



GLOBAL MIGRAINE & PAIN SUMMIT

4th MENA Meeting &

2nd Turkish African Meeting of Headache and Pain Management

October 28-31, 2020
Virtual Congress



5 Languages
Simultaneous
Translation

ONLINE ABSTRACT BOOK

ORAL PRESENTATIONS

OP 1 Comparison of Perceptions and Beliefs Related to Headache of Adolescents with Episodic Migraine Diagnosed with Attention Deficit Hyperactivity Disorder and Generalized Anxiety Disorder

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Background: Psychiatric comorbidity often complicates headache treatment regardless of child, adolescent or adult and can lead to poor prognosis during the treatment process. Moreover, it is known that adult headaches begin to a great extent during childhood or adolescence. On the other hand, how individuals perceive their illness or what kind of beliefs they develop are determinant in the quality of life, quality of cognitive, emotional and behavioral response to treatment.

Method: Adolescents admitted to Mersin University Child and Adolescent Mental Health and Diseases outpatient clinic with the complaint of headache and was diagnosed as episodic migraine (EM) according to the diagnostic criteria of The International Classification of Headache Disorder 3rd edition beta version by the neurologist were examined. Samples are between 12-18 years old and they had been chosen among 170 adolescents. By the psychiatric assessment performed by the child and adolescent psychiatrist by considering the DSM-V diagnostic criteria, 19 adolescents with attention deficit hyperactivity disorder (ADHD) and 25 adolescents with generalized anxiety disorder (GAD) were included. In addition to the diagnosis of EM, it was intended to compare the perception for migraine and pain beliefs of adolescents with ADHD or GAD. In order to determine socio-demographic information and developmental/psychiatric features a 'Patient Assessment Form', 'Headache Questionnaire Form' to determine pain-related features, and 'Disease Perception Scale' to measure

adolescents' perception of migraine and beliefs about headache were performed.

Results: Adolescents with GAD and EM perceive migraine as a more chronic, very serious and negative resulting emotionally damaging disease and try to identify and better understand their disease than adolescents with ADHD and EM. The perception of those with ADHD that they can control their headaches is more positive than adolescents with GAD.

Conclusion: In order to achieve more enlightening results, it is recommended to conduct studies examining various child and adolescent psychopathologies that commonly accompany migraine at different developmental stages and cognitive and emotional attitudes towards migraine in larger groups.

OP 2 Risk Factor for White Matter Lesions Detected in Migraine Patients

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Background: It is known that cerebral magnetic resonance imaging of white matter lesions (WML) is more common in migraine patients compared to normal population. It has been suggested that WML, which is generally silent and does not constitute a prominent clinic, is associated with cognitive impairment and stroke, but the relationship and clinical significance of WML with migraine has not been clearly explained. The aim of this study was to evaluate the risk factor for WML in migraine patients.

Method: Two groups of 63 patients with WML and without 64 patients with migraine who met the International Headache Association diagnostic criteria were included in the study. Age, gender, smoking, frequency of attacks, duration of attacks, aura, nausea, vomiting, photophobia, phonophobia which were thought to be risk factors between the two groups were questioned; hypertension (HT), instant systolic and diastolic blood pressure measurements were evaluated.

Results: As a risk factor for WML, increasing the age of 1 year increased the risk of lesions by 1,090 times. The risk of lesion women was found to be 3,404 times higher than men. The frequency of attacks had a significant effect on the risk of lesions, frequency of attacks and the risk of lesions increased by 5,870 times compared to those with single-attack frequency. The risk of lesion HT was 4,784 times higher than non HT.

Conclusion: In this study, the relationship between migraine and WML was evaluated as advanced age, female gender, frequency of attacks, and HT posed a risk for WML development with statistically significant results.

OP 3 Prevalence Of Primary Headache And Factors Associated With It Among Rift Valley University Adama Campus students, 2019

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Background: Headache is a common chronic neurologic disorder with huge economic and psychosocial impact. In comparison with other health problems, there is a limited data on primary headache, especially from sub Saharan Africa including Ethiopia. Therefore, the aims of this research were to assess prevalence of primary headache and associated factors among Rift Valley University Adama Campus Students.

Method: Participants selected using Quota sampling from three faculties of Rift Valley University, Adama. An interviewer administered questionnaire developed by reviewing related literature and Headache-attributed restriction, disability, social handicap and impaired participation (HARD-SHIP) questionnaire and used to collect the data. STATA 12 was employed for data cleaning and analysis. Variables with a P-value of 0.25 and below on the bivariate regression were considered for Multivariate analysis. Finally, a P-value < 0.05 was considered as statistically significant.

Results: A total of 240 students were participated. The mean age of the student's was 23.5 ± 2.4 years, 57.5% of them were female, 85.4 single and 67.50% of them were urban dwellers. Almost all, 97.9% of the respondents experienced headache in their lifetime and 61.3% within the last 30. Among those who experienced headache 69 (28.75%) of them had a primary type headache. Forty-one (17.1%) of the respondent's fulfilled the criteria for tension type headache, 28 (11.7%) migraine and 155 (64.58) had unclassified. After controlling possible confounding effects of other covariates: age 23-28 year [AOR:3.52,95% CI=1.69,7.23], students from business faculty [AOR:0.30,95% CI=0.11,0.79], being from rural areas [AOR:2.13,95% CI=1.04,4.35], had history of nausea and vomiting [AOR:8.49,95% CI= 3.12,23.15] and bothered by bright light [AOR:2.15,95% CI=1.30,3.57] had a significant association with primary headache.

Conclusion: Headache is a common complaint among Rift Valley University Adama Campus students and it limits the daily activity of majority of the sufferers. Student's need proper education about treatment to ease their suffering and forestall complication.

OP 4 Post Dural Puncture Headache Changes Headache Characteristics of Chronic Headache

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Background: There are limited data about the incidence of chronic headache and other symptoms of postdural puncture headache (PDPH). We aimed to determine the incidence of chronic headache in patients who had PDPH after cesarean section (ACS) under spinal anesthesia.

Method: This study included the data of 33 patients who had treated for PDPH with Theophylline infusion or epidural blood patch in our Algology clinic from December 2014 to July 2019. Thirty-one patients were contacted and a survey questionnaire was administered for chronic (>6 months) headache, the numeric rating scale (NRS), using attack medicines and associated symptoms (allodynia, nausea and vomiting, photophobia and phonophobia, premonitory symptoms and headache characteristics) which have developed following PDPH. Patients who had chronic headache before cesarean section (BCS) were also asked for previous complaints.

Results: Ten (32.3%) participants were already had chronic headache BCS. Differences noted before and after PDPH [consecutively; allodynia n:4-n:7(40%-70%), premonitory symptoms n:3-n:4(30%-40%), nausea-vomiting n:5-n:6(50%-60%), photophybia-phonophobia n:4-n:5(40%-50%), ≥3 attack medicine use in a month n:5-n:8(50%-80%)]. NRS score changed 3.5 to 4 (p<0.001) Six participants (19.4) developed chronic headache after PDPH. Four (66%) patients has allodynia, 1 has premonitory symptoms, 2 has nausea-vomiting, 2 has photophyphia-phonophobia, 4 has ≥3 attack medicine use in a month. NRS score was 4.06 in patients who had chronic headache after PDPH.

Conclusion: The headache characters of patients with chronic headache may change with PDPH. Our findings indicated that chronic headache may develop after PDPH. Prospective randomized controlled studies with large sample sizes are needed.

OP 5 Vitamin D3 Might Protect Against Inflammation in Migraine: Post Hoc Analysis of a Randomized Clinical Trial

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Background: Although the exact mechanism involved in migraine pathogenesis remained uncertain, different researches have been developed to address the role of neuro-inflammation. Thus, due to anti-inflammatory effects of vitamin D3, we aimed to explore the effects of supplementation with this vitamin on serum levels of pro/anti-inflammatory markers in migraineurs.

Methods: This placebo-controlled, double blind study included 80

episodic migraineurs who randomly assigned into two equal groups to receive either daily dose of vitamin D3 2000 IU or placebo for 12 weeks. Serum levels of interleukin (IL) -10, IL-6, inducible nitric oxide synthase (iNOS) and cyclooxygenase-2 (Cox-2) were assessed at baseline and after the trial using ELISA method.

Results: Using ANCOVA adjusted for baseline levels and confounding variables, it was found that serum levels of IL-10 and Cox-2 did not significantly differ between groups after the experiment; whereas. iNOS serum level was significantly reduced in the intervention group (106.06U/L) comparing to the controls (156.18U/L $P<0.001$). Also, the patients receiving vitamin D3 yielded a marginally-significant lower IL-6 serum concentration (76.43ng/L) compared to placebo (93.10ng/L) ($P:0.055$). The Pearson correlation analysis indicated significant negative correlations between changes in serum 25-hydroxy-vitamin D and both IL-6 changes ($r=-0.327$, $P:0.004$) and iNOS changes ($r=-0.278$, $P:0.016$).

Conclusion: Based on the results of this study, we found that 2000 IU/day vitamin D3 supplementation for 12-week might reduce neuro-inflammation in episodic migraine. It was also revealed that elevation in serum 25-hydroxy-vitamin D levels accompanied decreases in IL-6 and iNOS levels throughout the trial. However, more studies are required to confirm these findings.

OP 6 Are There Differences in Brain Microstructure in Migraine with and Without Aura: a Diffusion Tensor Imaging Study

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Background: Migraine is a heterogeneous disease. In 20% of cases, reversible focal neurological symptoms accompany migraine headaches (Migraine with aura-MWA). In recent years, the question has arisen that MWA and migraine without aura (MWOA) may be two separate entities. White matter microstructural changes have been reported via Diffusion tensor imaging (DTI) in MWA. However, there was no difference in diffusion parameters between MWA and MWOA. A recent study found that migraine patients had less cerebellar peduncle volume. We aimed to compare brainstem and cerebellar peduncles between MWA and MWOA, as well as to determine the relationship between changes in these structures with pain severity and migraine disability.

