



**GLOBAL  
MIGRAINE & PAIN SUMMIT**  
**5<sup>th</sup> MENA Meeting &**  
**3<sup>rd</sup> Turkish African Meeting of  
Headache and Pain Management**

October 27-30, 2021  
Akra Otel, Antalya

Early Bird Registration Ends : July 1, 2021  
Abstract Submission Ends : September 30, 2021

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**ABSTRACT BOOK**

# Neurological Sciences and Neurophysiology

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### Addresses

#### Editorial Office

Dr. Gülten Akdal  
Department of Neurology, Dokuz Eylül University,  
Faculty of Medicine, Izmir, Turkey  
Tel: +90 232 - 4124059 - 4059  
Email: [gulden.akdal@deu.edu.tr](mailto:gulden.akdal@deu.edu.tr)  
Website: <http://www.nsnjournal.org/>

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# GLOBAL MIGRAINE & PAIN SUMMIT

## 5<sup>th</sup> MENA Meeting & 3<sup>rd</sup> Turkish African Meeting of Headache and Pain Management

October 27-30, 2021  
Akra Otel, Antalya

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## SCIENTIFIC PROGRAM

[www.globalmigraine-pain.com/registration-accommodation/](http://www.globalmigraine-pain.com/registration-accommodation/)



28 OCTOBER 2021, THURSDAY

09.00 – 09.30	Opening Remarks
09.30 – 11.00	Changing Nature Of Headache Practice Aynur ÖZGE, Betül BAYKAN
09.30 – 09.45	Real Time Telemedicine – Based Headache History Paolo MARTELLETTI
09.45 – 10.00	Telemedicine Based Headache Diagnosis Cristina TASSORELLI
10.00 – 10.15	Transition From Traditional To Telemedicine Headache Practice Peter GOADSBY
10.15 – 11.00	Discussion Messoud ASHINA, Zaza KATSARAVA
11.00 – 11.30	Coffee Break
11.30 – 13.00	COVID-19 Headache Hayrunnisa BOLAY, Fayyaz AHMED
11.30 – 11.45	Clinical Manifestations And Management Of Headache in COVID-19 Ömer KARADAŞ
11.45 – 12.00	Diagnostic Criteria For COVID-19 Headache Betül BAYKAN
12.00 – 12.15	The Role Of Inflammation In COVID-19 Headache Hayrunnisa BOLAY
12.15 – 12.30	Neuroinflammatory Mediators in Headache Hülya Karataş KURŞUN
12.30 – 13.00	Discussion Patricia Pozo ROSICH, Ramez Reda MOUSTAFA
13.00 – 14.00	Oral Presentations Okan BÖLÜKBAŞI, Arife Çimen ATALAR
13.00 – 13.05	Mehmet TÖNGE, OP1
13.05 – 13.10	Ozan KAYAR, OP2
13.10 – 13.15	Elif Keleş GÜLNERMAN, OP3
13.15 – 13.20	Zahide Mail GÜRKAN, OP4
13.20 – 13.25	Aylin REYHANİ, OP5
13.25 – 13.30	Belgin MUTLUAY, OP6
13.30 – 13.35	Buse Çağla ARI, OP7
13.35 – 14.00	Discussion
14.00 – 15.00	Satellite (GSK) Women & Migraine What We Need To Know? Moderatör : Aynur ÖZGE Elif ILGAZ AYDINLAR
15.00 – 16.30	How To Manage A Challenging Case With Migraine Zaza KATSARAVA, Paolo MARTELLETTI
15.00 – 15.15	Diagnostic Gap In Migraine Zaza KATSARAVA
15.15 – 15.30	Management Gap In Migraine Dimos MITSIKOSTAS
15.30 – 15.45	Improving Quality Of Life In Migraine – Biopsychosocial Approach Simona SACCO
15.45 – 16.30	Discussion Rigmor JENSEN, Najib KISSANI
16.30 – 17.30	Oral Presentations Macit SELEKLER, Parvin ALLAHYAROVA
16.30 – 16.35	Ece YANIK, OP8
16.35 – 16.40	Kadir Oğuzhan SOYLU, OP9
16.40 – 16.45	Suna Aşkın TURAN, OP10
16.45 – 16.50	Somayeh Nasergivehchi, OP11
16.50 – 16.55	Naci Emre AKŞEHİRLİ, OP12
16.55 – 17.00	Ceren ALİŞ, OP13
17.00 – 17.05	Eren TOPLUTAŞ, OP14
17.05 – 17.30	Discussion



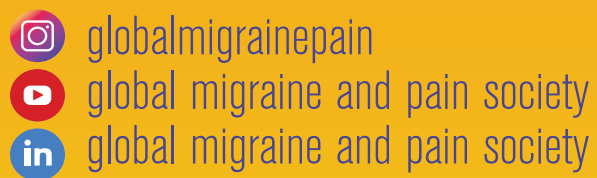
29 OCTOBER 2021, FRIDAY

- 09.30 – 11.00 Intracranial Pressure Changes Headaches  
Derya ULUDÜZ – Neşe ÇELEBİSOY
- 09.30 – 09.45 Diagnostic Gap in IPC Headaches  
Henrik SCHYTZ
- 09.45 – 10.00 Management Gap in IPC Headaches  
Neşe ÇELEBİSOY
- 10.00 – 10.15 Challenging Cases In Chronic Daily Headache  
Kirill SKOROBOGATYKH
- 10.15 – 11.00 Discussion  
Mansoureh TOGHA, Stefan EVERS
- 11.00 – 11.30 Coffee Break
- 11.30 – 13.00 Trigeminal Autonomic Cephalalgias  
Peter GOADSBY, Esme EKİZOĞLU
- 11.30 – 11.45 Footprints Of TACs  
Arne MAY
- 11.45 – 12.00 Coping With TACs In Emergency Room Settings  
Esme EKİZOĞLU
- 12.00 – 12.15 Coping With TACs In Outpatient  
Pinar Yalınay DİKMEN
- 12.15 – 13.00 Discussion  
Necdet KARLI, Massimo LEONE
- 13.00 – 14.00 Oral Presentations  
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- 13.00 – 13.05 Ayşe Nur Özdağ ACARLI, OP15
- 13.05 – 13.10 Murat GÜLTEKİN, OP16
- 13.10 – 13.15 Nevra ÖKSÜZ, OP17
- 13.15 – 13.20 Yonca ÜNLÜBAŞ, OP18
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Galcanzumab In Migraine Prevention  
Moderatör : Aynur ÖZGE  
Christian LAMPL  
Necdet KARLI
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Mi Ji LEE, Alan RAPOPORT
- 15.00 – 15.40 Persistent Idiopathic Facial Pain – Is A Specific Entity?  
Pro: Sait ASHINA Con: Hossein ANSARI
- 15.40 – 16.20 Monoclonal antibodies – Safe For Everyone?  
Pro: Lars EDVINSSON Con: Faisal Mohammad AMIN
- 16.20 – 17.00 Novel Therapies In Pediatric Migraine – Is Reliable?  
Pro: Andrew HERSHEY Con: Amy GELFAND
- 17.00 – 18.00 Oral Presentations  
Callixte KUATE, Samiye ULUTAŞ
- 17.00 – 17.05 Yağmur KARAMAN, OP22
- 17.05 – 17.10 Yalçın HACIOĞLU, OP23
- 17.10 – 17.15 İrem Hacısalihoğlu AYDIN, OP24
- 17.15 – 17.20 Berkan KAPLAN, OP25
- 17.20 – 17.25 Semih TAŞDELEN, OP26
- 17.25 – 17.30 Güneş Altıokka UZUN, OP27
- 17.30 – 17.35 Burcu POLAT, OP28
- 17.35 – 18.00 Discussion

*Lilly*

**30 OCTOBER 2021 – SATURDAY**

- 08.30 – 09.20 Turkic Linguistic Special Interest Group Session – Case Presentations  
(5 Cases: 8 min. Presentation + 2 min. Discussion for each Case)  
Esme EKİZOĞLU, Parvin ALLAHYAROVA
- 09.20 – 09.30 Coffee Break
- 09.30 – 11.35 Interventional Management In Headaches  
Aynur ÖZGE, Gül Köknel TALU
- 09.30 – 09.45 Peripheral Nerve Blocks  
İşin Ünal ÇEVİK
- 09.45 – 10.00 Trigger Point Injections And Dry Needle  
Didem AKÇALI
- 10.00 – 10.15 Ganglion Blocks  
Meltem UYAR
- 10.15 – 10.35 Real Life Experience About Botox In Migraine?  
Fayyaz AHMED
- 10.35 – 10.50 Botulinum Toxin Injections  
Tuğba TUNÇ
- 10.50 – 11.05 Peripheral Nerve Stimulations  
Süleyman ÖZYALÇIN
- 11.05 – 11.35 Discussion  
Hossein ANSARI, Derya ULUDÜZ
- 11.35 – 11.50 Coffee Break
- 11.50 – 13.20 Headache In Special Groups  
Ishaq Abu ARAFEH, İşin Ünal ÇEVİK
- 11.50 – 12.05 Is Childhood Migraine A Miniature Version Of Adult Migraine?  
Ishaq Abu ARAFEH
- 12.05- 12.20 How Will I Manage Elderly Headache?  
Fusun Mayda DOMAÇ
- 12.20 – 12.35 A Dilemma To Manage Headache During Pregnancy And Puerperium  
Elif Kocasoy ORHAN
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Vincenzo GUIDETTI, Miguel LAINEZ
- 13.20 – 14.20 Oral Presentations  
Halil ÇETİNGÖK, Rahşan KARACI
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- 13.25 – 13.30 Rabia Gökçen Gözübatk ÇELİK, OP30
- 13.30 – 13.35 Emel Ur ÖZÇELİK, OP31
- 13.35 – 13.40 Hacı Ali ERDOĞAN, OP32
- 13.40 – 13.45 Zerrin YILDIRIM, OP33
- 13.45 – 13.50 Hatice Reyhan ÖZGÖBEK, OP34
- 13.50 – 13.55 İbrahim ACIR, OP35
- 13.55 – 14.20 Discussion
- 14.20 – 16.20 Debate On Headaches Part-2 (15 min presentation per speaker + 5 min discussion)  
Otgonbayar LUVSANNOROV, Najib KISSANI
- 14.20 – 15.00 CSD Is A Key Trigger For Migraine Headache Attacks  
Pro: Hülya KARATAŞ KURŞUN Con: Hayrunnisa BOLAY
- 15.00 – 15.40 Healthy Microbiota Is Essential In Migraine?  
Pro: Mansoureh TOGHA Con: Doğa VURALI
- 15.40 – 16.20 Vestibular Migraine Is A Specific Entity  
Pro: Gülten AKDAL Con: Michael HALMAGYI
- 16.20 – 17.20 Oral Presentations  
Krishna Kumar OLI, Devrimsel Harika ERTEM
- 16.20 – 16.25 Lerze Furkan YAGHOUTI, OP36
- 16.25 – 16.30 Oneda ÇİBUKU, OP37
- 16.30 – 16.35 Kjenda ELPENORIA, OP38
- 16.35 – 16.40 Mustafa KURÇALOĞLU, OP39
- 16.40 – 16.45 Buse Çağla ARI, OP40
- 16.45 – 16.50 Hasan Armağan UYSAL, OP41
- 16.50 – 17.20 Discussion
- 17.20 – 17.50 Closing Remarks



**Dear Colleagues,**

On behalf of The Global Migraine&Pain Society Organization Committee, I extend a warm and cordial invitation to you.

The 2<sup>nd</sup> Global Migraine&Pain Summit, 5<sup>th</sup> MENA Meeting, 3<sup>rd</sup> Turkish African Meeting of Headache and Pain Management will be held between 27-30 October 2021 at Akra Hotel Antalya, Turkey under the sponsorship of the International Headache Society (IHS), supported by European Headache Federation (EHF).

