to the emergency department with ever increasing severe right lower abdominal pain for 2 weeks. The patient had a past medical history of diabetes mellitus and coronary artery disease (placed stent twice). He had right hemicolectomy, lymph node dissection and ileotransversostomy operations 1 month previously due to newly diagnosed right colon(cecum) adenocarcinoma. The patient admitted to the emergency department with complaints of redness at the wound site, increased temperature and abdominal pain. In his examination, there was tenderness, temperature increase and defense, but no rebound was detected. Laboratory data revealed leukocytosis (19,610/ μ l) with neutrophils predominant (82.2%) and elevated C-reactive protein (218 mg/L). Advanced abdominal computed tomography (CT) scan revealed a localized abscess at the right lower abdominal scale. Prophylactic clindamycin and cefuroxime axetil were started to the patient who was taken to emergency operation. Abscess aspirate grew *Fusobacterium nucleatum* resistance to penicillin and clindamycin. No grew in blood cultures. Treatment was altered as a two-week course of IV ceftriaxone and metronidazole, according to susceptibility results, followed by four further weeks of oral amoxicillin-clavulanate. The patient successfully recovered.

Keywords: *Abscess, Fusobacterium nucleatum, anaerobe*

[OP-28]**Investigation of Change in Accurate Classification Rates by Using Richard Link Function in Logistic Regression: A Study on Determination of Risk Factors in COPD****Kürşad Nuri Baydili^{1,2}, Mustafa Çörtük³, Ahmet Dirican¹**¹Istanbul University-Cerrahpaşa, Cerrahpaşa Faculty of Medicine, Department of Biostatistics²University of Health Sciences, Hamidiye Faculty of Medicine, Department of Biostatistics and Medical Informatics³University of Health Sciences, Istanbul Yedikule Chest Diseases and Thoracic Surgery Health Application and Research Center.

In most scientific researches, it is aimed to establish a cause-effect relationship between the independent variable(s) and the dependent variable. Multivariate statistical methods are methods that analyze cause-effect relationships by taking into account the co-variation of variables. The process of explaining the relationship between independent variables and dependent variable(s) using mathematical models is performed by regression analysis. Regression analyzes; They are methods that are frequently used for purposes such as summarizing data, classifying observations, and making predictions for new observations. There are many regression analyzes that can be preferred according to the purpose of the research and various characteristics of the independent and dependent variable. Logistic regression is used when the dependent variable is qualitative (categorical). Binary logistic regression is used when the dependent variable is a two-category qualitative variable, ordinal logistic regression is used when the dependent variable is ordinal, and multinomial logistic regression is used when the dependent variable is not more than two ordinal.

Binary logistic regression is frequently used in the field of health because it deals with situations that involve two-option outcomes such as disease, mortality, and response to treatment. As a result of binary logistic regression, an S-shaped curve is obtained. However, the inflection point of this curve can sometimes correspond to values that are larger and sometimes smaller than they should be on the horizontal axis, leading to incorrect classification of observations with probability values close to 0.5. In this study; The suitability of the Richard link function was investigated in order to determine the most suitable inflection point for the observation values. In order to evaluate the performance of the Richard link function; Data were collected by applying questionnaires to a total of 1005 individuals, 500 of whom had COPD and 505 were not.

As a result of the analyzes carried out with the data of 1005 individuals; It has been determined that there is an increase in the rate of correct classification with the use of the Richard link function. For the next stage of the analysis, 74.6% of the data was divided into learning data set and 25.4% as test data set. For the learning dataset, the model obtained by using the Richard link function was applied to the test data and it was seen that it reached a higher correct classification rate than the current method.

Keywords: Logistic regression, Richard link function, correct classification rate

This research was adapted from the thesis study of Kürşad Nuri Baydili, a doctoral student at Istanbul University-Cerrahpaşa, Cerrahpaşa Faculty of Medicine, Department of Biostatistics.

[OP-29]

The Relation between Obesity Parameters and Hypertension

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Aim: Hypertension is an emerging health problem over the world, due to its related cardiovascular disease. Many reports have shown the link between hypertension and obesity in different populations. In that study, we would like to evaluate the body fat accumulation type and obesity-related parameters with hypertension.

Material and Methods: Hypertensive and normotensive individuals were enrolled from Bandırma Training and Research Hospital, Cardiology Units. The demographic data, obesity-related parameters and current health status were examined by a cardiologist. Blood pressure was measured following the recommendations of the European Heart Society. The data was accepted statistically within the 95% confidence interval ($p < 0.05$).