Method: Patients were recruited from our outpatient clinic and diagnosed with MWA and MWOA based on the International Classification of Headache Disorders 3rd edition criteria. We compared microstructural changes in cerebellum and brainstem using DTI between 23 MWOAs and 17 MWA. Visual analog scale (VAS) and migraine related disability scale (MIDAS) were applied to patients.

Results: The mean age of participants was $35,43 \pm 8,03$ years, VAS score was $9,05 \pm 1,06$, MIDAS score was $2,93 \pm 1,02$. Cerebellar peduncles and brainstem values compared between MWA and MWOA patients, there was no significant differences. VAS scores were correlated with medial lemniscus, MIDAS scores were correlated with pontine cross.

Conclusion: In our study which we aimed to find out cerebellar and brainstem microstructural abnormalities between MWA and MWOA patients, there was no significant difference, but we found a relationship between brainstem and perception of pain. More studies are needed on this subject.

OP7 The Prevalence Of Migraine Comorbidity In Idiopathic Epilepsy Syndromes: The Preliminary Results Of A Multicenter Study Across Turkey

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Background: Migraine and epilepsy are common episodic and chronic neurological disorders, both associated with cortical hyperexcitability. In this preliminary report of a multicenter prevalence study, we aimed to investigate for the first time the prevalence of migraine in patients diagnosed with idiopathic epilepsy syndromes and its clinical associations.

Method: We administered face-to-face structured questionnaires evaluating their epilepsy and investigating the presence of headache as well as its characteristics, to the patients with idiopathic epilepsy between 6-40 years old and a minimum follow-up of one-year. Migraine was diagnosed and classified according to the International Classification of Headache Disorders criteria.

Results: Among the 377 patients (254 women) with a mean age of 25.2±8.9 years, 205 (54.4%) were diagnosed with migraine. The distribution of headache diagnosis according to migraine subtypes were as follows; 104 (27.6%) with migraine without aura (MwoA), 82 (21.8%) with migraine with aura (MwA), 1 (0.3%) with migraine with brainstem aura; 2 (0.5%) with chronic migraine; 10 (2.7%) with probable MwoA; 6 (1.6%) with probable MwA.

103 of 179 (57.5%) patients with juvenile myoclonic epilepsy (JME) had migraine; being MwA in 50 (48.5%), MwoA in 52 (50.5%) and other type of migraine in one patient (1%). Migraine was also prevalent in patients having idiopathic generalized epilepsies (IGE): 48 of 95 (50.5%) patients with IGE experienced migraine (MwA in 15 (31.2%),

MwoA in 27 (56.2%) , other types of migraine in 6 patients (12.5%).

Conclusion: In this multicenter study we found a high comorbidity of migraine in idiopathic epilepsy syndromes, especially in patients with JME or IGE. Clinicians should be aware of the comorbidity of migraine and idiopathic epilepsies and target the management of both diseases.

OP 8 Servical And Ocular Vestibular-Brainstem Evoked Potentials In Vestibular Migraine And Classical Migraine

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Background: To analyse the vestibular system by cervical-ocular vestibular evoked myogenic potential (cVEMP, oVEMP) responses to air-conducted sound (ACS) by brainstem auditory evoked potential(BAEP) responses in classical migraine (CM) , vestibular migraine (VM) to determine if the elicited responses can be helpful in the differential diagnosis.

Methods: 20 CM,20VM and 20 healthy patients included. Outcome parameters for cVEMP and oVEMP examinations were latency, amplitude of P13- N23 and N1- P1 waves, interpeak-interaural amplitude, latency differences. From the BAEP graphs, interpeak interval latencies of waves were analyzed. Statistical significance was set at $p < 0.05$.

Results: VEMP responses were detected in all control group. Patients both in VM and CM groups showed unilateral or bilateral absent VEMP responses. In regards to cVEMP, P13 and N23 latencies and amplitudes after rectification did not differ significantly among groups. In the CM group exhibited significantly higher p12-n23 peak to peak amplitude asymmetry ratio determined Amplitudes of N1-P1 were lower than in other groups. In regards to BAEP and audiometry assessments, interpeak interval latencies and thresholds did not differ significantly among groups.

Conclusion: This study provides the evidence that abnormalities of VEMP responses can be observed both in VM and CM patients. Amplitude asymmetry ratio can be used as a parameter to differentiate VM from CM.

OP 9 The Prophylactic Effectiveness Of Transcranial Direct Current Stimulation In Migraine Patients In Relation To Allodynia: A Randomized Controlled Double-Blind Study

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Background: Allodynia is related to central sensitization that affects even simple daily living activities and increases the tendency for migraine to be more resistant to treatment and chronicity. Migraine impairing quality of life, can often be treated with variable pharmaceutical agents, but with various side effects. Transcranial direct current stimulation (TDCS) is a potential alternative treatment for migraine prophylaxis.

Methods: Seventy-seven patients diagnosed with migraine (48 with allodynia and 29 without allodynia) were included in the study. 41 of the 77 patients received sham stimulation and 36 patients underwent three sessions of anodal left primary motor cortex stimulation for 2 mA, 20 minutes. Drug use and migraine attack characteristics (frequency, severity, duration) were followed for one month after the stimulation.

Results: After TDCS, symptomatic drug use ($p=0,007$), attack frequency ($p=0,021$), number of headache days ($p=0,005$) and duration of attacks ($p=0,008$) decreased in patients receiving active stimulation. Response to TDCS treatment was higher in patients without allodynia (60% vs. 24%; $p=0,028$) and allodynia came out as an independent predictor of response to TDCS with logistic regression analysis. Side effects were rare and similar to the sham group.

Conclusion: TDCS is a safe, efficacious and fast method for migraine prophylaxis. However, administration of TDCS before allodynia occurs, which means before the development of central sensitization, will provide more effective treatment responsiveness.

OP 10 Headache In Patients With Chronic Obstructive Pulmonary Disease: Effects Of Pulmonary Function Parameters

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Background: Chronic obstructive pulmonary disease (COPD) is a disease characterised by airflow limitation. Hypoxaemia-related headaches are long-recognised conditions. However, the clinical importance of that and the relationship between COPD are not well understood.

Aim: We performed this cross-sectional clinical-based study in order to determine the characteristics of headache and its relationship with pulmonary function test (PFT) in COPD.

Method: COPD patients ($n=100$) and healthy control patients ($n=100$) were included in the study. Sociodemographic and disease characteristics of patients were questioned. Oxygen saturation was measured. Headache types were diagnosed according to ICHD-III. Visual analog scale (VAS) and headache-restricted activities assessment scale (HRAA-S) were applied. COPD severity was assessed with modified medical research council (mMRC) scale. PFT was performed 3 times and best values were included. Forced expiratory volume in 1s (FEV1), forced vital capacity (FVC), FEV1/FVC and residual volume (RV) were recorded. Data were analyzed with SPSS 21.0 package software.

Results: 100 patients (15 females, 85 males) were included in the study. The mean age was 64.6 ± 11.6 years. Frequency of headache, score of VAS and HRAA-S were higher in COPD ($p=0.01$). Tension-type headache was higher in COPD ($p=0.03$). Other headache types were similar in COPD ($p>0.05$). There was no difference between PFT and oxygen saturation with type of headache in COPD ($p>0.05$). Also, there was no correlation between COPD severity and headache characteristics.

Conclusion: The frequency of headache (especially tension headache) is higher in COPD patients. Headache is not associated with PFT and oxygen saturation.

OP 11 Sleep Quality is Poor in Patients with Chronic Migraine

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Backgrounds: Migraine attacks can be triggered with some situations like emotional stress, fasting, odours, and sleep disturbances etc. Sleep complaints have been identified frequently in patients with migraine. In this study, we aimed to evaluate the sleep characteristics of patients with chronic migraine at Mersin University.

Methods: 50 volunteer individuals with chronic migraine aged 18-75 were included in the study. For chronic migraine diagnosis, it was used the International Classification of Headache Disorders, 3rd edition (ICHD-3) diagnostic criteria's. The sleep disorders of patients were evaluated by "Epworth Sleep Scale" and "Pittsburgh Sleep Quality Scales" (PSQI).

Results: The average age of the patients was 41.9(± 12.2) and 90% of them were female patients. Patients' sleep latency was 35.4(±37.7) min, their sleep time was 6.3(±1.9) hours, morning awakening time was 7.12 (±1.37) hours, and sleep efficiency was 84.8% (±18.9). The sleep quality of all patients was poor. Again, in 14 (28%) of migraine patients, increased daytime sleepiness was detected. In addition, patients experienced problems such as feeling cold or hot during sleep, snoring loudly, and having bad dreams.

Conclusion: Sleep quality was poor with varying degrees in all patients. Difficulty falling asleep and maintaining, increased daytime sleepiness were the main problems of the patients. Sleep problems should be questioned separately in every migraine patient. Because, highlighting the relationship between migraine and sleep disorders is important to improve treatment strategies and to understand of migraine pathophysiology more a lot.

OP 12 The Relation Between Morning Headache and Obstructive Sleep Apnea

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Background: Morning headache is considered as a symptom of Obstructive Sleep Apnea (OSAS). Although Morning headache (MH) is not as common as other symptoms such as snoring, witnessed apnea and unrefreshing sleep, it can also impair daily activities. We aimed to investigate the prevalence of MH and assess other OSAS symptoms and risk factors among patients referred to the sleep laboratory.

Method: The study was conducted in the sleep center of the Erenköy Training and Research Hospital. Clinical and polysomnographic data on 200 patients with diagnosis of OSAS who underwent polysomnography were collected retrospectively.