The summit will discuss the development and utilization of pain management efficiently and sustainably, for the benefit of the current and future generations and to support young education and their future involvement in the Pain Treatments.

At our summit, where the most prestigious experts from all over the world will be speakers and will be held in English; I sincerely believe that it will equal its record by recruiting both online and physical participants from all over the world.

I would be delighted to have you present at our Hybrid Summit event.

Yours sincerely,

Aynur Özge

On Behalf Of The Organization Committee



### OP1

## Effect of Gamma Knife Radiosurgery on Secondary Trigeminal Neuralgia

Mehmet Töngel, Ömer Yazıcı<sup>1</sup>

Department of Neurosurgery, Istanbul Medipol University, <sup>1</sup>Department of Radiation Oncology, Istanbul Medipol University, Istanbul, Turkey

**Address for correspondence:** Assistant Prof. Mehmet Töngel,

Department of Neurosurgery, Istanbul Medipol University, Medipol Mega Hospital 2<sup>nd</sup> Floor, TEM Otoyolu Goztepe Cikisi N:1, Bagcilar, Istanbul, Turkey.

E-mail: tonge\_m@yahoo.com

**Background:** Trigeminal neuralgia is etiologically classified into three main subgroups; idiopathic, primary and secondary. Secondary trigeminal neuralgia mostly requires both the treatment of underlying pathology and pain.

**Aim:** In this article, we discuss our experience on gamma knife radiosurgery for secondary trigeminal neuralgia caused by tumor compression.

**Methods:** The clinical and radiological follow-up of 11 patients with secondary trigeminal neuralgia caused by tumor compression at any level along the nerve route, refractory to medical treatment underwent gamma knife radiosurgery for tumor between 2016-2021 were presented.

**Results:** Subjective symptom relief was achieved in all patients within days or weeks after gamma knife treatment for tumor. All patients were radiologically diagnosed as either meningiomas (n: 7) or schwannomas (n: 4). Mean follow-up after gamma knife radiosurgery was 21 months (range 3-72). Barrow Neurological Institute pain severity score decreased by 1 to 4 points in all patients at early stage and increased in advance in 4 patients during follow-up. Two of four patients underwent retrogasserian radiofrequency thermablation and two others required medical treatment. Tumor control was achieved in all patients.

**Conclusions:** Gamma Knife Radiosurgery is an effective treatment option in the management of both idiopathic trigeminal neuralgia and benign tumors such as meningiomas and schwannomas located at eloquent or surgically challenging areas. Radiosurgery as a low risky and less invasive procedure in comparison to microsurgery should be kept in mind for the treatment of patients with concurrent tumor and refractory secondary trigeminal neuralgia.

**KEYWORDS:** *Gamma Knife, meningioma, radiosurgery, schwannoma, secondary trigeminal neuralgia*

### OP2

## Qualitative Analysis of School-Age Children's Drawings of Headache: Migraine Expressions with Pictures

Ozan Kayar, Buse Aşci, Gülen Güler Aksu<sup>1</sup>, Fevziye Toros<sup>1</sup>, Aynur Özge<sup>2</sup>

Department of Psychology, Faculty of Letters, Çankırı Karatekin University, Çankırı, <sup>1</sup>Department of Child and Adolescent Psychiatry, Medical Faculty, Mersin University, <sup>2</sup>Department of Neurology, Medical Faculty, Mersin University, Mersin, Turkey

**Address for correspondence:** Dr. Ozan Kayar,

Department of Psychology, Faculty of Letters, Çankırı Karatekin University, Çankırı, Turkey.

E-mail: pskozan@gmail.com

This study aims to examine how to express their headache experience with their own drawings in school age children diagnosed with episodic migraine. The sample of the study consists of children aged between 6 and 11. In data collection process of the research, the expert asked the children before the interview, "Can you draw a picture describing your headache?" as a direction. In this process, an A4 paper and 9 different colored pencils and crayons were used as materials. As a result, the drawings obtained from 76 children were evaluated by two clinical psychologists and selected 56 drawings that are suitable for qualitative analysis were analyzed with descriptive analysis. The contents of the pictures drawn by the children were analyzed according to 4 themes: facial expression, posture, color and the other elements. According to the analysis, it was found that the category of tears (42.85%) was frequently repeated in facial expression themes. According to the color theme, black (50%), yellow (44.64%) and blue (44.64%) were the three most frequently used colors. Additionally, it was determined that the vast majority

of children (82.14%) drew themselves alone while 17.85 percent of the children drew doctor or family members together. Also, it was observed that the bed, stretcher, and lightning around head drawings were recurrent categories. The results of the study provide a crucial perspective to researchers and experts working in the field on how migraine-type headaches in school-age children are depicted with drawings.

**KEYWORDS:** *Children, drawings of headache, episodic migraine*

### OP3

## Evaluation of the Neurodevelopmental Effects and Mechanisms of Phthalates in Glial Cell Culture

Elif Keleş Gülnerman<sup>1,2</sup>, Arzu Aral<sup>3,4</sup>, Zübeyir Elmazoğlu<sup>5</sup>, Mehmet Ali Ergün<sup>6</sup>, Elif Gülçiçek Abbasoglu Topa<sup>2</sup>, Hasan Hüseyin Kazan<sup>6</sup>, Hayrünnisa Bolay<sup>2,4,7</sup>

<sup>1</sup>Department of Pediatrics and Neonatology, Gazi University Faculty of Medicine, <sup>2</sup>Neuropsychiatry Centre, Gazi University, Besevler, <sup>3</sup>Department of Immunology, Faculty of Medicine, İzmir, Turkey İzmir Demokrasi University, <sup>4</sup>NÖROM, Nörobilim ve Nöroteknoloji Mükemmeliyet Merkezi, <sup>5</sup>Department of Chemistry, Middle East Technical University, <sup>6</sup>Department of Medical Genetics, Gazi University Faculty of Medicine, <sup>7</sup>Department of Neurology and Algology, Gazi University Faculty of Medicine, Ankara, Turkey

**Address for correspondence:** Dr. Elif Keleş Gülnerman,

Department of Pediatrics and Neonatology, Gazi University Faculty of Medicine, İzmir, Turkey İzmir Demokrasi University, Ankara, Turkey.

E-mail: elifkeles.dr@gmail.com

**Background:** Phthalates are used to convert the hard plastic polyvinyl chloride (PVC) into a flexible plastic. Di-(2-Ethylhexyl) phthalate (DEHP) is commonly used in medical products. Phthalates can cross the placenta and the blood-brain barrier, causing neurodevelopmental damage in vivo and in vitro.

**Aim:** The aim of the study is to understand the mechanism of neuroinflammation in glial cells caused by phthalates, by compromising cellular iron homeostasis.

**Methods:** BV-2 neonatal microglial cells were cultured and incubated with phthalate at doses of 1-10 mM overnight. Cellular toxicities were determined by MTT assay. Intracellular ferrous ( $\text{Fe}^{2+}$ ) and total iron levels, intracellular reactive oxygen species (ROS) levels were measured by spectrophotometric approach. Cell death mechanisms were followed by Apoptosis/Necrosis Ratio by Acridine Orange/Ethidium Bromide dual staining. Lysosomal and mitochondrial integrity was figured out by Hoechst/Neutral Red/Janus Green B triple staining. Ferritin and CD11b immunoreactivity and IL-1 $\beta$ , and IL-18 cytokine levels were followed by ELISA method. Expression levels of iron metabolism-related genes (ferritin analysis, DMT1 (importer) and ferroportin (exporter)) were determined by RT-qPCR. All tests were repeated three times separately and data were analyzed by either Student's t test or ANOVA, and were significant when  $p < 0.05$ .

**Results:** Intracellular  $\text{Fe}^{2+}$  levels increased dramatically at 1-10 mM concentrations of phthalate. Total iron levels, which mediate the reduction of  $\text{Fe}^{+3}$  ion to  $\text{Fe}^{+2}$  ion, also increased statistically. Free iron was found to be higher than total iron for phthalate-treated cells. At 1-10 mM of phthalate doses, apoptosis increased compared to non-treated controls. It was observed that the lysosomal and mitochondrial integrity was impaired, ferritin and CD11 staining, IL-1 $\beta$  and IL-18 cytokine levels, Ferritin-L, DMT-1, and Ferroportin expressions were increased upon phthalate treatment.

**Conclusion:** Phthalate exposure causes inflammation and neuronal death via the ferroptosis and inflammasome pathway mediated by iron and ROS. DEHP exposure is associated with neuroinflammation and neuronal loss in the developing brain, especially in hospitalized children and infants.

**KEYWORDS:** *Ferritin, iron metabolism, microglia, neuroinflammation, phthalate*

### OP4

## Determinant of Structural Changes in Migraine Patients

Zahide Mail Gurkan, Aygöl Tantik Pak, Sebahat Nacar Dogan<sup>1</sup>, Yildizhan Sengul

Department of Neurology, Gaziosmanpasa Training and Research Hospital, <sup>1</sup>Department of Radiology, Acıbadem Mehmet Ali Aydınlar University Atakent Hospital, Istanbul, Turkey

**Address for correspondence:** Dr. Zahide Mail Gürkan  
Department of Neurology, Gaziosmanpaşa Training and Research Hospital, Istanbul, Turkey.  
E-mail: zahidemailgurkan@gmail.com

**Objective:** The aim of this study is to investigate alterations of brain white matter structures in migraine (CM) patients.

**Methods:** 58 migraine patients and 51 healthy controls(HCs) were included in this study who applied to the neurology outpatient clinic of Gaziosmanpaşa Training and Research Hospital. This study was conducted prospectively, and Ethics Committee approval was obtained. Socio-demographic characteristics of the patients, family history, disease duration, presence of aura, monthly attack frequency, analgesics and the number of monthly analgesic use has been recorded. Pain in migraine patients was evaluated with the Visual Analogue Scale (VAS) and Migraine Disability Rating Scale (MIDAS). Brain microstructural evaluation of the patients was analysed using diffusion tensor imaging (DTI) studies. The correlation between measurements obtained from white matter structures in EM and CM was examined.

**Results:** 48 of the 58 migraine patients included in the study were episodic migraine(EM), 10 were chronic migraine(CM). 49 of the patients (39 EM, 10 CM) and 42 of the HCs were women. The mean age of patients was  $34.98 \pm 9.53$ , HCs was  $33.84 \pm 11.06$ . There is no statistically significant difference between patients and healthy controls in terms of age and disease duration. The mean frequency of migraine attacks with EM was  $6.45 \pm 3.40$ , with CM was  $16.26 \pm 2.04$ . The mean VAS score was  $8.87 \pm 1.16$  with EM,  $8.90 \pm 1.44$  with CM. The mean MIDAS score was  $2.81 \pm 1.06$  with EM,  $3.90 \pm 0.31$  with CM. When the values obtained by DTI from patients with EM and CM were compared, FA values of the right and left putamen showed a statistically significant difference( $p=0.02$ ,  $0.009$ ).

**Conclusion:** Changes in white matter structures in migraine patients have been shown in previous studies. In our study, data were obtained that there may be some changes between episodic and chronic migraine patients. It is worth investigating that episodic and chronic migraine can be different entities.

## OP5

# Gender Differences in Idiopathic Intracranial Hypertension: A Single Center Experience of 72 Cases

Aylin Reyhani, Eren Gözke

Department of Neurology, University of Health Sciences, Fatih Sultan Mehmet Education and Research Hospital, Istanbul, Turkey

**Address for correspondence:** Dr. Aylin Reyhani  
Department of Neurology, University of Health Sciences, Fatih Sultan Mehmet Education and Research Hospital, Istanbul, Turkey.  
E-mail: reyhaniaylin@yahoo.com

**Background:** Idiopathic intracranial hypertension (IIH) is a disorder of unknown etiology predominantly affecting women of childbearing age. It is rarely encountered in men. The aim of this study was to compare the characteristics of male and female patients with IIH.