Results: The mean age of hypertensive and normotensive individuals was 60.25 ± 12.45 vs 57.78 ± 11.17 , $p = 0.05$, respectively. A statistically significant increase was observed in body weight, waist circumference (WC), waist-to-hip ratio (WHR), and waist to height ratio (WHtR) status in hypertensive patients compared to controls. In contrast, hip circumference (HC) measurement was only higher in hypertensive women than normotensive (110.61 ± 18.23 vs 100.69 ± 20.46) and there was no difference within men (108.56 ± 16.16 vs 107.93 ± 16.78).

Conclusion: Abdominal weight gain is an important issue for cardiovascular disease; thus, waist circumference (WC) is important to evaluate the hypertension risk more than obesity status. Hypertensive women are more prone to have an apple type body shape when hypertensive men have a pear body shape. In conclusion, body fat accumulation is an important triggering factor for hypertension more than body fat.

Keywords: Hypertension, body fat, waist circumference, waist-to-hip ratio, waist to height ratio

[OP-30]

Angiogenesis and Inflammation in Pterygium Pathogenesis

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Aim: Pterygium is one of the most common ocular surface diseases with wing appearance, degenerative and fibrovascular features. There are different approaches regarding pterygium etiology, pathogenesis and treatment. Pterygium is an active process associated with cellular proliferation, connective tissue remodeling, angiogenesis and inflammation. In this study, hypoxia inducible factor 1 alpha (HIF-1a) and Angiopoietin 1 gene expression levels were evaluated as angiogenic markers, whereas macrophage migration inhibitory factor (MIF) and toll-like receptor 1 (TLR1) and TLR2 gene expression levels were determined as inflammatory factors in pterygium pathogenesis.

Material and Methods: Two groups were included as Pterygium and Control in the study. The pterygium group was consisted of pterygium tissues (n = 49) of patients with pterygium and control group was consisted of nasal interpalpebral conjunctival tissues (n = 41) of the cataract patients without any eye problems. Biochemical parameters were evaluated by RT-PCR method.

Results: HIF-1a and Angiopoietin 1 gene expression levels were increased in the Pterygium group compared to the control group, but a statistically significant increase was observed only in Angiopoietin 1 gene expression ($p < 0.05$). In the inflammation mechanism, a nonsignificant decrease in TLR1 and MIF gene expression levels and a significant increase in TLR2 gene expression were detected ($p < 0.05$) in Pterygium group compared to Control. Histopathological examinations exerted that leukocyte infiltration and mast cell count increased significantly in Pterygium group compared to Control ($p < 0.05$).

Conclusion: It may be suggested that the increase of Angiopoietin 1 is effective in pterygium angiogenesis, while increase in TLR2, leukocyte infiltration and mast cell count are effective in pterygium inflammation. This study was supported by a grant of Mersin University Research Foundation (2018-1-TP2-2861).

Keywords: Pterygium, HIF-1a, MIF, TLR, Angiopoietin 1

[OP-31]

Childhood Traumas among Nursing Students and Associated Factors

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Aim: This study aimed to determine the level of childhood traumas among nursing students and to identify the factors associated with these traumas.

Material and Methods: 1810 nursing students studying in the nursing department of any university in Turkey were included in the cross-sectional study. Data were collected through an online questionnaire using questions including sociodemographic characteristics and Childhood Trauma Scale (CTQ-33). Approval was obtained from the ethics committee and participants for the study. In the evaluation of the data, independent sample t-test and ANOVA (F) test were used to test whether descriptive statistics and quantitative variables differed significantly, and Bonferroni test was used to see from which groups the difference originated. In addition, correlation analysis and multivariate regression analysis were performed to determine the relationship between variables.

Results: It was determined that the mean score of the childhood traumas scale of the students of the nursing department was 51.66 (± 15.45). Additionally, the mean score for each type of abuse was 11.65 (± 4.27), 10.59 (± 3.87), 8.38 (± 3.19), 8.06 (± 3.42), 6.72 (± 3.12), and 6.25 (± 3.12) for emotional neglect, overprotection/overcontrol, physical neglect, emotional abuse, physical abuse, and sexual abuse, respectively. Those who are male, do not want to reveal their gender, have a low educational level of mother and father, live in an extended family and with their relatives, have moderate and bad relationships with their parents, smoke, use alcohol, and have any psychiatric diagnosis have higher childhood trauma scale scores; It was determined that those born in the Marmara Region or any province in the Black Sea Region had lower childhood trauma scores.

Conclusion: As a result, when evaluated according to the minimum and maximum scores obtained from the scale, the level of childhood traumas of nursing students was evaluated as low. However, in the study, results that were thought to be related to the childhood traumas of the students were obtained. In this context, especially students in the risk group can be directed to activities to increase their psychological resilience. In addition, courses to increase students' awareness of the subject can be added to the nursing education curriculum.