Results: Baseline characteristics and clinical data were shown in Table 1. Among 200 patients, 56 patients (28 %) had MH. Female patients were more common in patients with MH. Unrefreshing sleep, daytime sleepiness, night sweat, attention deficit, and cognitive impairment were significantly more common in patients with MH. Epworth score was significantly higher in patients with MH (Table 3). Multivariate logistic regression analyses showed that unrefreshing sleep, night sweating, attention deficit were independently predictors of MH.

Conclusion: Although there was no association between severity of OSAS and MH, some OSAS symptoms were more common in patients with MH. Further prospective studies are needed to validate our results.

OP 13 Primary Headache Associated with Sexual Activity

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Background: Primary Headache associated with sexual activity (HSA) is also known as sexual/intercourse headache, coital or (pre) orgasmic cephalalgia. It is generally rare type of headache mostly in male gender and starts at third-decade of life. Intracranial pathologies should be evaluated on differential diagnosis.

Methods: Patients followed up at the Headache outpatient clinic of Health Sciences University, Erenköy Mental and Neurological Diseases Training and Research Hospital and Siirt State Hospital were determined due to ICHD-3 criterias(2018). Patients with sex-related headache were investigated by detailed neurologic examination, cranial computerized tomography, cranial magnetic resonance imaging and angiography. Patients with any secondary reasons for headache were excluded.

Results: Primary headache associated with sexual activity were diagnosed in 6 male and 1 was female patients. Among these, five patients had the pain on occipital area and upper neck only started following coitus, most intense at orgasm and not responsive to etodolac treatment. Two of them with the symptoms located at the temples bilaterally and occipital area during sexual intercourse. Two of the patients had the history of migraine. Their neurological evaluation and neuroimaging was normal. They were treated with indomethacin 25mg/day 30 minutes before the intercourse and seen that the ache had improvement and VAS scores decreased.

Conclusion: Even though the pathophysiology is still unknown, it is a benign process and a diagnosis of exclusion. Prognosis is good and should be explained to the patient for increasing the quality of lives. Herein we presented a rare case series to highlight the importance of differential diagnosis.

Keywords: primary headache, sexual activity, indomethacin, headache

OP 14 Comparison of The Triggers In Migraine Versusu Epilepsy: A Survey Study In Neurology Outpatient Clinics

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Background: Similar factors may trigger the attacks of patients both with migraine and epilepsy; however, there are no studies comparing those triggers with the same protocol. We aimed to investigate the triggers of epilepsy and migraine attacks with a standardized questionnaire to reveal the overlapping and differing factors.

Method: Epilepsy and migraine patients diagnosed by neurologists were included in the survey.A comprehensive and standardized query form that questioned face to face many situations like emotional and physical stress, audiovisual stimuli, mental and physical activities which can trigger or suppress attacks, was applied by a neurologist. The groups were compared statistically.

Results: The results of 96 patients with epilepsy (56 F; mean age:32.1±9.87) and 94 patients with migraine (61F; mean age: 35.2±10.53) were analyzed. Although stress (59.4% and 83%) (p<0.001) and lack of sleep (62.5 % and 75.5%) were the most commonly reported two triggers in both groups, migraineurs were more sensitive to many stimuli. The only trigger that was seen at a significantly higher frequency in epilepsy group (30.2%) was "awakening" (p<0.001).On the other hand, 18.1% of migraineurs reported that they could inhibit their attacks; while most of the epileptic patients (94%) could not prevent their attacks.

Conclusion: Our comparative study design showed that migraineurs were more "sensitive" to external and internal stimuli,for the first time in the same survey. Our research draws attention to the importance of informing patients regarding the trigger detection and strategies for attack inhibition. Further studies are required exploring attack precipitation and prevention.

OP 15 Theory of Mind and Metacognitive Abilities In Migraine Patients

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Background: Emotional dysregulation, difficulties in mentalization and metacognition in headaches has gain interest recently. Though the theory of mind (ToM) and metacognitive abilities have not been studied in adult migraine patients.

We aimed to test the hypothesis that theory of mind and metacognitive abilities were disturbed in patients with migraine.

Methods: 42 migraine without aura (MwoA) patients (1.2, ICHD-3), and 30 healthy controls (HCs) were enrolled. Of the patients, 22 had episodic and 20 had chronic migraine. Depression and dementia diagnoses were excluded in all participants. In order to evaluate theory of mind skills and metacognitive abilities, Dokuz-Eylül Theory of Mind Scale (DEToMS), Reading Mind in the Eyes test and Metacognition Scale were performed by the MwoA patients, during an attack-free period, and HCs. Patient and control groups were similar in terms of age, gender, and educational characteristics.

Results: There were no differences between patient with MwoA and the control group in metacognitive abilities. However, patients with MwoA had statistically significant lower scores from HCs in ToM tests. In addition, when chronic and episodic migraine groups were compared in terms of ToM scores, lower ToM skills were found in the chronic migraine group.

Conclusion: Our data point to the existence of TOM problems in migraine, particularly notable in chronic migraine patients. Approach to manage migraine has to include low TOM skills in migraine patients.

OP 16 Interstimulus Interval Change of Paired Somatosensory Stimulus on Cortical Evoked Potentials

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Background: Migraine headache is a complex disease associated with dysfunction in the processing of multiple sensory information. Recently somatosensory temporal discrimination was reported to be remarkably prolonged during migraine attacks. We aimed to study the change of somatosensory evoked potentials (SEP) in relation to the interstimulus interval (ISI) alterations of paired median nerve stimulation.

Methods: Median nerve was electrically stimulated and subsequent SEPs were recorded by a glass electrode inserted into the primary somatosensory cortex in male Wistar rats (200-250g), under urethane (1200mg /kg, ip) anesthesia. Paired somatosensory stimuli was applied with 35, 50, 80, 140 and 500 ms ISI values. The data was also analyzed in different frequency bands including high frequency oscillations (HFO).

Results: The duration and latencies of the second response weren't significantly different than the first response in all ISI values. A reduction in amplitude was observed for the second response in short ISI, whereas it was observed to be high in higher ISI values. The ratio of 2nd/1st response was close to 1 in 500 ms ISI. The Integral of 2nd response to 1st response was significantly different in 150-400 Hz band for all ISI values but 500 ms. The integral of early HFO of 2nd response was significantly different from the 1st response in 51-150 Hz, 150-400 Hz and 400- 800 Hz band, in all ISI values but 500ms.

Conclusion: The processing of 2nd sensorial responses are dependent on ISI values. Early HFO changes without accompanying late HFO alterations, indicate thalamic drive to cortex plays a major role in

determining the 2nd response in low ISI values.

OP 17 Comparing the Efficiency of Treating Chronic Migraine Patients with Great Occipital Nerve (GON) Block and GON Block and Trigger Point Injection (TPI) Combination

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Background: Greater occipital nerve (GON) blocks and trigger point injections (TPI) were found useful for chronic migraine (CM) prophylaxis with varying effect sizes and durations, but there isn't a standard protocol regarding treatment frequency and dosages. In this study, we aimed to compare the efficiency of GON block and GON block and TPI combination for CM prophylaxis.

Methods: This study is conducted between May 2019-January 2020 at SBU İzmir Bozyaka Training and Research Hospital Headache Outpatient Clinic. Ten patients diagnosed as CM according to ICHD-3 criteria included. The patients' demographic data and migraine disease characteristics were noted from medical records and headache diaries retrospectively. Five patients who were treated with GON block (group A) for 3 months and 5 patients who were treated with GON block+ TPI (group B) combination for 3 months were chosen.

Results: There were no statistical differences between the two groups' in average age and disease duration (p:0,908-p:0,935). When we compared Group A and Group B's results before and after blocks according to average headache duration, headache severity and headache frequency both groups showed significant decreases after GON block and TPI (p<0,001). When group A and B compared according to the average VAS score; group B's score was significantly lower than group A. On the other hand, average headache frequency and headache duration were not statistically different between the two groups (p: 0,768- p:0,982).

Conclusion: This study shows GON block and GON block+TPI is effective for CM prophylaxis, combining TPI with GON block may be considered for decreasing the severity of migraine attacks.

OP 18 Occipital Neuralgia Secondary To Multiple Sclerosis: A Case Series And Literature Review

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Background: According to the International Headache Society, occipital neuralgia (ON) is defined as paroxysmal stabbing pain in the distribution of the greater and lesser occipital nerves. Possible causes of ON are related to neurogenic, vascular, muscular, and osteogenic injuries. Demyelination of the central myelinated part of the nerves is accused in the mechanism of neuralgiform pain in multiple sclerosis (MS). The prevalence of trigeminal neuralgia in MS is well documented; however, there is limited data regarding the prevalence and clinical presentation of ON in patients with MS. We aimed to determine the frequency of ON in MS and to report clinical presentation and neuroimaging findings.

Methods: The patients with MS diagnosed with ON between January and December 2019 were noted prospectively.

Results: During the study period, out of 457 patients with MS, 7 patients (6 female, 1 male) were diagnosed with ON. Two patients had a secondary progressive course, while 5 patients had a relapsing-remitting course. ON was the initial symptom in 2 patients, while 1 patient was presented with MS relapse. Two patients had ON after progression, and 3 had ON without disease activity (no new-onset MRI findings or other neurological symptoms). Six patients had the presence of a C2-3 level demyelinating lesion. All patients had an ipsilateral great occipital nerve block with a mixture of 3-4 mL of 2% lidocaine and 1 mL of methylprednisolone acetate with successful treatment response.

Conclusion: ON is a rare type of headache among patients with MS. MS patients with sudden paroxysmal occipital pain need to be examined for cervical lesions.