**Methods:** We retrospectively identified the medical records of the patients with a diagnosis of IIH who attended between 2012 and 2020. The diagnosis was based on the modified Dandy criteria. Data including body mass index (BMI), neuroophthalmologic examination and cerebrospinal fluid (CSF) analysis were investigated.

**Results:** A total of 72 consecutive patients with a mean age of  $38.0 \pm 12.2$  years were included in the study. Of these, 56 (77.8%) patients were female and 16 (22.2%) patients were male. The mean BMI of the patients was  $32.0 \pm 7.3$  kg/m<sup>2</sup> and the mean CSF opening pressure was  $35.2 \pm 11.3$  cmH<sub>2</sub>O. The BMI measurements were significantly higher in female patients compared to the male patients ( $33.2 \pm 7.7$  kg/m<sup>2</sup> vs.  $28.9 \pm 5.2$  kg/m<sup>2</sup>,  $p=0.041$ ). The female patients were found to have higher CSF opening pressure measurements than male patients ( $36.3 \pm 10.9$  cmH<sub>2</sub>O vs.  $30.9 \pm 12.3$  cmH<sub>2</sub>O,  $p=0.030$ ). No statistically significant difference was found in terms of age, papilledema severity, visual acuity and treatment response between the female and male patients.

**Conclusion:** Our results suggest that rise in BMI and CSF opening pressure measurements may play a less important role in the pathophysiology of male patients with IIH compared to the female patients with IIH which may help for an improved understanding of the underlying mechanism of gender preferences of IIH.

**KEYWORDS:** Body mass index, cerebrospinal fluid opening pressure, gender differences, idiopathic intracranial hypertension

## OP6

## A Side Effect after COVID-19 Vaccination: Headache Characteristics

Belgin Mutluay, Onur Akan<sup>1</sup>

Department of Neurology, SBU Bakirkoy Prof. Dr. Mazhar Osman Mental Health and Neurological Disease Training and Research Hospital, <sup>1</sup>Department of Neurology, SBU Okmeydanı Training and Research Hospital, Prof. Dr. Cemil Taşçıoğlu State Hospital, Istanbul, Turkey

**Address for correspondence:** Dr. Belgin Mutluay

Department of Neurology, SBU Bakirkoy Prof. Dr. Mazhar Osman Mental Health and Neurological disease Training and Research Hospital, Istanbul, Turkey.

E-mail: belginmutluay@gmail.com

**Background:** Headache is a common and sometimes difficult symptom in COVID-19 patients.

**Aim:** We investigated the relationship between headache and Sinovac vaccine, which was firstly used in healthcare workers in the fight against the pandemic. After obtaining ethical approval from the Ministry, 477 healthcare workers vaccinated with a double dose of Sinovac were interviewed.

**Methods:** A questionnaire including demographic information, previous headache history, characteristics of headache developing during and after vaccination, and other accompanying side effects were questioned face-to-face.

**Results:** 53% of the participants were female and 47% male. The mean age of our study group aged 20-66 years was 37.64±10.43, 37.41±10.6 in women, 37.9±10.2 in men. Previous Covid infection was reported in 13.2% participants. Overall headache rate was found in 18.8%, however after Sinovac vaccine administration headache was rated in 33.0%. Post vaccine pain character was similar to their former primary headaches in 59%, but differed in 41%. Post-vaccination headache occurred after an average of 12.9±16.5 hours and persisted for 30.0±29.4 hours (1-168 hours). These headaches generally spread to the whole head (88%), less frequently bilateral frontal or temporal localization. According to the visual analog scale (VAS), the mean pain intensity was determined as 6.55±1.9 (2-10). Although high VAS scores were reported, pain did not prevent them from continuing their work in 98.8% of the survivors. No one was hospitalized for pain.

**Conclusion:** Headache is an important symptom in vaccination, as in Covid -19 disease. However, post- vaccine headache responds more easily to treatment.

**KEYWORDS:** COVID-19, post-vaccine headache, sinovac

## OP7

## Ptosis After the Treatment of Migraine with Onabotulinumtoxin a: An Underdiagnosed Case with Myasthenia Gravis

Hayal Toktaş, Buse Çağla Ari<sup>1</sup>

Department of Neurology, Atasehir Memorial Hospital, <sup>1</sup>Department of Neurology, Bahcesehir University Medical Faculty, Istanbul, Turkey

**Address for correspondence:** Assist. Prof. Buse Çağla Ari

Department of Neurology, Bahcesehir University Medical Faculty, Istanbul Turkey.

E-mail: juvelia@gmail.com

**Background:** OnabotulinumtoxinA is effective in reduction of headache frequency and severity in Chronic migraine(CM). Diffusion of OnabotulinumtoxinA disturb neuromuscular transmission in extraocular muscles and may result as positive electrodiagnostic findings regarding neuromuscular transmission disorders.

**Aim:** We report a patient with Myasthenia Gravis(MG).

**Case Report:** A 49-year-old female patient presented with headache, ptosis and diplopia. On history, she had headache of severe, recurrent, pulsatile attacks on vertex; associated by nausea, photo-and-phonophobia. Cranial magnetic resonance imaging(MRI) did not detect any abnormality; so, she was diagnosed as Migraine. There was an increase on her attacks, she was administrating 15-non-steroidal anti-inflammatory drugs per day; so she was started a treatment of OnabotulinumtoxinA; but she developed ptosis. On her neurological evaluation there was a ptosis on left eye, diplopia on left lateral gaze. When history detailed, she revealed ptosis increased at night. According to these

findings, we thought this might be a neuromuscular junction disorder rather than a side effect of OnabotulinumtoxinA. There was a positivity of Acetylcholine-Receptor-antibody. Repetitive nerve stimulation(RNS) was not remarkable. Thoracic-computed-tomography(CT) did not reveal of thymoma. On single-fiber EMG, average jitter value was above the normal. According to the evaluation, cause of symptoms was thought to be related to MG. She was prescribed as pyridostigmine 60mg three-times-a-day. After the treatment, her symptoms improved.

**Results:** OnabotulinumtoxinA is considered when patients have failed other prophylactic preventatives. Its primary action is to block the presynaptic release of acetylcholine at neuromuscular junction, which results in temporary paralysis of muscles. The secondary action involves the inhibition of a range of neurotransmitters.

**Conclusion:** In patients with ptosis developed after OnabotulinumtoxinA, it would be beneficial not to ignore the possibility of MG, before considering it as a complication.

**KEYWORDS:** *Migraine, myasthenia gravis, onabotulinumtoxin A, ptosis*

## OP8

### Risk Factors and Effects of Prior Headache on Post-Lumbar Puncture Headache

Ece Yanık, Doğa Vuralı<sup>1,2,3</sup>, Tuğba Tunç

Department of Neurology, Gazi University Faculty of Medicine, <sup>1</sup>Department of Neurology and Algology, Gazi University Faculty of Medicine, <sup>2</sup>Neuropsychiatry Center, Gazi University, Besevler, <sup>3</sup>Neuroscience and Neurotechnology Center of Excellence (NÖROM), Ankara, Turkey

**Address for correspondence:** Dr. Ece Yanık

Department of Neurology, Gazi University Faculty of Medicine, Besevler, Ankara, Turkey.

E-mail: eceturksoy@gmail.com

**Background:** The most common complication associated with lumbar puncture is post-dural puncture headache(PDPH). The incidence of PDPH varies depending on multifactorial risk factors. Patient-related and LP procedure-related risk factors are still controversial.

**Aim:** In this prospective study, we aimed to evaluate risk factors for PDPH, the features of previous headaches and their effect on the development of PDPH, as well as risk factors for the development of PDPH within the first 24-hours(immediate) or after 24-hours(delayed).

**Methods:** 116 patients underwent LP were prospectively analyzed. Clinical and laboratory findings of the patients, information related to LP and the history of prior headache were examined for risk factors.

**Results:** The presence of long and frequent attacks independent of the type of prior headache and a history of migraine accompanied by osmophobia are independent risk factors for the development of PDPH. In immediate and delayed-onset PDPH evaluation; lesser volume of CSF collected, increased frequency of headache attacks, diagnosis of idiopathic intracranial hypertension and acetazolamide use were risk factors.

**Conclusion:** This is the first study to detail the history of prior headache in the development of PDPH and to examine the risk factors for immediate and delayed PDPH. It was shown for the first time that patient-related factors may be more important in terms of the development of PDPH and procedure-related factors in terms of the time of occurrence of PDPH. These results may help to elucidate the pathophysiology of PDPH development. Determination of the risk factors for PDPH, may help to provide a more accurate diagnosis and treatment.

**KEYWORDS:** *Headache, idiopathic intracranial hypertension, onset time of PDPH, osmophobia, postdural puncture headache*

## OP9

### Nlrp3 Inflammasome Expression in the Enteric Nervous System after Cortical Spreading Depolarization

Kadir Oğuzhan Soylu<sup>1</sup>, Gökçe Gürler<sup>1</sup>, Eda Derle Çiftçi<sup>1,2</sup>, Hülya Karataş-Kurşun<sup>1,3</sup>, Muge Yemisci<sup>1,3,4</sup>



<sup>1</sup>Institute of Neurological Sciences and Psychiatry, Hacettepe University, <sup>2</sup>Department of Neurology, Faculty of Medicine, Başkent University, <sup>3</sup>Neuroscience and Neurotechnology Center of Excellence (NÖROM), <sup>4</sup>Department of Neurology, Faculty of Medicine, Hacettepe University, Ankara, Turkey

**Address for correspondence:** Dr. Kadir Oğuzhan Soylu

<sup>1</sup>Institute of Neurological Sciences and Psychiatry, Hacettepe University, Ankara, Turkey.

E-mail: kadirsoylu@outlook.com

**Background:** Current evidence demonstrates that gut microbiota can have a role in the pathophysiology of migraine through inflammatory mediators, neuropeptides and bacterial products. Inflammasome activation in the gut may have a role in this interaction by shaping peripheral and central neurogenic inflammatory responses. There is evidence of the involvement of inflammasomes in migraine. However, the role of NLRP3 inflammasome via brain-gut axis in migraine needs to be elucidated.

**Aim:** In this study, we aimed to investigate the NLRP3 inflammasome expression in the enteric nervous system neurons at acute and subacute time points after cortical spreading depolarization (CSD) induction in mice.

**Methods:** We induced CSD optogenetically in adult female Thy1-ChR2-YFP mice (22-27g). At 15 minutes, 5 hours and 24 hours after CSD, we sacrificed mice and collected their distal ileum and colon. These gut sections of 20microns-thick were immunohistochemically stained by using antibody against NLRP3 inflammasome. We examined sections using confocal laser scanning microscopy with appropriate lasers. Neurons were visualized under the confocal microscope by their 513-527 nm fluorescence because of the YFP tag of the optogenetic mice.

**Results:** At 15 minutes after CSD, there was no NLRP3 expression in submucosal neurons of ileum, and only confined expression was seen in colon. At 5 hours after CSD, there was strong expression of NLRP3 in submucosal neurons both in ileum and colon. NLRP3 expression in submucosal neurons was present in both ileum and colon 24 hours after CSD, although weaker than 5 hours.

**Conclusion:** CSD can cause an increase in the NLRP3 inflammasome expression in neurons of the enteric nervous system. This brain and gut interaction in turn may affect nociceptive responses seen in migraine patients through inflammatory mediators.

**KEYWORDS:** CSD, gut, inflammasome, migraine, NLRP3

## OP10

# Mediating Effect of Pain Anxiety, Catastrophizing Thoughts, Depression and Anxiety on Pain Related Disability in People with High Impact Chronic Low Back Pain

İlteriş Ahmet Şentürk, Suna Aşkın Turan<sup>1</sup>

Department of Algology, Bağcılar Training and Research Hospital, <sup>1</sup>Department of Algology, Istanbul Cam and Sakura City Hospital, Istanbul, Turkey

**Address for correspondence:** Dr. Suna Aşkın Turan

Department of Algology, Istanbul Cam and Sakura City Hospital, Istanbul, Turkey.