Keywords: Nursing student, childhood trauma, abuse, neglect

[OP-32]

Use of Smart Watches/ Bands in the Field of Health: An Investigation of Studies in Turkey

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Aim: Smart watches are wearable technologies that are becoming increasingly popular and are increasingly used in the field of health. The aim of this study was to examine the use of smart watches/bands, which are becoming widespread today, in the field of health in Turkey.

Material and methods: In order to reach studies using smart watches/bands in the field of health, Google scholar and YÖK Thesis Search electronic databases were scanned. All studies since 2000 were evaluated.

Results: As a result of the search, 3 theses and 6 articles using smart watches/bands in the field of health were found. In these studies, it was seen that smart watches/bands were used to measure step count, heart rate, body temperature, skin conductivity, oxygen saturation, blood pressure and sleep quality.

Conclusions: Wearable technology, which has many uses, has a potential role in medicine. The advantages and conveniences provided by wearable technology, especially smart watches/bands, are undeniable in the field of health. However, while the use of wearable technology is gradually increasing in the globalizing world, it has been observed that studies in the field of health in Turkey are very few and limited compared to this increase. It is also very important to prove that these devices are valid and reliable before using them in the clinic.

Keywords: Smart watches, wearable technology, health, Turkey

[OP-33]

Metric and Qualitative Review of Journals in Cardiovascular Health: A View at Journals in Turkey

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Aim: There are many parameters that show the quality of a journal. The databases (such as Web of Science, Pubmed, MEDLINE, EMBASE, SCOPUS) that increase the visibility of the journal are indexed, quartile, impact factor of the journal, H index, number of readers and number of regular publications are some of them. The aim of this study was to examine the metric and qualitative characteristics of cardiovascular health journals originating from Turkey.

Material and methods: According to the results of a search conducted on the Web of Science and TR-DİZİN database to meet the categories of cardiovascular surgery, cardiology and cardiovascular system, the H index, impact factor and quarter of the Web of Science indexed journals were analyzed. In addition, the distribution of the publications of the journals in 2020 and 2021 according to the types were examined.

Results: As a result of the analysis, a total of eight journals originating from Turkey were reached. Two of these journals were scanned in SCIE, one in ESCI, and eight in TR-INDEX. One of the journals was in the Q3, three of them were in the Q4 quartile. When the types of articles published by the journals were examined, the highest numbers were original articles (557), review (73) and case reports (247) respectively. Apart from these article types, there were other publication types (316) belonging to journals. When the publications were analyzed by subject type, it was seen that although there were a wide variety of patient groups (atrial fibrillation, heart failure, myocardial infarction, etc.), the publications on adults and non-surgical methods were concentrated.

Conclusions: Examination of scientific journals gives researchers and academicians an idea about the distribution of publications in their fields and the characteristics of journals. In our study, the characteristics of cardiovascular health journals and scientific publications in these journals are presented.

Keywords: Journal, cardiovascular, Turkish

[OP-34]**A New Intraocular Lens Implantation Technique In Aphakia Without Capsular Support: Sutureless Iris Fixation Of Three-Piece Posterior Chamber Intraocular Lens**

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When the lens capsule support is not considered sufficient in cataract surgeries, the intraocular lens cannot be placed in the capsule. In this case, the physician to provide visual rehabilitation; an anterior chamber lens, iris clamp lens, or scleral fixation lens should be preferred. These three intraocular lens placement techniques have advantages and disadvantages over each other.

Studies on this subject; focus on the development of alternative surgical methods and surgical instruments that will be easier, safer, and less traumatic for the placement of the intraocular lens. This study, it was aimed to describe a new intraocular lens placement technique that can be applied in the same surgery or a second surgery for eyes with aphakic aphasia without capsular support, which enables sutureless fixation of the standard three-piece posterior chamber intraocular lens to the iris.

For this technique we described, standard surgical instruments available in all operating rooms were used; There is no need to widen the corneal incision or open a new incision. Being a much easier method than iris clamp lenses, it is advantageous over scleral fixation techniques since it does not require the use of sutures. The fact that the technique we apply does not cause any complications during and after the surgery and can be applied with easy, cheap, and accessible equipment shows its clinical importance. In this study, we wanted to present three cases in which we operated using the intraocular lens placement technique, which was first described by us. We think that the importance and ease of the technique will be better understood with larger case series and it will benefit many clinics.

Keywords: Intraocular lens, iris fixation lenses, anterior chamber lenses, secondary intraocular lens.

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