OP 19 Sulfotransferase Inhibitors in the Pathophysiology of Migraine

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Background: Certain constituents in migraine food triggers and non-steroidal anti-inflammatory drugs (NSAIDs) inhibit sulfotransferases (SULTs) that detoxify drugs/chemicals and play role in the metabolism of neurotransmitters. We hypothesized that SULT1A inhibition is a common mechanism by which food triggers and NSAIDs modulate migraine susceptibility, in a way that to explain food triggers of migraine attacks and medication overuse (MO) headache. Our goal was to investigate SULT1A1 involvement in MO and migraine triggers and to observe how cortical excitability and behavior is altered in MO after exposure to a trigger.

Methods: Hesperidin was used as SULT1A inhibitor found in orange juice, a migraine trigger and mefenamic acid (NSAID), another SULT1A inhibitor, was used to induce MO in rats. The groups were; 1) Hesperidin(ip) or its vehicle-DMSO(ip) 2) Chronic(4 weeks) mefenamic acid(ip) or its vehicle(ip) 3) Chronic mefenamic acid+hesperidin(ip) or DMSO(ip). CSD susceptibility was evaluated and behavioral testing was performed. SULT1A1 enzyme activity was measured in brain samples.

Results: Single-dose of hesperidin neither changed CSD susceptibility nor resulted in any behavioral change. Chronic mefenamic acid exposure resulted in increased CSD susceptibility, mechanical-thermal hypersensitivity, increased head shake-grooming and decreased locomotion. Hesperidin administration after chronic mefenamic acid exposure resulted in increased CSD susceptibility and mechanical -

thermal hypersensitivity and decreased locomotion. SULT1A1 enzyme activity was lower in mefenamic acid group and mefenamic acid+hesperidin group compared to their vehicles.

Conclusion: Mefenamic acid and hesperidin have synergistic effect in modulating CSD susceptibility and pain behavior. SULT1A inhibition may be the common mechanism by which food triggers and NSAIDs modulate migraine susceptibility.

Acknowledgement: DV was supported by a Fellowship from the International Headache Society.

OP 20 Chronic Headache, Comorbidities, Lifestyle and Treatment modalities in an Adolescent Population

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Background: Headache is a common complaint in childhood and adolescence and is observed in 88% of this population. The rate of chronic headache in children and adolescents is seen between 1-4% . Headaches are routinely divided into two as primary headache (migraine, tension headache, cluster headache, etc.), in which complex and genetic and environmental factors are effective together, and secondary headache that develops due to a cause such as infection, inflammation, or intracranial tumor. When headache becomes chronic, it affects quality of life, school performance and active social life negatively in children and adolescents. With this study, we aimed to investigate the socio-demographic data in adolescents with chronic migraine and tension headache, obesity, nutritional habits, physical activity, lifestyle, tablet / phone usage characteristics, comorbid psychiatric symptoms and their effectiveness.

Method: Patients between the ages of 12 and 18 who applied to the Recep Tayyip Erdoğan University Faculty of Medicine, Neurology Outpatient Clinic between January 2018 and January 2019 were included in the study. Patients and control group with normal physical and neurological examination findings who have chronic migraine and chronic tension headache diagnosed according to the criteria of ICHD-III (The International Classification of Headache Disorders Second Edition) published by the International Headache Society. is included. PEDMI-DAS ((Pediatric Migraine Disability Assessment Score) and anthropometric measurements were performed, which rated the sociodemographic form of patients, headache and disability in children and adolescents. The patients and their families were later evaluated by the child psychiatry.

Results: Medication overuse headache was high in chronic migraine group. Depression and anxiety level was high in chronic tension type headache. High depression score and body mass index was a predictor of more headache disability.

Conclusion: High depression score and body mass index was a risk factor that was associated and worsening of headache in adolescence.

OP 21 Effectiveness of Greater Occipital Nerve Blocks in Chronic Migraine

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Background: Chronic migraine (CM) is defined as headache occurring on 15 or more days per month for more than three months, which, on at least 8 days per month, has the features of migraine headache. Greater occipital nerve (GON) blocks with local anesthetics and steroids are used in CM. GON block is widely used effectively in CM treatment. In this study, our aim was to test the effectiveness of GON blocks in CM.

Method: This retrospective study was conducted in Bulent Ecevit University Faculty of Medicine, Department of Neurology. Data from CM patients who had GON block were collected. CM was diagnosed using International Headache Society (IHS) classification. Data of 44 patients were analyzed. GON blocks were repeated every week in the first month (1st, 2nd, 3rd, 4th week) and repeated monthly for the following 6 months. The injections were performed radially at 2 cm lateral and 2 cm inferior to the protuberantia occipitalis externa with a needle and 2 mL of 0.25% bupivacaine bilaterally. Headache attack frequency and severity were compared between before GON block and after GON block in first month.

Results: Headache attack frequency decreased from $12,8 \pm 8,4$ (pretreatment) to $3,8 \pm 3,5$ (first month) ($p < 0.001$). Headache severity (VAS) decreased from $8,5 \pm 1,2$ to $4,5 \pm 1,8$ (first month) ($p < 0.001$).

Conclusion: This study showed significant decreases in headache parameters in CM. GON block is widely used effectively in CM treatment, and there is a need to standardize the application technique, dose, and frequency.

OP 22 The Reversibility of the Imaging Findings in Idiopathic Intracranial Hypertension

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Background: Idiopathic intracranial hypertension is characterised with increased pressure of cerebrospinal fluid without any organic lesions. Although relating imaging findings were defined, there are not much studies if those findings are reversible or not. In this study we aimed to determine the reversibility of the imaging findings.

Method: Eight patients were included in this study. MRI were performed before and after the therapy. The demographic information, body mass index score, the medication period and the MRI findings were recorded. All the MRI scan was interpreted by the same radiologist.

Results: The mean age is 36 years(22-45). The mean BMI is 32,4±2,5. All the patients were women. The mean follow up period is 14 months. 5 months after therapy MRI scan were performed. The sellar configuration in 3 patients were normal before therapy. 1 patient got better and 1 worsened after therapy. The length of the midsagittal pituitary gland is increased in 2 patients while decreased in the other 6 patients. The thickness of the ON is decreased on the left eye in all the patients but only decreased in 5 patients on the right eye. There was no difference on the globus configuration. The tortiosity on the right eye evolved in 2 patients after the therapy while 1 patient worsened.

Conclusion: There are a few studies in the literature stating the differences at the imaging findings before and after the therapy. So our study will provide benefit the literature. We need more further prospective studies to confirm that.

OP 23 Validity And Reliability Of The Turkish Version Of The Mig-Scog Scale In Patients With Migraine

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Background: Migraine is a common disease affecting millions of people worldwide. The impairment of cognitive function associated with migraine attacks leads to a reduction in patients' performance at the workplace, in school, and during other activities. In patients with migraine, the use of the Mig-SCog scale as a reliable and valid instrument to assess the severity of cognitive symptoms occurring during migraine attacks can be recommended. This study assesses the validity and reliability of the Turkish version of the Mig-SCog scale used to determine and monitor the cognitive functions of migraine patients during attacks.

Method: After completion of the translation process, for this validity and reliability study the Mig-SCog was administered to a total of 154 migraine patients (91 without aura, 32 with aura, and 31 chronic migraine patients) presenting to the Neurology Clinic of İstanbul Medipol University. Internal consistency of the factors and the instrument as a whole were evaluated using Cronbach's alpha coefficient, and an alpha value above 0.60 was considered acceptable.

Results: As in the original, the result of factor analysis found a good fit for a 4-factor structure of the Turkish version (KMO=0.82 and Chi-square p=0.409), and the factor structure was similar to the original. The factors of the instrument were evaluated as consistent (Cronbach's alpha >0.60), and an overall Cronbach's alpha of 0.8485 was calculated.

Conclusion: The Mig-SCog showed sufficient validity and reliability to be used in Turkish society. This scale is a patient-centered, illness-related, self-administered instrument that does not require any education beyond literacy. We are confident that more physicians will begin to

to use this scale as a simple, fast, and practical tool, first to establish cognitive effects in patients with migraine during an attack, and then to monitor their response to migraine-specific treatment.

OP 24 Cognitive Impairment Assessment in Migraine Patients

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Background: Migraine is a common headache in Turkey with a prevalence of 24.6% in women and 8.5% in men (1). A considerable part of migraineurs complain of cognitive disorders such as attention deficit and memory problems. The aim of this study is to analyze the presence and level of cognitive symptoms and to measure focused attention and the ability suppressing the habitual behavior pattern in patients with chronic migraine and drug overdose headache and episodic migraine in attack free periods.

Methods: Forty-two migraine patients without aura (MwoA) and 30 healthy controls were included in this study. Detailed headache characteristics, frequency and severity of headache and prophylactic medical history and related comorbidities were determined. All patients were subjected to extended neuropsychological evaluation, MoCA (Montreal cognitive assessment) and Stroop test were performed. Beck depression scale was performed to exclude accompanying depression.

Results: The mean age of patients (36 women, 5 men) and control groups was similar. The reaction time was significantly longer in Stroop test compared to the control group in migraineurs. Chronic migraine patients (n=18) had a worse performance in the MoCA Test, compared to the healthy subjects. The presence of drug overuse headache did not show a significant difference between groups.

Conclusion: Migraine patients have cognitive deficits and executive dysfunctions in multiple tasks. Migraine chronicity seems to be a worsening factor for cognitive dysfunction which is frequently related to disability.

OP 25 Copy Number Variation and Expression of Chrna7 Gene in Migraine

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Background: Migraine is a common and possible hereditary disease. Copy number variation (CNV) is a phenomenon in which parts of the genome are repeated and the number of repeats in the genome varies between individuals in the human population.

Aim: The CHRNA7 gene has a major role in the neuropsychiatric phenotypes observed in patients. The 15q13.3 gain/loss variation in this gene may be associated with migraine. Therefore, the contribution of gene expression and CNV to migraine clinic and its potential to be epigenetic biomarkers were investigated.