E-mail: sunaaskin1@gmail.com

**Objective:** To investigate whether pain anxiety, catastrophizing thoughts, depression and anxiety mediates on pain-related disability in patients with high-impact chronic low back pain (HICBP) and to evaluate the hypothesis that pain disability correlates positively with pain intensity.

**Methods:** High-impact chronic pain (HICP) diagnosis was made using the Graded Chronic Pain Scale-revised (GCPS-R). Pain-related anxiety: Catastrophizing thoughts: Pain Catastrophizing Scale (PCS); pain intensity: Numerical Rating Scale (NRS); functional disability: Quebec Back Pain Disability Scale (QBPDS); psychological assessments: was evaluated with the Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI).

**Results:** 148 patients with HICBP were included in the study. Statistically significant associations between pain-related anxiety, catastrophizing thoughts, pain intensity, and disability ( $p < 0.001$ ). When the mediation results were evaluated: it was found that pain intensity had a strong positive effect on pain-related disability ( $\beta=0.490$ ;  $p < 0.001$ ;  $R^2=0.24$ ) and to which pain-related anxiety (mediator) was added, it was found that both direct effect ( $p < 0.001$ ) and indirect effect ( $p = 0.011$ ) were significant.

**Discussion:** Multidisciplinary approaches, including mental and social assessment, are required to provide optimal treatment for patients with HICBP.

**KEYWORDS:** *Catastrophizing thoughts, high-impact chronic pain, pain related anxiety*

## OP11

# Headache Following Vaccination against COVID-19 among Healthcare Workers: A Cross-Sectional Study in Iran with a Meta-Analytic Review on the Literature

*Somayeh Nasergivehchi*

Tehran University of Medical Sciences, Baharloo University Hospital, Tehran, Iran

**Address for correspondence:** Dr. Somayeh Nasergivehchi,  
Tehran University of Medical Sciences, Baharloo University Hospital, Tehran, Iran.  
E-mail: snasergivehchi@gmail.com

**Background:** There is strong evidence of debilitating headaches following vaccination against Covid-19 with various brands, especially among medical staff. However, there are very few studies on the characteristics of this headache and its related factors, especially among personnel who have previously experienced the Covid-19 disease. Hence, we aimed to evaluate and compare the incidence of headache following injection of different types of commonly used Covid-19 vaccines as well as to determine factors related to the incidence of headache following vaccination among the selected Iranian healthcare workers previously suffering from Covid-19.

**Methods:** A group of 334 personnel initially suffered from Covid-19 with different intensities and were vaccinated (at least one month after discharge without any suspicious Covid-19 related symptoms) by different Covid-19 vaccines were assessed. Baseline information, characteristics of headache, and specifications of inoculated vaccines were reviewed.

**Results:** Overall, 39.2% suffered from post-vaccination headache, as migraine headache in 51.1%, tensional type headache in 27.4%, and other types in 21.5%. Headache appeared less than 24 hours of vaccination in most patients (83.2%), whereas the pattern of headache was found to be delayed in 16.8% (from 48 hours to even 30 days). In most patients, the headache had the form of compressive. The prevalence of post-vaccination headaches was significantly different according to the type of vaccines used. The highest rates were reported for AstraZeneca, followed by Sputnik V. In the multivariate logistic regression analysis, the vaccine brand, female gender, and initial COVID-19 severity were the main determinants for predicting post-vaccination headache.

**Conclusion:** It is expected one-third of the healthcare workers suffer from headaches following vaccination against Covid-19, which is more likely to occur in women and those with a history of severe Covid-19.

**KEYWORDS:** *COVID vaccine, headache, meta analysis*

## OP12

# Our Clinical Experience of 25 Patients with Trigeminal Neuralgia

*Naci Emre Akşehirli, Berkhan Genç, Mehmet Töngel*

Department of Neurosurgery, İstanbul Medipol University, İstanbul, Turkey

**Address for correspondence:** Dr. Naci Emre Akşehirli,  
Department of Neurosurgery, İstanbul Medipol University, İstanbul, Turkey.  
E-mail: emreaksehirli@gmail.com

**Background:** Trigeminal neuralgia (TN) is one of the most common causes of facial pain seen in dental and neurologic practices. Antiepileptic drugs (AEDs) are considered first-line therapy for TN with different efficacy, and carbamazepine is the drug of choice. Treatment modality options include microvascular decompression (MVD), percutaneous trigeminal rhizotomies (PSR) and gamma knife radio surgery.

**Aim:** We will share our experience with MVD, gamma knife and PSR in trigeminal neuralgia patients who did not respond to medical treatment in our clinic.

**Method:** PSR and gamma knife patients who were performed in our clinic between the years 2016 and 2021 were analyzed retrospectively. We use radiofrequency ablation (RFA) as a trigeminal rhizotomy method in our clinic.

**Results:** There are 16 gammaknife, 9 RFA and 1 MVD patients treated in our clinic. Of the patients who underwent Gamma knife, four had MVD before, one had RFA five times before, and one had MVD 2 years later. Six of 25 patients needed more than one treatment modality.

**Conclusion:** In the treatment of TN, although there are many treatment modalities in cases that cannot be controlled with medication, the application of only one of the treatment modality may not be sufficient to relieve the pain. More than one treatment modality can be used according to the needs of the patients. TN treatment is difficult and requires a multidisciplinary approach.

**KEYWORDS:** *Gamma knife, MVD, PSR, trigeminal neuralgia*

## OP13

### The Association between Response to Bilateral Greater Occipital Nerve Block in Chronic Migraine and Sensorimotor Gating in Brainstem

Ceren Alis, Aysegul Gunduz<sup>1</sup>, Ugur Uygunglu<sup>1</sup>, Meral Erdemir Kiziltan<sup>1</sup>

Department of Neurology, Istinye State Hospital, <sup>1</sup>Department of Neurology, Cerrahpasa School of Medicine, Istanbul University-Cerrahpasa, Istanbul, Turkey

**Address for correspondence:** Dr. Ceren Alis,  
Department of Neurology, Istinye State Hospital, Istanbul, Turkey.  
E-mail: cerencivcik@gmail.com

**Background:** Though the precise mechanism is unknown, some evidence points out that the greater occipital nerve (GON) block affects the anatomical connections between the trigeminal nerve and upper cervical sensory fibers.

**Aim:** We aimed to investigate the inhibitory and excitatory circuits related to trigeminal nerve at brainstem before and after GON block in chronic migraine.

**Methods:** This prospective study consisted of 15 patients with chronic migraine who experienced GON block for migraine and 14 healthy subjects. We recorded blink reflex (BR), excitability recovery of BR, and prepulse inhibition (PPI) of BR in all participants. The recordings were done twice (before, T0 and ten days after the GON block, T1). Response to the block was regarded when there was more than a 30% reduction in severity or frequency of headache.

**Results:** Compared to healthy subjects, patients with migraine had significantly higher R2 magnitude and less PPI. Nine patients were considered responders within ten days following the GON block. The only difference between responders and nonresponders was the less PPI at baseline in nonresponders group compared to responders ( $p=0.030$ ). After the GON block, PPI did not change among nonresponders, however, it became abnormal among patients with a good response. The R2 magnitude or recovery percentage did not change significantly after the GON block or according to the presence of response.

**Conclusion:** We showed increased excitability and reduced inhibition in patients with chronic migraine. Change in PPI, i.e. change in sensorimotor gating, is related with prognosis after the GON block. Abnormal sensorimotor gating may be electrophysiological marker of response after GON block.

**KEYWORDS:** *Blink reflex, greater occipital nerve block, Migraine, prepulse inhibition*

## OP14

### Post-COVID and Post-Vaccine Headache of the Same 10 Patients

Eren Toplutaş, Burcu Polat

Department of Neurology, Istanbul Medipol University, İstanbul, Turkey

**Address for correspondence:** Dr. Eren Toplutaş  
Department of Neurology, Istanbul Medipol University, İstanbul, Turkey.  
E-mail: erentoplutas@gmail.com

Headache during and after COVID-19 infection is a well-defined condition. Headache has also been reported after the coronavirus vaccine. In our study, we aimed to examine the pain characteristics and clinical follow-up of ten patients with post-COVID and post-vaccine headaches. Ten patients who were referred to the Neurology outpatient clinic with the complaint of ongoing headache after COVID-19 disease and who didn't use prophylaxis with the diagnosis of headache before were included in the study. The post-vaccination headache status of the patients was re-evaluated. The mean age of 9 female and one male patient were  $39.8 \pm 9.82$  (Mean $\pm$ SD). Cranial MR images of all patients were evaluated as normal. 70% of the patients specified that there was a difference in the frequency, severity, or character of headache after COVID-19. Eight of the patients had a previous headache. While there was a significant difference between the frequency of pain ( $p=0.006$ ) and the need for NSAID use ( $p=0.019$ ) before and after COVID-19, no significant difference was found in pain severity ( $p=0.084$ ). Eight of our patient group were vaccinated with BioNTech and two with Sinovac in full dose. Headache was observed in half of the patients after vaccination. Headache is one of the most common symptoms of COVID-19. Primary headache may worsen after COVID-19. The frequency of headaches and the need for NSAID use may increase during this period. Transient headache is also seen after vaccination, and patients experiencing COVID-19 related headaches may be at higher risk for post-vaccine headaches.

## OP15

### Coronavirus Disease (COVID-19) Pandemic Headaches in Adolescents: Big Problems Have to Manage Under the Iceberg

Ayşe Nur Özdağ Acarlı<sup>1</sup>, Gülen Güler<sup>1</sup>, Salih Ay<sup>2</sup>, Elif Çoban<sup>2</sup>, Haşim Gezen<sup>3</sup>, Pınar Topaloğlu<sup>3</sup>, Zuhal Yapıcı<sup>3</sup>, Asena Ayça Özdemir<sup>4</sup>, Fevziye Toros<sup>1</sup>, Aynur Özge<sup>5</sup>

<sup>1</sup>Department of Neurology, Ermenek Government Hospital, Karaman, <sup>1</sup>Department of Child and Adolescent Psychiatry, Medical Faculty, Mersin University, Mersin, <sup>2</sup>Department of Pediatrics, Ermenek Government Hospital, Karaman, <sup>3</sup>Department of Neurology, Child Neurology Unit, İstanbul Medical Faculty, İstanbul University, İstanbul, <sup>4</sup>Department of Biostatistics, Medical Faculty, Mersin University, <sup>5</sup>Department of Neurology, Medical Faculty, Mersin University, Mersin, Turkey

**Address for correspondence:** Dr. Ayşe Nur Özdağ Acarlı,  
Department of Neurology, Ermenek Government Hospital, Karaman, Turkey.  
E-mail: nur\_ozdag\_87@hotmail.com

**Background:** Headache is the most common neurologic issue in children and adolescents, and various factors such as school, electronic devices, mental health problems, and socio-economic conditions can contribute to headache. Coronavirus disease (COVID-19) pandemic has made striking changes on every aspect of life as well as all of those factors.

**Aim:** To investigate the effects of COVID-19 pandemic on headache in adolescents.

**Methods:** Ten to eighteen years old attendees were included to the multicenter study. Questions explored the presence and features of headache, academic performance, exposure to COVID-19, exposure to electronics. The scales of Patient Health Questionnaire, Generalized Anxiety Disorders Scale and Coronavirus Anxiety Scale were used.

**Results:** The headache frequency is 89% (210/236; 150 female and 86 male) in adolescents. Among them, 9% reported new onset headache during the pandemic whereas 29% reported worsening in severity and frequency of headache attacks. The depression, general anxiety and coronavirus anxiety were significantly more common in those cases compared to others who had headache attacks in same frequency or fewer than before. Even the percentages of subjects who are displeased with online education are similar between two groups, a reduction in school effort and a decrease in student achievement were reported more common in those patients with worsened or new onset headache. Those respondents have also declared the increased screen time during online education as a trigger for headache attacks, more frequently.

**Conclusion:** The psychosocial consequences of the current pandemic are likely to exacerbate headache among adolescents. Identifying any headache triggering factors related to the pandemic is important to implement lifestyle modifications to reduce the future burden of the diseases.

## OP16

### The Evaluation of Ego-Resilience and Personality Profiles Patients with Chronic Migraine

Murat Gültekin, Recep Baydemir, Güner Yılmaz, Orhun Öztürk<sup>1</sup>

Department of Neurology, Erciyes University Faculty of Medicine, Kayseri, Turkey, <sup>1</sup>Department of Statistics, Hacettepe University, Ankara, Turkey

**Address for correspondence:** Associate. Prof. Murat Gültekin,  
Department of Neurology, Erciyes University Faculty of Medicine, Kayseri, Turkey.  
E-mail: gultekin@erciyes.edu.tr

**Background:** Migraine is a chronic disorder that manifests itself with headaches. The life quality of migraine patients is affected badly comparing with healthy people. High degrees of depression, anxiety and neuroticism were reported among migraine patients. However, there is limited research that studies the effects of ego resilience among migraine patients. Ego resilience is a personality dimension that influences lives of people positively.

**Aim:** In this study it is aimed to examine psychological status of migraine patients with neuroticism, anxiety, depression, extraversion and ego resilience dimensions.

**Methods:** The participants of the study were included 58 chronic migraine patients and 45 healthy people. The psychological status of participants was examined with Hospital Anxiety and Depression Scale, Eysenck Personality Questionnaire-Revised, Ego Resilience Scale and Migraine Disability Assessment Test.

**Results:** Migraine patients had higher scores in depression, anxiety and neuroticism scores. There was a significant correlation between ego resilience and depression and anxiety among migraine patients. However, this correlation did not reach significant level among healthy group. Ego resilience could be a protective factor against depression and anxiety among migraine patients. Employment status would be another critical factor. Migraine patients whom employed ones had lower depression and anxiety scores.

**Conclusion:** This study indicates that ones who had higher levels of ego resilience show lower levels of depression and anxiety among migraine patients. Moreover, the employed migraine patients also have low levels of depression and anxiety problems.

**KEYWORDS:** *Anxiety, chronic migraine, depression, ego resiliency, neuroticism*

## OP17

### Grey Zones in Trigeminal Autonomic Cephalalgias

Nevra Öksüz, Aynur Özge,

Department of Neurology, Mersin University School of Medicine, Mersin, Turkey

**Address for correspondence:** Assistant. Prof. Nevra Öksüz,  
Department of Neurology, Mersin University School of Medicine, Mersin, Turkey.  
E-mail: nvrksz@gmail.com

**Background:** The trigeminal autonomic cephalalgias (TACs) are a group of primary headache disorders characterized by unilateral trigeminal distribution pain and prominent ipsilateral cranial autonomic features. Although the diagnostic criteria of TACs are clear, gray zones are frequently encountered in our clinical practice.

**Aim:** TACs are unique primary headache syndromes with lateralization of symptoms and signs and specific responses to treatment. However, it may be difficult to distinguish between migraine and TACs in some cases with subtle autonomic features and in patients with fewer attacks. Migraineous features may accompany TACs in some cases.

**Methods:** For this purpose, 82 TACs patients (66 CH, 7 PH, 4 SUNCT and 3 HC) who applied to our clinic between 2017-2021 were examined. Features such as pulsating quality, aggravation by physical activity, nausea/vomiting, photophobia and phonophobia, which are included in the typical migraine diagnostic criteria and supportive features such as motion sickness, exacerbation during menstrual period, sleep disorders, dizziness, family history of migraine, atopy and allergy were questioned.

**Results:** Most of the patients (n=44, %53.6) had a throbbing headache. 10 patients had both nausea and vomiting (%12.1), 25 patients had both photophobia and phonophobia (%29.2), 29 patients had aggravation by physical activity (%35.3), 10 patients had motion sickness (%12.1), 12 patients had atopy and/or allergy (%14.6) and 14 patients had family history of migraine (%17.0).

**Conclusion:** As well as the findings of TACs reflecting hypothalamic involvement, an approach that includes brainstem and cortical involvement will guide the correct diagnosis and effective treatment.



**KEYWORDS:** *Migraineous features, trigeminal autonomic cephalalgias*

## OP18

# Headache Characteristics of COVID-19 Patients, Investigation of its Relationship with Inflammatory and Respiratory Parameters

Ünlübaşı, Yonca, DüNDAR, Dilcan Kotan, Alemdar Murat, Uludüz Derya<sup>1</sup>

Department of Neurology, Sakarya University Education and Research Hospital, Sakarya, <sup>1</sup>Department of Neurology and Algology, Cerrahpaşa Medical Faculty, Istanbul University, Istanbul, Turkey

**Address for correspondence:** Dr. Ünlübaşı

Department of Neurology, Sakarya University Education and Research Hospital, Sakarya, Turkey.

E-mail: unlubas.yonca@gmail.com

**Background:** COVID-19 is a disease accompanied by many neurological findings, the most common being headache.

**Aim:** We aimed to investigate the clinical features of newly detected headache, its relationship with respiratory and inflammatory parameters. In addition headache attributed to COVID-19 with the clinical outcome of the disease in cases hospitalized due to COVID-19.

**Method:** 196 patients with a diagnosis of COVID-19 were included in the study between April 6, July 10, 2020.

**Results:** The mean age of the patients was 52.04 years and 60.7% were male. COVID-19 related headache was observed in 43.3% of the patients. Anosmia (56.5%), dysgeusia (50.6%), GI symptoms (44.7%) in patients with headache was found to be higher. While headache was positively correlated with CRP, lactate, CAR, ELR and MLR values. Headache associated with COVID-19 was bilateral in 68.2%, localized in the forehead in 41.2%, throbbing in 36.5%, and sensitive to NSAIDs. Linear correlation was found between CRP, ferritin, CAR, MLR and headache intensity, which are thought to be closely related to poor outcome.

**Conclusion:** Our results indicated the male gender, high headache intensity, low body temperature and high CRP, ferritin, CAR, MLR in addition lymphopenia associated with poor outcome of headache deal with COVID-19.

**KEYWORDS:** *Biomarkers, COVID-19, headache*

## OP19

# Self-Reported Pain Intensity Correlates with Disease Duration

Aslıhan Taskiran-Sag

Department of Neurology, School of Medicine, TOBB Economy and Technology University, Ankara, Turkey

**Address for correspondence:** Assistant. Prof. Aslıhan Taskiran

Department of Neurology, School of Medicine, TOBB Economy and Technology University, Ankara, Turkey

E-mail: aslihan.taskiran@gmail.com

**Introduction:** Self-report pain scales are gold standard in pain management. Here, the author aimed to investigate possible clinical factors that may influence the perception of pain intensity.

**Methods:** The patients with neuropathic pain and chronic headache were included (N=64). Visual-analogue scale (VAS) was performed by all and Pain-Detect questionnaire (PD-Q) by the neuropathic pain group. Demographic and clinical features were noted. Statistical analyses were done by SPSS v.20.

**Results:** In the preliminary analysis, two self-report pain scales that were used in neuropathic patients seemed to correlate well with each other ( $r=0.8$ ;  $p<0.001$ ). Self-reported pain intensity by VAS was in correlation with the duration of the painful state ( $r=0.67$ ;  $p=0.009$ ). Age was the strongest correlate of increased pain intensity in painful neuropathic patients as assessed both by VAS ( $r=0.70$ ;  $p=0.006$ ) and PD-Q ( $r=0.62$ ;  $p=0.02$ ). Fifty seven percent of the neuropathic patients were diabetic, however, the duration of diabetes did not show any association with the reported perception of pain. In the migraineurs, VAS showed a moderate correlation with disease duration, similarly

( $r=0.53$ ;  $p=0.05$ ). Yet, age was not a correlate of pain intensity. The level of education, frequency or duration of attacks had no significant effect on reported pain intensity.

**Conclusion:** The longer the patients suffer from pain over years, the more intense they experience and report it. This finding highlights the importance of the reappraisal-affective component of pain in chronic painful states, which should be managed more effectively.

## OP20

### Role of Platelets In Episodic Migraine

Rahşan Karacı, Buse Çağla Artı<sup>1</sup>, Büşranur Oğuz, Gözde Türedi, Füsün Mayda Domaç

Department of Neurology, University of Health Sciences, Erenköy Pyschiatry and Neurology Training and Research Hospital,

<sup>1</sup>Department of Neurology, Medical Faculty, Bahçeşehir University, İstanbul, Turkey

**Address for correspondence:** Dr. Rahşan Karacı

Department of Neurology, University of Health Sciences, Erenköy Pyschiatry and Neurology Training and Research Hospital, İstanbul, Turkey.

E-mail: rahsanoz@gmail.com

**Background:** Platelets play important roles in immune and inflammatory processes. The potential relationship between migraine and platelet biology has been investigated previously and platelet activation has been linked to the pathophysiology of migraine. We aimed to investigate whether the platelet count (PLT), width (PDW) and volume (MPV) values of the patients with episodic migraine differ from the healthy controls.

**Materials and Methods:** Patients diagnosed as migraine according to the International Classification of Headache Disorders-3 criteria were examined retrospectively. Patients with a history of any disease or treatment that can effect platelets, other types of headache, cardiopulmonary or cerebrovascular diseases were excluded. We have compared PLT, PDW and MPV values between healthy controls and patients with episodic migraine.

**Results:** One hundred and seventynine patients with episodic migraine and 59 healthy controls were included. The mean age was  $35.57 \pm 11.14$  years in the patient group and  $28.13 \pm 10.65$  in the control group. The mean value of PLT was  $268.67 \pm 61.57$ , MPV was  $9.82 \pm 1.2$  and PDW was  $19.19 \pm 9.29$  in migraineurs. In the control group mean PLT was  $265.96 \pm 70.70$ , MPV was  $9.45 \pm 1.02$  and PDW was  $16.26 \pm 3.51$ . There was statistically difference between the groups according to PDW ( $p=0.025$ ). Though the PLT and MPV values were also higher than the control group no statistically difference was found ( $p=0.798$  and  $p=0.053$  respectively).

**Conclusion:** Larger platelets contain more dense granules and are more metabolically active than small platelets. In our study, platelet width was found to be larger in migraineurs. We suppose that platelets, especially the size, may have a role in the migraine pathology.

## OP21

### Greater Occipital Nerve Blockade for Treatment of Episodic Cluster Headache

Şenay Yıldız Çelik, Zeynep Aydın<sup>1</sup>

Department of Neurology, Beykoz State Hospital, <sup>1</sup>Department of Medical Services and Techniques, Electroneurophysiology, Beykent University, İstanbul, Turkey

**Address for correspondence:** Dr. Şenay Yıldız Çelik

Department of Neurology, Beykoz State Hospital, İstanbul, Turkey

E-mail: drsenayy@gmail.com

**Background:** Cluster headache (CH) is a primary headache with significant burden and problems in pain control. Greater occipital nerve blockade (GONB) is among the promising procedures for the treatment of severe cases.

**Aim:** We aimed to investigate the effectiveness of GONB in patients with episodic CH (eCH).

**Methods:** Four cases, diagnosed with eCH according to IHCD-3 criteria, who had previous experiences with partial ineffectiveness of sumatriptan and oxygen treatment. The patients were treated with GONB using either 2-5ml lidocaine or lidocaine with 2-mg betamethasone. The recurrence of pain was noted.

**Results:** Case 1; 29-year-old male was admitted on the tenth day of the episode. The patient was pain-free within one day after the injection during 2.5 months of follow-up. Case 2; 35-year-old male was evaluated in the second week of the episode. The second injection was performed since the pain persisted despite a decrease in frequency and severity. The patient was pain-free within the 3 days after the second injection and pain-free for 3 months.