Method: We evaluated changes in CHRNA7 gene expression levels and CNV in migraine patients by q-PCR. Copy numbers were graded as normal copy (2), gain (2>) and loss (2<). Results were analyzed using the 2-CT calculation method.

Results: CHRNA7 gene is significantly downregulated in patients with migraine ($p<0.05$). No significant difference was observed between gain, normal and loss copy numbers and expression values among individuals with migraine ($p>0.05$). However, in the analysis of copy number variation in the CHRNA7 gene, gain and loss in the patient group was statistically significant according to healthy control group ($p<0.05$).

Conclusion: Down-regulation of the CHRNA7 gene may contribute to the formation of migraine by inactivation of α_7nAChR . The association of CNV gains and losses with migraine will lead to a better understanding of the molecular mechanisms and pathogenesis in order to better define the disease and to be used as a treatment target

ELECTRONIC POSTER PRESENTATIONS

EP 1 A Case Of Episodic Migraine Without Aura Developed After Sexual Attack to a 16 Years Old Adolescent

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Background: Adolescence and early adulthood are significant risk periods for sexual assault. It is known that more than half of the rape victims experienced their first rape before the age of eighteen. Depression, post-traumatic stress, sexually transmitted infections, substance abuse and physical health threatening conditions are common in many people who experience this type of violence, as well as tension headache and headache types such as migraine. On the other hand, although it is known that sexual assault is associated with a wide range of physical and psychiatric symptoms, very little researches have addressed its relationship with headache.

Case: In this case report, a seventeen-year-old adolescent girl exposed to sexual attack of her boyfriend and experienced the first migraine attack a few days after the abuse, was shared after she appealed our clinic. As a result of the neurological examination, the patient was diagnosed with episodic migraine without aura, and was consulted with the pediatric and adolescent psychiatry clinic after the anamnesis received after the patient reported that she had been exposed to sexual assault three months ago and the symptoms of post-traumatic stress were observed. After the psychiatric assessment, the patient was diagnosed with major depressive disorder and post-traumatic stress disorder and she was treated in coordination with our clinic. In addition to the frequency, duration and severity of pain in our case, whose treatment is still continuing there is a significant decrease in

post-traumatic stress symptoms as well as psychotherapy sessions.

Conclusion: As a result, it will be beneficial to adopt a multidisciplinary approach in the assessment and treatment process, considering that any psychological trauma experienced not only in the form of sexual abuse, but also physically or emotionally, is associated with headaches in children, adolescents and adults. Although it is common, sexual abuse situations especially in adolescence can be overlooked by many physicians in pediatric headaches. However, early assessment and identification of all forms of abuse can prevent long-term compliance problems. Realizing the role of this mechanism in the treatment of ill-treated migraine patients will pave the way for another treatment process.

EP 2 Atypical Tumefactive Virchow Robin Spaces: Review Accompanied By A Case

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Background: Virchow-Robin spaces (VRS) are pial-lined interstitial fluid-filled spaces in the brain that surround perforating vessels. These spaces, which are usually asymptomatic, are increasingly being detected. In this study, we aimed to evaluate the clinical relationship between atypical tumefactive VRSs detected in a patient with headache and presyncope clinics and what should be considered in the differential diagnosis in the light of the literature.

Case: A 20-year-old female patient presented with headache and presyncope. Headache; it was a compressive pain localized to bilateral temples and left vertex. For 2 years, 20 days of a month, there were recurrent pain attacks 1-2 times a day and lasted for several hours. There were no accompanying symptoms. There was no feature in her resume and family history. The neurological examination was normal. Electrocardiography (ECG) and electroencephalography (EEG) were within normal limits. In the right frontal parasagittal area, Magnetic Resonance (MR) imaging revealed atypical tumefactive VRSs which are multilocular, same attenuation or intensity as cerebrospinal fluid (CSF), no peripheral parenchymal hyperintensities and no enhancement. The patient was diagnosed with chronic tension-type headache according to International Classification Headache Disorders- 3 (ICHD-3) criteria. VRS are mostly microscopic, although more enlarged spaces may be detected on Computerized Tomography (CT) or Magnetic Resonance Imaging (MRI). Most commonly, perivascular spaces are located in the lower half of the basal ganglia. Perivascular spaces which are visible on imaging are typically less than 5 mm in diameter but can reach much larger sizes. A so-called "giant" perivascular space or tumefactive perivascular space. Cortical involvement is a rare form of involvement. In our patient, in the right frontal lobe, was multilocular and the largest VRS was 8.56 mm. Differential diagnosis must be considered choroid fissure cyst, lacunar infarcts and striatocapsular infarcts, chronic small vessel ischemic disease, neurocysticercosis, Central Nervous System (CNS) cryptococcosis (if multiple). Because of our patient is a young,

absence of vascular risk factors and no other changes of chronic small vessel ischemia, no a rim of gliosis on FLAIR (fluid attenuated inversion recovery), negative mass effect, no enhancement, no calcification and showing the same attenuation or intensity as CSF, were considered VRS.

Although VRS is usually asymptomatic; rarely, they can cause mass effect and can result in obstructive hydrocephalus. There was no clinical correlation between headache and presyncope in our patient and VRS.

Conclusion: As a result; VRS is a common neuroimaging finding that requires a differential diagnosis. Differential diagnosis is difficult in cases where it is atypical; clinical features of the patient and additional imaging methods may be helpful in the diagnosis.

EP 3 Approach To A Large Bilateral Subdural Hematoma As A Complication Of Spontaneous Intracranial Hypotension, A Case Report

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Background: Spontaneous intracranial hypotension headache (SIH) is a rare syndrome due to cerebrospinal fluid (CSF) leakage mostly in the cervical or cervicothoracic region that accompanies decreased intracranial pressure and volume. The causal relationship is often uncertain. This syndrome produces a range of symptoms. The common clinical presentation of SIH is a postural headache, but this characteristic usually fades with time. SIH may lead to subdural hematomas (SDHs) that could be quite large with neurological deficits, so prompt diagnosis and proper treatment of SIH are essential. Initial treatment involves conservative therapies, but the mainstay of treatment for patients who fail conservative management is the epidural blood patch (EBP). In patients with SIH, any change in the pattern of headache, were identified as red flag signs of the SDH development but its management remain controversial.

Case: Our patient is a 27 y/o lady presented with a history of positional headache. She described the nature of the headaches as generalized pressure which worsened with upright position (relief by lying). The patient denied any recent history of falls or head trauma. Physical examination revealed no sensory or motor deficits. Cranial nerves were intact. Brain MRI revealed diffuse pachymeningeal enhancement. Her CSF analysis was normal and the opening pressure of lumbar puncture was 5 cmH₂O. These MRI findings and history and CSF pressured were consistent with spontaneous intracranial hypotension headache (fulfilled ICHD-3). Because of the failure of conservative medical treatments (after 1 month) , a blind lumbar EBP was performed. The patient reported improvement in her headache. One week later, she returned with recurrence of her headache and again EBP was performed but her headache didn't improve. The pattern of headache changed (persisted despite lying position) and she complained of severe headache, neck pain with nausea and vomiting. A brain CT scan and MRI were obtained and showed the development of bilateral SDHs (left>right) with mild rightward midline shift. She was treated by

conservative therapy (complete bed rest and steroid therapy). The neurosurgery team was consulted to get their opinion regarding her SDH treatment. They also agreed with conservative treatment because of the possibility of severe complications with hematoma evacuation. An MR myelogram was performed with negative result for CSF leak .The headache is relieved by these therapies during admission course and subdural hematomas were followed up to 3 months when they resolved completely.

Conclusion: The management of SDH in SIH remains controversial. Conservative therapies, including bed rest and hydration, may be the effective first-line treatment in patients with SIH complicated by SDH. One conclusion we have reached in this patient is that steroids may be effective in improving symptoms. evacuation of SDH in SIH can be dangerous, causing stroke from downward displacement of the brain, without prior control of the CSF leak. Due to the possibility of such a worse complication with SIH, early treatment of CSF leak is highly suggested. We will present the full history and imaging and discussion in our poster.

EP 4 Predicting Indomethacin Test Outcome

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Background: Identify predictors of outcome to indomethacin exposure.

Method: We audited the clinical records for all patients with paroxysmal hemicrania (PH) or hemicrania continua (HC) seen at King's College Hospital in London from 2013 to 2018, who underwent an indomethacin test. Data was coded and entered in Microsoft Excel. Comparisons between the positive and negative test groups were conducted using Excel analytics.

Results: Of 180 patients with suspected diagnosis of PH or HC, 86 completed the Indo-test, out of which 50 patients were positive and 36 were negative. Of the negative group, 31 out of 36 were diagnosed as migraine later. After comparing the positive and negative groups, we found that presence of agitation predicted positive Indo-test, while presence of yawning predicted a negative outcome.

Conclusion: Clinical phenotype can augment the Indo-test in diagnosing patients with PH and HC.

EP 5 Mediators Involved In Pathophysiology Of Gastrointestinal Problems Associated With Migraine: A Review

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Background: Migraine is the most frequent primary headache and one of the most prevalent neurologic disorders. The years of life lived with disability (YLDs) for migraine has been estimated about 45.1 million. The migraine tendency is a complex of inheritance, endogenous and exogenous precipitators. The pathophysiology of migraine isn't understood enough, but in recent decades studies concerning this topic have been rapidly increased. Comorbidities linked with migraine influence migraine attacks severity and frequency. Several studies revealed the relationship between migraine and gastrointestinal (GI) disorders such as Helicobacter Pylori infection, irritable bowel syndrome (IBS), celiac disease (CD), biliary tract disorders, obesity, and gastrointestinal dysbiosis. The purpose of this study is reviewing the pathophysiology involving in GI problems and migraine for better understanding future areas of treatment of this comorbidity.

Methods: We searched all publications covering central nervous system (CNS) and GI relationship with focusing on coincidence of migraine and GI disorders pathogenesis in PubMed and Google Scholar search engines.

Results: Gut has bidirectional relationship with CNS. Neuropeptides and inflammatory mediators such as calcitonin gene related peptides (CGRP), substance p, neuropeptide Y (NPY), vasoactive intestinal peptide, and also hormones e. g. Cholecystokinin (CCK), somatostatin and corticotropin-releasing hormones play principle roles in connecting nodes. Serotonergic, dopaminergic, GABAergic pathways, and CGRP signaling are involved in gut-brain axis interconnections. Normal gut flora plays an important role in keeping a balance of this axis.

Conclusion: CCK and CGRP are responsible for major GI symptoms and enteric autonomic dysregulation during the migraine attack. CGRP and CCK inhibit gastric emptying, acid secretion, gall bladder contraction and pancreatic secretion which are issues in migraine gastroparesis. Although we discuss the probable pathophysiology, the precise mechanisms of this comorbidity are not clear yet. Therapeutic agents modulating 5-HT receptors are novel drugs in controlling patients with both IBS

and migraine. CGRP receptor antagonists are other new aspects in treatment of migraine and GI problems. Further studies are needed to clarifying mediators connecting these two disorders.

EP 6 Epidemiological, Diagnostic, Therapeutic and Progressive Aspects of Headache at the Outpatient Neurology Clinic at the Saint-Louis Regional Hospital Center

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Background: Headaches are among the most common nervous system conditions in the world. They have an impact on the life, resulting in disabilities, a deterioration in the quality of life and in financial costs. We aimed to study the epidemiological, diagnostic, therapeutic and progressive aspects of headache in a series of 42 patients.

Method: This was a descriptive transverse retrospective study for analytical purposes concerning headache cases received at the outpatient neurology clinic at the Saint-Louis Regional Hospital Center from January 01,2017 to June 30,2019. Were included in studying all cases of headache received at the neurology consultation with complete data.

Results: 42 patients were enrolled. The mean age was 37.6 years±15.6 years. The sex ratio was 0,23. The family character of the headache was found in 40.5% of the patients. Primary headaches (83.3%) consisted of isolated migraines (64.3%) ,isolated tension headaches (7.1%) , migraine and tension headache (11.9%).Secondary headache (16.7%) consisted of chronic post-TCE headache (7.1%) ,psychogenic headache (4.8%) , vascular headache (2.4%) insomnia headache (2.4%).The average of consultation period was 1.4 years. Self-medication was used by 61.9%. Traditional treatment was used by 54.8%. The basic therapy for migraines and tension headaches was amitriptylyne. The evolution was favorable under treatment with a decrease in seizures in 76.8% of the cases, cessation of the seizures in 4.8% .

Conclusion: Headache is a frequent reason for consultations. However, they are undervalued in Africa with a self-medication which is very present.

EP 7 Headache Features of Cerebellar Stroke Patients

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Background: The prevalence of headache in stroke is 8-34%. Headaches are more frequent in vertebrobasilar strokes and cerebellar infarctions are the most common ones. Our objective is to evaluate the features of cerebellar infarctions with headache (CIWH).

Results: Among 200 patients, 22 patients (11%) who had CIWH were included in this study (5 females, 17 males). The mean age was 65.4 years. In terms of accompanying examination findings, gait ataxia, dysarthria are most common. Single lesions were observed in 54.6% of patients and multiple ones were 45.4%. Cortical/ juxtacortical lesion rate was 63.6%, deep white matter was 0% and both of them were 36.3%. Large ischemias above 1.5 cm was 59%, others were 41%. In 23 infarct lesions, hemispheric involvement (9 right, 14 left) detected. Vermian area affected in 26 infarctions (9 right, 17 left), peduncular involvement seen in 4 infarctions (1 right, 3 left). Mean ASPECT score was 8.68. 5% patients' ischemia were in PICA territory, 22.4% were in SCA, 1% were in AICA and 6% were in both three areas. Patients had predominantly atherosclerotic etiology (50%). Nineteen patients had low NIHSS scores. Eighteen patients had high mRS (mRS 4-5) but all have been shown a great overcome at discharge and 6th month (mRS 0-2).

Conclusion: CIWH have generally good prognosis unless there is a consciousness disorder. Headache seen predominantly in left hemispheric, cortical/juxtacortical involvement and PICA territory lesions with even absence of malignant edema. This brings to mind that other than trigeminovascular activation, central pain matrix involvement may have the explanation.

EP 8 Prevalence and Triggers of Migraine in Primary Through High School Teachers: A Questionnaire Study

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Background: Migraine is the third most common disease in the world with a prevalence of 16.4% in Turkey. Any stimulus that consistently contributes to the onset of a headache attack on predisposed individuals is described as 'trigger'. A series of factors are considered triggers for migraine including stress, dietary factors, environmental factors, hormonal factors and sleep disorders. We aimed to investigate if the prevalence and triggers could be related to profession and/or weather changes.

Methods: We included 117 teachers from three different centers, primary through high school, located in a city of Western Black Sea region, with cold winters and high altitude in the study. Each individual was interviewed according to a structured questionnaire consisting diagnostic features about migraine and 15 predefined trigger factors. According to the results of this questionnaire, participants were grouped into three categories: teachers with migraine, with possible migraine and without migraine.

Results: Out of 117 teachers, 36 (30.8%) had migraine and 27 (23.1%) had possible migraine. Mean age was 41.49 ± 7.64 years and 19 participants (17.0%) were male. Thirty-five (30.4%) participants had migraine history in their family. The most common trigger for migraine and possible migraine groups combined was stress (90.5%) followed by fatigue (85.7%), hunger (77.8%) and lack of sleep (76.2%). Weather-related changes (snowy, sunny, windy weather, change of altitude, high humidity, decline in temperature) were also reported as triggers in 28.6%, 33.3%, 58.7%, 15.9%, 34.9%, 49.2%, respectively.

Conclusions: Migraine seems to be a very common problem in teachers, nearly doubling the national prevalence rates. Moreover, weather changes gain importance according to residential region as a cited trigger. The sensitivity to trigger factors should be considered by both clinicians and headache sufferers. Migraine treatment should be tailored to these sub-groups, considering specific triggers.

EP 9 Clinical Characteristics of Primary Headaches in Moldavian Adolescents

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Background: Accurate diagnosis of primary headache types is very important for correct prophylaxis and treatment, but this is sometimes complicated in the adolescence due to similar clinical features of migraine (MG) and tension-type headache (TTH). The aim of this study was to evaluate the specific clinical characteristics of MG and TTH in adolescents in the Republic of Moldova.

Method: We studied 3389 adolescents (10–19 y. o.) by means of self-administered questionnaire based on ICHD–2 (2004) and ICDH–3 beta (2013) criteria.

Results: Regardless of the type, the frequency of headache was higher in girls ($p < 0.001$) without difference according to age ($p = 0.395$) and residence ($p = 0.003$) criteria. The duration of headache was higher among girls, in late adolescence and urban adolescents ($p < 0.001$). The pain intensity was significantly higher in MG ($p < 0.001$), in late adolescence and in urban area ($p < 0.001$). The pain pressure character was characteristic for over 60% of adolescents with both types of primary headache (MG – 60.5%, TTH – 68.5%). Bilateral pain was a specific feature for both types of headache, but its prevalence was significantly higher in TTH (30.3% vs. 55.9%, $p < 0.001$). Among the symptoms that may be associated with headache, a common feature for both types of primary headache was phonophobia (MG – 85.4%, TTH – 72.8%, $p < 0.001$).

Conclusion: During adolescence, especially in 10–14 y. o. adolescents, MG and TTH have similar characteristics, causing difficulties in differentiating these two types of primary headaches.

EP 10 Vitamin B12 And Tension Type Headache

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Background: Vitamin B12 plays a role in DNA synthesis, erythrocyte production and myelin sheath synthesis. In its deficiency, diseases such as reversible dementia, depression and tinnitus may occur. Many causes may play a role in its etiology, such as certain medications, Malabsorption, and fast food-style nutrition. In this study, we wanted to share the relationship between VAS and B12 vitamin levels of patients with tension headaches in the light of the literature.

Discussion: This study was performed in patients over 18 years of age who applied to the Neurology outpatient clinic between 01.01.2018-31.12.2019 with tension headache. The patients were divided into 3 groups according to vitamin B12 levels. Group 1; B12: 150pg / ml and below too low, Group 2; B12: Those between 150-220 pg / ml were considered as Group 3; B12 220 pg / ml and above were considered high. These groups were compared among themselves.

Results: 1019 patients diagnosed with tension headache were included in the study. In Group I; 644 in Group II; In 301, Group III; 74 patients were detected. 37.2% of the patients were male and 62.8% were female. In the evaluation of patients between vitamin B12 level and VAS score, those who were below 150pg / ml did not have statistical significance between those whose vitamin B12 was between 151-220 pg / ml and above 220 pg / ml. $p > 0.110$. We could not find a relationship between type headache. In studies conducted in different population groups, the incidence of vitamin B12 deficiency has been reported at rates ranging from 0-33%. In a study, the population in terms of serum B12 vitamin level among young and old, male and female individuals aged between 20 and 93, who were healthy, outpatient. no differences were reported.

Conclusion: We concluded that early detection and treatment of vitamin B12 deficiency is important in terms of screening all people who are prone to deficiency at the first opportunity to improve almost all of the pathologies that may develop in patients or to prevent the progression of existing disorders. Severe hypokalemia and related sudden death may be seen at the beginning of vitamin B12 treatment. In this respect,

the patient is followed and special attention should be paid to starting treatment at low doses in severe deficiencies. It is also recommended to consume vitamin B12 only because it is found mostly in animal foods in the liver.