Case 3; 35-year-old female was admitted on the second day. The pain resolved in 1 hour following GONB and pain-free for 4.5 months. Case 4; 48-year-old male was seen in the first week of the episode. This patient was treated with the addition of steroid and on the 10th day, frequency and severity of pain decreased significantly, and after the 20th day, he was pain-free for 1.5 years.

**Conclusion:** GONB was effective in pain control in all of our patients. GONB is a safe, easy to perform, and largely well-tolerated procedure that can rapidly suppress eCH.

## OP22

### Effects of Connective Tissue Manipulation on Pain, Life and Sleep Quality in women with Migraine

Yağmur Karaman, Tuba Can Akman<sup>1</sup>

Department of Physical Therapy and Rehabilitation, Istanbul Medipol University, Faculty of Medicine, <sup>1</sup>Department of Physical Therapy and Rehabilitation, Pamukkale University, Denizli, Turkey

**Address for correspondence:** Yağmur Karaman MSc PT

Department of Physical Therapy and Rehabilitation, Istanbul Medipol University, Faculty of Medicine, İstanbul, Türkiye.

E-mail: ykaraman@medipol.edu.tr

**Background:** Migraine symptoms affect the life and sleep quality. Connective tissue manipulation is an alternative treatment for migraine patients.

**Aim:** This study was planned to examine the effect of Connective Tissue Manipulation (CTM) on pain, life and sleep quality in women with migraine.

**Methods:** Thirty women with migraine between the ages of 18-40 were randomly divided into two groups. Connective tissue manipulation was applied to 15 patients in the treatment group for 4 weeks, 5 days a week. The control group did not receive any treatment. Visual Analogue Scale (VAS), Migraine Disability Assessment Scale (MIDAS), Headache Impact Test (HIT-6), 24-Hour Quality of Life Scale and Pittsburgh Sleep Quality Index (PSQI) for headache severity, disability, quality of life and sleep affect were used respectively.

**Results:** MIDAS, PUKI, VAS and HIT-6 scores decreased with CTM ( $p<0.05$ ), while quality of life scores increased ( $p<0.05$ ) were found. On the contrary, MIDAS, PUKI, VAS and HIT-6 scores were determined increased and quality of life values decreased in the control group. While no difference was found between the MIDAS, PUKI, VAS and HIT-6 scores between the two groups before the treatment, there was a statistical difference after the treatment ( $p<0.05$ ).

**Conclusion:** As a result of this study, CTM applied to women with migraine decreased the severity of headaches and increased their quality of life and sleep. Therefore, CTM application can be among the migraine treatment methods and can be used as a non-pharmacological approach.

**KEYWORDS:** *Connective tissue manipulation, migraine, pain, quality of life, sleep quality*

## OP23

### Is COVID Infection a Triggering Factor for Migraine?

Yalçın Hacıoğlu, Ufuk Emre<sup>1</sup>

Department of Family Medicine, Istanbul Training and Research Hospital, <sup>1</sup>Department of Neurology, Istanbul Training and Research Hospital, Istanbul, Turkey

**Address for correspondence:** Dr. Yalçın Hacıoğlu

Department of Family Medicine, Istanbul Training and Research Hospital, Istanbul, Turkey.

E-mail: yalcin18@yahoo.com

**Objective:** Primary headaches are known to exist in patients with Covid-19 disease. In this research, we investigate the presence of migraine, the characteristics among COVID-19 patients in Turkey.

**Methods:** To describe the clinical features of headache in COVID-19 positive individuals during pandemic. Patients with COVID-19 positive are seen face-to-face in this private polyclinic, and work permits and final exams are obtained after diagnosis.

**Results:** Headache was detected in 117 of patients with COVID-19. 62 of 117 (52.9%) had new type of headache. The most common triggering factor was stress and fatigue with 59% (n:69), while the second was having COVID-19 infection (32.4%, n:38). Two findings stood out in the group with new headaches. 12 individuals experienced mild to severe throbbing headaches in the temporal area (back of the ear), which did not fulfil diagnostic criteria but was a frequent characteristic across patients. The second finding was that photosensitivity and nausea were the most prevalent symptoms associated with headache in both individuals with established headache diagnosis and those with new onset headache. 16.2 percent (n:19) of individuals with new headaches had migraine. Twelve of these individuals had a first-degree migraine diagnosis. The most common diagnosis of new headache in Covid-19 patients was migraine ( $p<0.05$ ).

**Conclusion:** The frequent observation of COVID-19 infection, especially newly diagnosed migraine in patients with a family history of migraine, and the frequency of photosensitivity in the symptoms of headache patients suggested a common pathophysiological mechanism between COVID-19 and migraine.

## OP24

### The Relationship between Mastalgia and Radiological and Psychosocial Variables

S. Aladağ Kurt, E. Bulu<sup>1</sup>, C. Aksoy Poyraz<sup>1</sup>, İ Hacısalihoğlu Aydın<sup>1</sup>, M. Velidedeoğlu<sup>2</sup>, Y. Kayadibi

Department of Radiology, Cerrahpaşa Faculty of Medicine, Istanbul University, <sup>1</sup>Department of Psychiatry, Cerrahpaşa Faculty of Medicine, Istanbul University, <sup>2</sup>Department of General Surgery, Istanbul University, Cerrahpaşa Faculty of Medicine, Istanbul, Turkey

**Address for correspondence:** Dr. İrem Hacısalihoğlu Aydın

Department of Psychiatry, Cerrahpaşa Faculty Of Medicine, Istanbul University, Istanbul, Turkey.

E-mail: iremhacisalihoglu@istanbul.edu.tr

**Background:** Breast pain called mastalgia is one the most common breast complaints among women of reproductive age. Etiology is consist of anatomical-structural, hormonal, and psychological causes. We would like to present the preliminary results of the study aimed to investigate the association of mastalgia with radiological-clinical findings and psychological wellbeing.

**Methods:** A total of 58 women who applied to Istanbul University-Cerrahpasa, Cerrahpasa School of Medicine, Department of Radiology due to breast pain were included in the study. Participants were asked about their social-demographical information and whether having palpable mass and cyclic pain. Also, subjects were evaluated their symptoms with visual analogue scale (VAS), Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI). In addition, mammographic and sonographic findings were collected and associated with clinical variables.

**Results:** The mean age of participants was  $46.3 \pm 1.7$ , and the median of VAS scores was  $5 \pm 1.7$ . The mean scores of BD and BA were  $13.1 \pm 8.1$  and  $15.8 \pm 10.9$ , respectively. Whereas 30 women reported presenting with the complaint of a palpable mass in their breast, only 10 had a mass detected by radiological imaging. Women having palpable mass had significantly higher scores in BD ( $p<0.001$ ), BA ( $p=0.015$ ), and VAS ( $p=0.018$ ). Also, VAS scores were significantly correlated with BD scores positively ( $p=0.034$ ,  $CC=0.28$ ).

**Conclusion:** The present study have reemphasized the bidirectional relationship between pain and depression in patients with mastalgia. Even if clinicians couldn't find any evidence with radiological methods, they should consider patients' self-reported complaints about their psychological wellbeing.

## OP25

### Efficacy of Dexamethasone Treatment in Status Migrainosus

Berkan Kaplan

Department of Neurology, Istanbul Medipol University, İstanbul, Turkey

**Address for correspondence:** Asst. Prof. Berkan Kaplan  
Department of Neurology, Istanbul Medipol University, İstanbul, Turkey.  
E-mail: kaplanberkan@yahoo.com

Migraine is a primary headache that is common in the community and is one of the most common causes of disability in young adults. In addition to its high incidence in studies, it causes a high socio-economic burden. Although there are different medical and complementary treatment options for migraine attack treatment, different complications can be observed due to reasons such as inadequate or delayed treatment. Status migrainosus is one of the most important complication. Status migrainosus is defined as a debilitating migraine attack with pain similar to a previous migraine attack but lasting longer than 72 hours. There are different treatment options available in the treatment of migraine status. In this study, the efficacy of dexamethasone alone and some treatment combinations on the termination of migraine status was investigated.

**Materials and Methods:** 32 patients who applied to the neurology outpatient clinic of Istanbul Medipol University Çamlica Hospital between July 2019 and August 2021 and were diagnosed with migraine status according to ICH-3 criteria were included in the study retrospectively. The choice of treatment was made in line with the severity of pain and additional complaints of the patients.

**Results:** In the treatment, only metoclopramide, only dexamethasone, dexamethasone and metoclopramide, and recurrent dexamethasone and diazepam treatment were used in resistant cases.

**Discussion:** Dexamethasone is an effective treatment choice in the treatment of migraine status. Additional symptoms and accompanying diseases of the patient are important in the selection of treatment.

## OP26

### Idiopathic Intracranial Hypertension Cases with Uncommon Presentations

*Semih Taşdelen, Çağrı Ulukan, Elif Kocasoy Orhan*

Department of Neurology, Istanbul Faculty of Medicine, Istanbul University, Istanbul, Turkey

**Address for correspondence:** Dr. Semih Taşdelen  
Department of Neurology, Istanbul Faculty of Medicine, Istanbul University, Istanbul, Turkey.  
E-mail: drsemitasdelen@gmail.com

**Background:** Idiopathic intracranial hypertension (IIH) is a condition in which increased intracranial pressure is detected without a structural lesion in the brain and abnormal finding in cerebrospinal fluid (CSF). The main complaints are headache, transient vision loss, diplopia, tinnitus, and the main findings are papilledema, visual loss, and visual field defect, and abducens paralysis. In this abstract, we report 2 cases with unusual presenting symptoms.

**Cases:** Case 1: A 51-year-old female patient, referred from otorhinolaryngology for persistent rhinorrhea after several patch operations for 2 years. The patient rarely had mild headache and tinnitus. Papilledema was not detected, and the visual field of the right eye was minimally narrowed. Cranial MRI was within normal limits, except for empty sella. CSF pressure was 27 cmH<sub>2</sub>O. Acetalsamide treatment was started. On 6<sup>th</sup> month follow-up, headache and tinnitus were diminished, and the visual field was normal.

**Case 2:** A 42-year-old female patient with a history of surgery for cervical hernia was referred with postoperative headache. CSF pressure was 5 cmH<sub>2</sub>O, and epidural blood patch was applied twice. After the second procedure, her headache, unlike the previous headache, worsened when lying down. Visual impairment and rhinorrhea were added. Neurological examination, except mild bilateral visual field deficits, was normal. Cranial MRI showed bilateral optic nerve tortuosity and empty sella. After acetalsamide and topiramate treatments her headache decreased and the visual field improved.

**Conclusion:** Contrary to common complaints of IIH the main complaint of our cases was rhinorrhea. They were unusual, primarily not suggestive of IIH. Therefore, we report these cases to discuss the role of rhinorrhea in the diagnosis of IIH.

## OP27

### Clinical Findings of Patients in a Headache Out-Patient Clinic

*Güneş Altıokka-Uzun*



Department of Neurology, Faculty of Medicine, Trakya University, Edirne, Turkey

**Address for correspondence:** Dr. Güneş Altıokka-Uzun

Department of Neurology, Faculty of Medicine, Trakya University, Edirne, Turkey.

E-mail: mavilapina@gmail.com

**Background:** Headache is one of the most common and disabling neurological symptom. Although most patients are evaluated by neurologists, rate of referrals to tertiary neurological centers for headache has been increased.

**Aim:** The purpose of this study is to identify the clinical findings of the patients who were referred to a specialized headache outpatient clinic between the years 2018-2019.

**Results:** One hundred one patients (78 (77.2%) Female), with a mean age of was  $41.9 \pm 12.8$  years were evaluated retrospectively. Headache was the main complaint except in 12 patients who described primarily visual complaints. All patients had at least one neuroimaging but 32 of them did not have any systemic and blood examinations before referral. Migraine without aura (26.7%) and medication overuse headache (24.7%) were the most commonly diagnosed headache disorders. Neurological examinations were normal except in 10 patients with papilledema who diagnosed as idiopathic intracranial hypertension. 7.9 % of the patients were diagnosed with secondary headaches such as cerebral aneurysm, glaucoma, obstructive sleep apnea, hypertension and severe anemia. Fifty-nine (58.4%) of the cases were under at least one prophylactic treatment and it was observed that 40.6 % of the patients under treatment were diagnosed as migraine. Only 39 (38.7%) patients were evaluated by neurologists and referred to tertiary center because of the treatment resistance. The main reason for referrals was visual complaints in addition to headache in the remaining patients seen by other healthcare professionals with different specialities.

**Conclusion:** The diagnosis and treatment of headache is still complicated for all physicians. Our findings show that more than one third of the patients admitted with headache to tertiary centers are those referred by specialists in neurology. Increased knowledge in headache medicine seems to be required in neurologists as well as in all areas of specialities

**KEYWORDS:** Headache specialized outpatient clinic, headache, migraine, referral

## OP28

# Neutrophil-to-lymphocyte Ratio in Migraine Patients Treated with Greater Occipital Nerve Blockade

Burcu Polat, Sevil Sadri<sup>1</sup>

Department of Neurology, School of Medicine, Istanbul Medipol University, <sup>1</sup>Department of Hematology, School of Medicine, Istanbul Medipol University, İstanbul, Turkey

**Address for correspondence:** Assist. Prof. Burcu Polat,

Department of Neurology, School of Medicine, Istanbul Medipol University, İstanbul, Turkey.

E-mail: burcupolat@medipol.edu.tr

**Background:** Neuroinflammation is an important mechanism in various neurological disorders, and also in migraine. The discovery of the neuroinflammation's critical role in migraine give new insights into the cause of the disease.

**Aim:** "Neutrophil-to-lymphocyte ratio" (NLR) is simple, obtainable, and inexpensive inflammatory response markers and is easily quantified by a complete blood count and serum evaluation. An increased NLR may reflect inflammation.

**Methods:** Total of 24 migraine patients and 24 age- and sex-matched healthy control subjects were included in the study. NLR and other hematological parameters were recorded before and after GON block (15 days prior to intervention and 15 days after the intervention).

**Results:** In our study, 16.7% (n=8) of the participants were male and 83.3%(n=40) were female. The median age was 56 (18–61) in migraine patients. Migraine disease duration was between 1 and 40 years, with a mean of  $14.13 \pm 8.59$ . Although the post-treatment NLR and other values did not show a statistically significant difference compared to the pre-treatment, the post-treatment rates were found to be lower ( $p > 0.05$ ).

**Conclusion:** Systemic inflammation in patients with migraine may be associated with the presence of a continuous inflammatory process, even in periods of absence of attacks. In our study, although the NLR values were not statistically significant, the values were found to be higher before the treatment, but we did not detect a significant

difference due to the small number of patients. More comprehensive and controlled studies are needed to evaluate of the NLR and other hematological values in migraine.

**KEYWORDS:** *Lymphocyte, migraine, neuroinflammation, neutrophil, NLR*

## OP29

# Prevalence and Self-Management of Migraine among Neurologist and Neurology Residents in Turkey

Nesrin Ergin, Mustafa Ertaş<sup>1</sup>

Department of Neurology, Medical Faculty, Pamukkale University, Denizli, <sup>1</sup>Department of Neurology (Emeritus), Medical Faculty, Istanbul University, Istanbul, Turkey

**Address for correspondence:** Assistant. Prof. Nesrin Ergin,  
Department of Neurology, Medical Faculty, Pamukkale University, Kınıklı, Denizli, Turkey.  
E-mail: nergin2099@gmail.com

**Background:** This study aimed to determine the migraine prevalence and self-management of Neurology specialists and residents registered with the Turkish Neurological Society.

**Methods:** This cross-sectional study includes 851 participants. Based upon the “The International Classification of Headache Disorders, 3<sup>rd</sup> edition” and previous literature, an anonymous questionnaire was prepared and used to collect data online via Google Forms. The link of the study was posted on the website of the Society.

**Results:** The mean age (SD) is 39.7 (10.5) years. Women (73.2%) and specialist (77.4%) made up the majority. Of the participants, 37.9% met the diagnosis criteria for migraine. Comparing with the tension type headache (TTH) sufferers, migraine significantly hinders the work, social and family life (all p values <0.001). Participants with migraine had more MRI (47.4%), CT (7.1%), and EEG (4.3%) than those with TTH (all p values <0.05). Participants with migraine receive drug prophylaxis more frequently (20.1%) than those with TTH (p <0.001), and these drugs are SSRI (7.1%), Beta-blocker (5.9%), SNRI (5.3%), and tricyclic (2.2%) (overall p <0.05). Participants with migraine receive non-drug prophylaxis for headache more frequently (25.7%) compared to those with TTH (p <0.001), and these are mainly migraine botox (8.4%), GON block (4.6%), and acupuncture (4.6%), (all p <0.05).

**Discussion:** Migraine is more common among Neurologists and residents than in the general population. Identifying of migraine self-management of neurologists are important in terms of preventing the loss of work and negative economic and social consequences that migraine may cause in this group of physicians.

**KEYWORDS:** *Headache, migraine, neurologist, prevalence, self-management*

## OP30

# Effect of COVID infection on Childhood Migraine

R. Gokcen Gozubatik-Celik, Ayten Ceyhan Dirican

Department of Neurology, Bakirkoy Research and Training Hospital for Neurologic and Psychiatric Diseases, University of Health Science, Istanbul, Turkey

**Address for correspondence:** Assoc. Prof. Rabia Gökçen Gözübatık Çelik,  
Department of Neurology, Bakirkoy Research and Training Hospital for Neurologic and Psychiatric Diseases, University of Health Science, Istanbul, Turkey.

E-mail: gokcen3@hotmail.com

**Introduction:** In our country, the prevalence of migraine in children ranges from 10 to 17 percent. The purpose of this study was to look into the impact of COVID-19 infection on migraine clinics in children and adolescents.

**Methods:** The study included 40 participants classified as having migraine using the International Classification of Headache Criteria (ICHD-III). Multiple measures including the Screen for Child Anxiety-Related Disorders (SCARED), the Pediatric Quality of Life Inventory (PedsQL), and Visual Analogue Scale (VAS) were administered to each participant on a voluntary basis for the establishment of the diagnosis. Children diagnosed by COVID-19 on a PCR test (Group 1)

were compared with children not infected in terms of frequency and severity of migraines (Group 2).

**Results:** The patients' average age was  $12.0 \pm 4.5$  (min-max: 8-16 years) years and the mean disease duration of patients was  $3.7 \pm 1.2$  years. 21 of the patients experienced the presence of migraine in the family. The demographic features of Group 1 and Group 2 were similar ( $p > 0.05$ ). COVID-19 infection was found in 24 of 40 patients (Group 1). In 18 of them, the severity and frequency of their monthly headaches worsened. Five patients in Group 2 ( $n: 16$ ) had the same reports ( $p < 0.001$ ). Both groups have similar Screen for Child Anxiety-Related Disorders (SCARED) scores ( $p > 0.05$ ). However, Mean SCARED score was  $34.0 \pm 7.3$  in Group I,  $19.0 \pm 3.81$  in Group II ( $p < 0.05$ ).

**Conclusion:** These findings suggested that COVID-19 infection can be triggering factor for migraine prognosis and it has a negative impact on quality of life in childhood ages.

## OP31

### Vascular Comorbidities are More Prominent in Chronic Migraine Rather Than Episodic Migraine

Emel Ur Özçelik, Ezgi Uludüz<sup>1</sup>, Aynur Özge<sup>2</sup>, Mustafa İskender<sup>3</sup>, Derya Uludüz<sup>4</sup>

Department of Ergotherapie, Istanbul Health and Technology University, İstanbul, Turkey, <sup>1</sup>Gazi University Faculty of Medicine, Medical Student, Ankara, <sup>2</sup>Department of Neurology, Mersin University School of Medicine, Mersin, <sup>3</sup>Private Practice, Kocaeli, Turkey, <sup>4</sup>Department of Neurology, Istanbul University, Cerrahpaşa School of Medicine, İstanbul, Turkey

**Address for correspondence:** Dr. Emel Ur Özçelik

Department of Ergotherapie, Istanbul Health and Technology University, İstanbul, Turkey  
E-mail: emeluscas@yahoo.com

**Background/Aim:** Chronic migraine (CM) is a disabling neurologic condition that seriously reduces patients' quality of life due to frequent headaches. Several factors are shown to be associated with an increased risk of transforming to CM. We aimed to analyze the attack triggers and comorbidities associated with CM focusing vascular comorbidities.

**Methods:** Patients followed up with the diagnosis of definite migraine for at least one year were divided into two groups: i) Episodic migraine (EM) (<15 attacks per month) ii) CM (>15 attacks per month). The demographical and clinical data, attack triggering factors, comorbid diseases were compared between groups.

**Results:** The data of 275 (209F) patients with migraine was analyzed; 136 (49.5%) of the migraineurs had EM and 139 (50.5%) of them had CM. Mean age was  $40.6 \pm 11.0$  years in EM, whereas  $42.2 \pm 12.3$  years in CM. Mean attack trigger number was  $8.42 \pm 3.6$  in EM, whereas  $8.68 \pm 4.1$  in CM. Medication overuse (EM: 52.9%, CM: 83.5%), hypertension (EM: 7.4%, CM: 17.5%), depression (EM: 17.6%, CM: 33.6%), hypercholesterolemia (EM: 8.1%, CM: 17.5%), existence of additional health problems (EM: 43.4%, CM: 59.1%) were significantly higher in CM ( $p < 0.05$ ). Stress (EM: 89%, CM: 90.6%) and lack of sleep (EM: 76.5%, CM: 76.1%), climate changes (EM: 66.2%, CM: 55.1%), and missing meals (EM: 59.6%, CM: 69.6%) were the most frequent triggers in both groups.

**Discussion:** Medication overuse, depression, existence of additional health problems and vascular comorbidities such as hypertension and hypercholesterolemia were found to be associated with CM. Thus, identifying the factors that may play a role in chronicity of migraine seems crucial both for elucidating the pathophysiology of CM and developing preventive treatments.

## OP32

### The Relationship between Headache and Body Mass Index in Idiopathic Intracranial Hypertension

Hacı Ali Erdoğan, Hülya Ertaşoğlu Toydemir, İbrahim Acır, Vildan Yayla

Bakırköy Dr. Sadi Konuk Research and Training Hospital, İstanbul, Turkey

**Address for correspondence:** Dr. Hacı Ali Erdoğan

Bakırköy Dr. Sadi Konuk Research and Training Hospital, İstanbul, Turkey  
E-mail: drhaciali@gmail.com

**Background:** Idiopathic intracranial hypertension (IIH) is a syndrome of increased intracranial pressure of unknown etiology. It is more frequent in obese women of childbearing age and the exact mechanism of IIH is unknown. Most

patients have high body mass index (BMI). Headache, pulsatile tinnitus, transient visual obscurations and diplopia are common symptoms among IIH patients.

**Aim:** We aimed to evaluate clinical findings and demographic features of the patients and to assess the relationship between headache and BMI.

**Methods:** Thirty-one IIH patients were included the study. Demographic data, clinical, radiological findings and also BMI of the patients were recorded. Visual analogue scale (VAS) which is a validated instrument for evaluation of pain was used to evaluate the severity of headache. The relationship of VAS and BMI was investigated.

**Results:** All patients were female and mean age was  $35.5 \pm 2.1$  years. Mean value of BMI was  $31.8 \pm 1.0$  kg/m<sup>2</sup> and mean value of VAS was  $7.9 \pm 0.5$ . Patients were divided in two groups according to their BMI values. Twenty-five patients with BMI < 35 were in Group I and six patients with BMI  $\geq 35$  were in Group II. There wasn't any significant relationship between VAS and BMI ( $p=0.465$ ).