EP 11 Bidirectional Effects of Headache and Sleep Disorders

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Background: Headache and sleep have a complex relationship. Headache promotes sleep disturbances and poor sleep can precede and trigger headache. These bidirectional association, can be related to the fact that sleep and headache have common brain structure. Several studies demonstrated that sleep problems increase in line with the frequency of headache and the majority (64-84%) of individual with chronic migraine suffer from insomnia. In addition, poor sleep quality and loss of sleep have been described as an important factor for progression from episodic to chronic headache. Furthermore, chronic pain interferes with sleep architecture by increasing number of awakenings and decreasing slow wave stage (N3), which leading to poor sleep and low quality of life and depression. Consequently the pain alleviation may not be the most effective strategy to improve sleep quality in patients with headache, In spite of the multidisciplinary approaches to alleviate different possible problems such as psychiatric co-morbidities e. g. depression, sleep associated disorders e. g. sleep apnea, systemic co-morbidities e. g. cardiac or pulmonary diseases might be the most effective way of treatment. As a result, this multimodal therapeutic approach could be the most effective treatment in these patients.

EP 12 Effect of N-acetyl Cysteine in Oxaliplatin Induced Neuropathic Pain in Rat Model

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Background: Oxaliplatin is a first line chemotherapeutic agent in colorectal cancers. The oxaliplatin related neuropathic pain and cold sensitivity is an important dose limiting side effect for patients receiving oxaliplatin chemotherapy. We produced oxaliplatin induced neuropathy in rats and investigated the preventive and treatment effect of N-acetyl cysteine.

Method: Rats were divided in 3 groups as control (C), oxaliplatin (OX) and N-acetyl cysteine (NAC); each group contained 6 rats. All rats were injected 6 mg/kg oxaliplatin (IP) or vehicle on the first day of experiment. In NAC group, NAC 50 mg/kg/day(IP) was injected everyday starting at the first day. Rats were evaluated with von Frey test for mechanical allodynia was performed before the experiment and at the 3rd,7th, 14th and 21th days.

Results: In OX and NAC groups forepaw and hind paw threshold was significantly lower on the 3rd day of oxaliplatin injection compared to control group. This indicated the presence of oxaliplatin-induced neuropathy. In OX group allodynia continued until the last day of experiment. In NAC group, VF values of forepaw on the 7th day and VF values of hind paw on the 14th and 21st day were significantly higher compared to OX group.

Conclusion: The prevention of oxaliplatin-induced neuropathy was not achieved by NAC. Still, N-acetyl cysteine seems to be helpful to decrease neuropathic pain in rats.

EP 13 Reversible Abducens Nerve Palsy in Cerebral Venous Sinus Thrombosis

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Background: The isolated paralysis of nervous (N) abducens can be seen in pons lesions due to different etiologies, or it may occur in cases where the intracranial pressure is increased. In other words, although the process that causes intracranial pressure increase syndrome does not directly infect N. abducens, the function of the nerve is disrupted due to high pressure. In a patient with intracranial pressure increase syndrome, n.abducens palsy does not have a localization value. Cerebral venous thrombosis (CVST) is also an infrequent cause of stroke that goes with increased intracranial pressure. Anticoagulants are used to treat. We shared the case to point out that CVST is one of the conditions to be investigated in the etiology of unilateral reversible isolated abducens nerve palsy.

Case: We describe here a 24 year old female who gave birth 15 days ago, presented with headache for ten days and diplopia for 3 days. On examination she had bilateral papilloedema and left lateral rectus palsy. No other neurological deficit was present. MRI brain and MR venography widespread thrombus in the superior sagittal sinus and right transverse sinus, partial thrombus in the left transverse sinus are reported. Headache decreased markedly after heparinization and there was an improvement in abducens palsy on the 10th day of heparinization.

Conclusion: In etiology of abducens paralysis CVST should be reviewed like all KIBAS causes because it can be completely corrected with appropriate treatment.

EP 14 Treatment Management in Migraine with Aura in a Cardiac Right to Left Shunt Patient

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Background: Migraine is one of the most common primary headache in women. It is thought to be associated with migraine with aura and stroke. The risk appears to be much higher in women of young age, smokers and those who use oral contraceptives (OCs). Migraine infarct and migraine related stroke can be seen in relation with migraine and patent foramen ovale (PFO). In this article, treatment management is presented in a case of migraine with aura who had PFO.

Case: A 29-year-old female patient had transient partial loss of vision in her left eye for 5 years. This loss of vision was slow in the field of vision and took about 15-20 minutes. Then a unilateral throbbing headache that lasts about 36 hours occur. He had an average of three attacks per month. The patient, whose neurological examination was normal, had a history of smoking (10 cigarettes a day). Cranial MRI showed gliotic lesions in both hemispheres. PFO was detected in the patient who underwent echocardiography (ECO) and transesophageal echocardiography (TEE). The patient was diagnosed with multiple embolic foci at the embolic shower, and anticoagulant therapy was started after cardiology consultation. The frequency of attacks was once a month in the patient who received prophylactic treatment. One year later, after detecting a two-fold increase in the lesion load at control MRI, PFO was closed with PFO percutaneous angiography. Clopidogrel was started. Prophylactic treatment was discontinued. During one year of follow-up, there were three migraine attacks without aura. Control embolic shower test was negative.

Conclusion: In patients with PFO having migraine with aura, PFO closure may be effective in selected patients having risk factors if their attacks continue despite treatment and the brain lesion load increases.

EP 15 Clinical Evaluation of Cerebral Venous Sinus Thrombosis

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Background: Cerebral venous sinus thrombosis (CVST) is an uncommon form of stroke usually affecting young individuals with extremely diverse clinical features, predisposing factors and imaging findings. Sometimes there are difficulties in diagnosis due to the variability of admission symptoms and clinical findings. The aim of this study is to evaluate socio-demographic, clinical, etiological features and prognosis of CVST. Method: The etiological, demographic, clinical features, treatment procedures and prognosis were reviewed in 56 patients (41 female and 15 male) aging 15 to 82 who accepted to Şişli Hamidiye Etfal Training and Research Hospital Neurology Clinic between 1996 and 2012 with a diagnosis of CVST.

Results: The mean age of patients were 34 ± 14 years. Headache was the most common presenting symptom (85.7%). Isolated intracranial hypertension was detected in 17 (30.4%) and focal neurological deficits in 21 (37.5%) patients. Neurologic examination was normal in 18 (32.1%) patients. Etiologic factors were oral contraceptive (n=7), pregnancy (n=5), postpartum period (n=9), hereditary thrombophilia (n=16), Behçet's syndrome (n=4), ulcerative colitis (n=1), systemic lupus erythematosus (n=1), malignancy (n=2), hormone replacement therapy (n=1), anemia (n=6). In 13 patients we did not find any etiological factor. In Patients with focal neurological deficits, sequelae and mortality rates were observed more frequently than isolated intracranial hypertension and normal ones, and there was a more distinct difference between those with focal neurological deficits and normals (Chi-square test, $p=0.029$, $p=0.001$ respectively).

Conclusion: For the diagnosis of CVST clinical suspicion has major importance. It can present with variable signs and symptoms and it may be difficult to diagnose. Because early treatment reduces risks of disability and mortality it is important to keep in mind the clinical features for the correct diagnosis.

EP 16 A fast effective treatment in cerebral venous sinus thrombosis: endovascular intervention

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Background: Cerebral venous and sinus thrombosis (CVST) is a rather rare disease which accounts for <1% of all strokes and usually affects young individuals. Anticoagulants are the first preferred group of drugs in the treatment. However neurological condition may worsen during anticoagulation especially in cases with extensive thrombosis. Endovascular treatment options may be considered in these selected cases with clinical worsening or no improvement despite therapeutic anticoagulation.

Methods: We present three CVST cases with NIHSS 16,17 and 19 those showed rapid recovery after mechanical thrombus aspiration, respectively to remind the role of endovascular intervention in the treatment of CVST. Demographic data, symptoms and duration, NIHSS scoring, brain imaging and laboratory findings were evaluated retrospectively between April 2018 - February 2020 in patients treated with CVST diagnosis and endovascular intervention at our clinic.

Results: The mean age of 3 patients was 23,3, the first symptom of the disease was headache, and the duration was on average 7.1 days. admission NIHSS mean was 17, 3 mean hospitalization time was 13 days, all patients who were administered anticoagulant treatments after mechanical thrombus aspiration were discharged without sequelae.

Conclusion: Endovascular treatment option is a chance that can be offered for rapid recovery in selected patients.

EP 17 Importance of Neuropathic Pain in Guillain-Barré Syndrome

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Background: Guillain-Barré syndrome (GBS) is an immune-mediated inflammatory peripheral neuropathy. While weakness is thought to affect the quality of daily life but sensory symptoms, especially "pain" draw attention and cause a search for treatment. We aimed to examine the characteristics of GBS patients with clinical, electroneuromyographic (ENMG) features and frequency of neuropathic pain.

Method: Thirty-one patients who were hospitalized for GBS within 1 year were included. Demographic, clinical, ENMG features, pain onset time-location, Douleur Neuropathique en 4 Questions (DN4), Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) scores were recorded.

Results: The mean age was 47±17.35(19-77). 48.4%(15) were female, 51.6%(16) were male (p=0.857). First complaints were; sensory complaints in 29%(9), weakness in 58.1%(18), difficulty in walking in 12.9%(4). ENMGs of patients had demyelinating in 71%(22), axonal polyneuropathy in 19.4%(6). In the first admission, only 25.8%(8) had pain complaints, whereas DN4 scores during hospitalization were above 4 points in all patients. Pain area; 16.1%(5) were radicular lumbar-back pain, 67.7%(21) were muscle pain in the legs-calves, the remaining 16.1%(5) were pain in both regions. LANSS scores were 16.8±2.28 at 1st month and 17±2.30 at 3rd months (p=0.550). In 67.7% of patients, neuropathic pain was accompanied by nociceptive pain.

Conclusion: Pain in GBS can be acute, subacute or chronic. Low-back pain is common; muscle, radicular, meningism/headache, visceral pain, arthralgia are also seen. Pain mechanisms in GBS have not been fully elucidated. In long-term follow-up in GBS; as the pain worsens the quality of life, it's important to examine and treat the pain in detail.

EP 18 A case of Medication Overuse Headache

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Background: Medication-overuse headache(MOH) is a secondary disorder caused by excessive use of acute medications.It was previously termed as analgesic rebound headaches, drug-induced headache, and medication misuse headaches. Medication-overuse headache is a growing problem worldwide. We here present a case of MOH to underline and discuss its importance.

Case: 32 years of female patient with no chronic disease history, had a history of one sided thobbing headache(especially at the right-side) for 6-7 years. She had photophobia-phonophobia-nausia during headaches. Before the last 6 months, the frequency of headaches were less than twice a week. But at the last 6 months, her headaches were 5-7 days per week, and the intensity of pain were VAS(visual analog scale):7-10. She had started to use analgesic drugs everyday, and 3-5 triptans per week. She had also a history of amitiripylone, duloxetine, sertraline, topiramate, essitaloptam usage for prophylaxis. Her brain MRI, MR angiography and ophthalmic exam, blood tests were all normal.

The patient was diagnosed as MOH due to "The International Classification of Headache Disorders 3rd edition". The criterias are: headache occurring on ≥ 15 days/month in a patient with a pre-existing headache disorder, regular overuse for >3 months of one or more drugs that can be taken for acute and/or symptomatic treatment of headache, not better accounted for by another ICHD-3 diagnosis.

First of all, we have explained a detailed information of the headache and treatment strategy to the patient. Then we have stopped the triptan and analgesic usage(weaning) immediately. We offered the patient to increase her water intake, and to use parasetamol, naproxen during headaches. For prophylactic treatment we have performed bilaterally greater occipital nerve blockade and bilaterally intranasal sphenopalatine ganglion blockade once per week at the first month, and once per 15 days st the second month. And also propranolol(2x20mg at the first week, and 2x40mg after), venlafaxine(1x37.5mg at the first week, and 75mg after) medications were used. 15, 30 and 60 days of treatment were recorded. A significant decrease was observed in terms of both severity and intensity of headaches.

Conclusion: Medication overuse headache is the most common form of secondary chronic daily headache seen in headache practice, and probably accounts for about half of cases of chronic daily headache. After diagnosis, the first step must be educating the patient and weaning. Then a close follow-up, and prophylaxis can increase the quality of life of our MOH patients.

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EP 19 The Validity and Reliability of an Arabic Version of the Migraine Screen Questionnaire (MS-Q) in the Primary Care Setting for Identifying Hidden Migraine

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Background: Migraine in Saudi Arabia is diagnosed late in most patients. Absences of early diagnostic criteria by the primary health care providers contributed significantly to the late identification of Migraine. We found that there is no validation of an Arabic version of the Migraine Screen Questionnaire (MS-Q).

Objective: To produce a conceptually equivalent, reliable and validated Arabic version of the Migraine Screen Questionnaire (MS-Q) to be used among Arabic speaking adults from both genders in King Fahad medical city and its following primary health care centers in Riyadh, Saudi Arabia from February 2019 to February 2020.

Methods: A cross sectional study conducted randomly on 308 subjects either gender over the age of 18 years attending the primary care clinic in King Fahad Medical city and its following primary care centers during the period from February 2019 to February 2020. Migraine Screen questionnaire was translated from the English (source language) to Arabic (target language) by two bilingual translators separately; the two versions were combined and back translated into English by other English translators who are blinded to the source documents. Five bilingual experts examined the Arabic version for content and agreed upon it. Pilot study was conducted to examine the tool clarity; expert physicians diagnosed migraine based on the International Headache Society (IHS) criteria for validation.

Results: Out of 400 screened participants, the eligible participants were 308 (77%) subjects, 176 participants (57.1%) were female and 132 (42.9%) participants were male with a mean age 29.9 ± 8.9 years. Cronbach's κ coefficient ranged from 0.81 to 0.83 (95% CI) which considered accepted. Pearson's correlation coefficient showed a high infraclass correlation, value ranged from 0.77 to 0.82 (95% CI). The receiver- operating characteristic (ROC) curve between the MS-Q scores and the International Classification of Headache Disorders (ICHD-3) scores showed an excellent AUC 0.97 CI 95% (0.94-0.99)

with a sensitivity 0.95 and 0.99 specificity.

Conclusion: Our results support the use of this Arabic version of the Migraine Screen Questionnaire as a valid tool for headache assessment among Arabic-speaking patients.



terminals of the vagus nerve. In this regard, it has been suggested that probiotic supplementation may be helpful in migraine prophylaxis. Moreover, it is also proposed that migraine may be improved by dietary approaches with beneficial effects on gut microbiota and gut-brain axis including appropriate consumption of fiber per day, adhering to a low glycemic index diet, supplementation with vitamin D, omega 3 and probiotics as well as weight loss dietary plans for overweight and obese patients.

EP 22 Preoperative and Postoperative Headache in Patients with Primary Brain Tumors

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Background: Headache is a common symptom in patients with primary brain tumors, especially in occipital location. The pathophysiology behind brain tumor related headache is poorly understood, and the symptomatic effect of surgical resection is not much studied.

Objective: We sought to examine prevalence of headache in patients with histopathologically verified primary brain tumors scheduled for surgery and assess change in headache 3 months after surgical resection. Possible tumor-related and patient-related predictors for preoperative headache and early postoperative symptom relief were also explored.

Methods: We conducted 69 patients, analysis of brain tumour cases from Neurosurgery department data. Only patients with a confirmed diagnosis of brain tumour (no details on specific pathology were available) were selected for this analysis. We examined specific outcomes to try and understand the clinical pathway from symptom onset to specialist consultation.

Result: In this retrospective population based cohort study of 37 patients we found that headache is a frequent symptom in patients with intracranial neoplasms. 51% reported some degree of preoperative headache, and the prevalence dropped to 30% 3 months postoperatively. No independent risk factors for worsening or new headache after surgery were identified.

Conclusion: Headache is a common symptom in patients with intracranial tumors, especially in young female patients. Many patients experience improvement after surgery, and younger age, female gender, occipital tumor location.

EP 20 Development of Quality of Life Assessment Questionnaire Associated with Osmophobia in Migraine Patients

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Background: Migraine is a syndrome that affects the quality of life and triggered by internal or external factors. Although there are some tools in order to measure the quality of life in migraine, there is not any scale that assess the effect of osmophobia which is almost specific to migraine on quality of life.

Objective: The aim of the present study was to develop a practicable and reliable scale that assesses the effect of osmophobia on quality of life in migraine patients.

Methods: This cross-sectional study was carried out with 163 patients with migraine and 110 healthy individuals for control group. The scale items were constructed based on after literature review, expert opinions, and preliminary trial stage. A semi-structured interview was performed in order to evaluate presence of osmophobia.

Results: Migraine osmophobia-related quality of life assessment (MORA) consists of 6 items including personal care, eating or cooking, house cleaning, close relationship, social life and traveling. The Cronbach's α coefficient was 0.86; and the Guttman split-half coefficient was 0.83. Receiver operating characteristic analysis showed an area under the curve of 0.943 (95% confidence interval [CI]=0.902-0.984), a cut off score of > 9.5, a sensitivity of 91.6 %, a specificity of 85.7%. Mean scores of the MORA differed between migraine patients (with and without osmophobia) and healthy controls (<0.001).

Conclusion: MORA is a valid and reliable self-report questionnaire that assessment the effect of osmophobia on quality of life in migraine patients. This questionnaire appears to be practicable diagnostic instrument in the clinical practice and researches.

EP 21 Migraine and Gut: Bidirectional Effect

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About 11-16% of the adult population worldwide suffer from migraine. The disease is three times more prevalent among females and imposes high burden at the individual and society level. According to Global Burden of Disease (GBD) study 2018, migraine has been recognized as the first leading cause of disability in those aged less than 50 years. The exact pathogenesis of migraine is still undefined but implies numerous factors, including the gut-brain axis, which may impact on the disease.

To date, several researches have shown that migraine is associated with some gastrointestinal (GI) disorders such as Helicobacter Pylori (HP) infection, irritable bowel syndrome (IBS), and celiac disease (CD). According to the current knowledge, migraine headache in patients with HP might be improved following the bacteria eradication. Migraineurs with long headache history and high headache frequency have a higher chance of being diagnosed with IBS. IBS and migraine share some similarities and can alter gut microflora composition and thereby may affect the gut-brain axis and inflammatory status. Migraine has been also associated with CD and the condition should be searched particularly in patients with migraine with occipital and parietooccipital calcification at brain neuroimaging. In those patients, gluten-free diet also may be effective in decrease of migraine frequencies. The evidence regarding the relationship between migraine and GI disorders certainly emphasized on the effects of gut-brain axis and dysbiosis in migraine pathophysiology. The mechanism explaining how the gut and the brain may interact in patients with migraine are not entirely clear. Studies suggest that the serotonin pathway and neuropeptides such as glutamate, neuropeptide-Y and cholecystokinin may play a role. The terminology "gut-brain axis"-points out to a bidirectional relationship between the GI system and the central nervous system (CNS).

It is noteworthy that also the composition of the gut microbiota plays a major role in gut-brain axis. This happens via two mechanisms: indirect signaling, including microbiota-derived neurotransmitters, inflammatory molecules, and hormones; and direct connection with stimulating end