**Conclusion:** Headache is a disabling symptom in IIH patients as shown by high VAS score in our study. Although any significant correlation between BMI and headache was not found, all of our patients were obese, weight loss was strongly recommended for IIH. Treatment of severe headache besides management of the other symptoms is important for quality of life.

**KEYWORDS:** *Body mass index, headache, idiopathic intracranial hypertension*

## OP33

### Could Patients with Allodynia Have White Matter Lesions in the Brain stem?

*Tuğba Eyigülbüz, Zerrin Yıldırım, Nilüfer Kale İçen*

Sağlık Bilimleri Üniversitesi Bağcılar Eğitim ve Araştırma Hastanesi, İstanbul, Turkey

**Address for correspondence:** Dr. Zerrin Yıldırım

Bagcilar Training and Research Hospital, Department of Neurology, İstanbul, Turkey.

E-mail: yildirimzerrin@gmail.com

**Aim:** Allodynia is a very uncomfortable condition in patients with primary headaches. The mechanism is unclear. However, trigeminovascular structures in the brain stem are held responsible. In this study, we were to investigate whether there were any evidence of abnormal imaging of white matter lesions or similar pathologies in the imaging of primary headache patients' who described allodynia, especially in the imaging of the brain stem, where the structures thought to be responsible for allodynia were located.

**Methods:** Fifty-eight patients with migraine or tension-type headaches who described allodynia during pain were included in the study. Demographic and clinical characteristics were examined. An allodynia survey of 12 questions was conducted. And cranial magnetic resonance imaging (MRI) was performed and flair sequences were examined in particular.

**Results:** As a result of our study, we observed white matter lesions in only 9 of the 58 patients who described allodynia, all of which were supratentorial and pathological images were not observed in the infratentorial area.

**Conclusion:** These findings may not indicate that the presence of allodynia does not leave permanent damage to the brain stem area. Perhaps if imaging could be performed during allodynia or MRI could be performed with thinner sections, images similar to other white matter lesions reported in the literature could be viewed. Extensive studies are still needed to understand the pathogenesis of Allodynia.

## OP34

### Knee Pain and Basic Body Awareness Therapy Approach: A Case Report

*H. Reyhan Özgöbek, Hamiyet Yüce<sup>1</sup>*

Turkish Physiotherapists Association, <sup>1</sup>Department of Physiotherapy and Rehabilitation, Bandırma University Health Sciences University, Bandırma/Balıkesir, Turkey

**Address for correspondence:** Hatice Reyhan Özgöbek PT  
 Turkish Physiotherapists Association,  
 E-mail: reyhan\_ozgobek@yahoo.com

**Background:** Osteoarthritis (OA) pain has multiple etiologies inside and outside the joint. As a complex phenomenon with a strong subjective component, pain can also be influenced by the nature of the underlying disease, personal predisposition (biological and psychological), environmental and psychosocial factors. The integrative role of biomechanical factors in the development and progression of osteoarthritis, especially in the lower extremities, is widely accepted. Basic Body Awareness Therapy can help psychosocial aspects as well as regulate lower extremity biomechanics and reduce pain.

**Objective:** this case study demonstrates how Basic Body Awareness Therapy (BBAT) can help a patient with knee pain. Knee pain is one of the most difficult pains to cope with. The agents used by physiotherapists for knee pain apply manual therapy approaches (mobilization, manipulation, manual therapy, aquapression, massage, etc.), electrotherapy modalities and exercise programs (calisthenic exercises, strengthening, specialized exercises such as clinical pilates, etc.).

**Case Description:** A 70-year-old female patient complained of knee pain for 14 years. Physiotherapy approaches were recommended before Total Knee Prosthesis due to knee degeneration. Insoles were applied in 2014 due to deterioration in knee biomechanics. Osteopathy applications in 2017, classical physiotherapy and taping in 2019. The patient states that he has been actively walking for 40 minutes a day (between 20 minutes and 1 hour) for 12 years.

**Method:** Basic Body Awareness Therapy exercises started to be implemented in January 2020. She has been doing the BBAT exercise himself every day since June 2021. She does it with a physiotherapist once a week. Exercises including body alignment, perception of stability limits, arm and lower extremity coordination exercises of the BBAT method are practiced by integrating breathing, which is important in body posture.

**Results:** As a result of BBAT exercise application, pain in the knee and feeling of fatigue after walking decreased. She states that he bends his knees more easily, climbs the stairs more easily, and can climb up by holding on while descending the stairs and without holding on while climbing. The patient states that he can do his daily work easily, and his morale improves as she feels better. She states that his social relations have improved (going to the neighbors, preparing food for the grandchildren, going shopping with her husband, etc.). Due to the fact that he carries the body biomechanics she has learned to the activities of his daily life, the feeling of fatigue has decreased because the energy use is less, and the sleep quality has increased with the use of natural breathing and decreased muscle tone. She also stated that there was a decrease in urination time.

**Conclusion:** With this case report, it is thought that BBAT can reduce knee pain with the regulation of body alignment and increase in postural stability in individuals with knee pain. Comprehensive studies on larger numbers of patients are needed.

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## OP35

# The Relationship between CSF Opening Pressure and Clinical Features in Idiopathic Intracranial Hypertension

*İbrahim Acır, Hülya Toydemir, Hacı Ali Erdoğan, Vildan Yayla*

Bakırköy Dr. Sadi Konuk Research and Training Hospital Clinic of Neurology, Istanbul, Turkey

**Address for correspondence:** Dr. İbrahim Acır,  
 Bakırköy Dr. Sadi Konuk Research and Training Hospital Clinic of Neurology, Istanbul, Turkey.  
 E-mail: iacir33@gmail.com

**Background:** Idiopathic intracranial hypertension (IIH) is a syndrome of increased intracranial pressure of unknown etiology. Main features of the syndrome are headache, tinnitus, diplopia and transient visual obscurations. Although the exact mechanism of IIH is not known, decreased CSF absorption, increased CSF production and transverse sinus stenosis are possible etiological causes. Clinical features of increased intracranial pressure and CSF opening pressure greater than 25 cm H<sub>2</sub>O are main diagnostic criteria.

**Aim:** The aim of this study is to evaluate clinical and demographic features of IIH and to investigate relationship between CSF opening pressure and clinical features.



**Methods:** Twenty-eight IIH patients were included in the study. Demographic data, clinical and radiological findings were evaluated. CSF opening pressure of all patients were recorded. The relationship between CSF opening pressure and clinical findings were investigated.

**Results:** All patients were female and mean age was  $36 \pm 2.2$  years. Mean value of body mass index (BMI) was  $32.2 \pm 1.0$  kg/m<sup>2</sup> and mean value of CSF opening pressure was  $37.7 \pm 2.1$  cmH<sub>2</sub>O. There was relationship between and diplopia ( $p=0.012$ ), but, there wasn't any between CSF opening pressure and the other major IIH signs; headache, tinnitus and transient visual obscurations.

**Conclusion:** Increased CSF opening pressure is one of the main features of IIH. Although diplopia was the least common clinical finding among our patients, significant relationship was found between only CSF opening pressure and diplopia. Clinicians should be alert when diplopia and visual disturbances are detected in IIH patients because this may have impact on the approach to these patients.

**KEYWORDS:** CSF opening pressure, diplopia, Idiopathic intracranial hypertension

## OP36

### Persistent Idiopathic Facial Pain Due to Psychological Trauma: Case Report

Lerze Furkan Yaghouti, Sevda Gümüş Şanlı, Burcu Polat<sup>1</sup>

Department of Psychiatry, Faculty of Medicine, Istanbul Medipol University, <sup>1</sup>Department of Neurology, Faculty of Medicine, Istanbul Medipol University, İstanbul, Turkey

**Address for correspondence:** Dr. Lerze Furkan Yaghouti

Department of Psychiatry, Faculty of Medicine, Istanbul Medipol University, İstanbul, Turkey.

E-mail: lfyaghouti@medipol.edu.tr

**Background:** Persistent idiopathic facial pain (PIFP) is a chronic pain disorder. The underlying mechanisms are poorly understood.

**Aim:** PIFP is a diagnostic problem that confronts us head on. Descriptive terms include dull, poorly defined, non-localized. This case aims to familiarize the clinicians with the clinical presentation and management of PIFP, also indicates the psychogenic aspect of PIFP as well as the value of psychological counseling.

**Case:** A 33 years old male presented with two years history of unilateral face pain and headaches located over the right side. His neurological examination, temporal bone CT and right upper limb EMG were normal. No aneurysm or vascular malformation was observed in digital subtraction cerebral angiography performed based on MRI findings. There were no improvements with any of the interventions including botox, infraorbital nerve blockade, infratemporal fossa type-a surgery and the drugs including carbamazepine, pregabalin and tramadol. The continuous nagging and dull nature of the pain was assessed associated with the PIFP. Psychiatrists revealed that his brother accidentally shot himself with their father's gun in the head area where the patient described the pain. That pain was the somatization of psychological trauma.

**Conclusion:** PIFP needs interdisciplinary collaboration to rule out and manage secondary causes, psychiatric comorbidities and other facial pain syndromes. Burden of disease and psychiatric comorbidity screening is recommended at early stage, and should be addressed in the management plan.

**KEYWORDS:** Atypical facial pain, childhood trauma, persistent idiopathic facial pain, psychological stress

## OP37

### Case Report: Sphenopalatine Ganglion Block in Treatment of Persistent Headache Following the Second Dose of Mrna-Bnt162b2 SARS-COV-2 Vaccine

O. Çibuku, O. Karadaş<sup>1,2</sup>

Department of Neurology, Pogradec Hospital, Albania, <sup>1</sup>Department of Neurology, Gülhane School of Medicine, University of Health Science, <sup>2</sup>Department of Neurology, Gülhane Training and Research Hospital, Ankara, Turkey



**Address for correspondence:** Dr. Oneda Çibuk  
Department of Neurology, Pogradec Hospital, Albania.  
E-mail: onedacibuku@gmail.com

**Introduction:** The SARS-CoV-2 pandemic has led to the development of the first mRNA vaccines applied in humans. The vaccines are well tolerated, safe and highly efficacious. Tension type headache is one the most commonly side effects noticed, rarely refractory headache to NSAID. We report a case of refractory to NSAID headache following administration of the dose of BNT162b2 (Pfizer) SARS-CoV-2 vaccine, resolved after sphenopalatine ganglion block.

**Case Report:** A 37- year old man presented with severe pulsatile fronto-temporal persistent headache 4 days after receiving the second dose of mRNA-BNT162b2 SARV-CoV-2 vaccine. Brain MRI showed no focal lesion or other abnormal findings. She was discharged prescribing NSAID and vitamins supplements. Eight day after vaccination the headache persists and accompanied by nauze and dizziness. A repeated MRI of the head performed with administration of intravenous contrast material resulted normal. Diagnosis of vaccine-associated headache was made given the temporal relationship and clinical features of headache. The patient underwent sphenopalatine ganglion block and was relieved completely after the second application.

**Discussion:** Headache after receiving SARS-CoV-2 vaccine is a common adverse effect. In some cases the refractory to oral NSAID therapies can be challenging. This may be managed successfully with sphenopalatine ganglion block with complete recovery of the symptoms. Further research is warranted to determine the mechanisms by which mRNA vaccines may cause refractory and persistent headache.

**KEYWORDS:** Headache, SARS-CoV-2 vaccine, sphenopalatin ganglion block

## OP38

### Case Report: Great Occipital Nerve Block in Treatment of New Onset and Refractory Headache Associated with COVID-19

Elpenoria K<sup>1</sup>, O. Karadas<sup>1,1,2</sup>

<sup>1</sup>Department of Neurology, Memorial Regional Hospital, <sup>1,1</sup>Department of Neurology, Gülhane School of Medicine, University of Health Science, <sup>2</sup>Department of Neurology, Gülhane Training and Research Hospital, Ankara, Turkey

**Address for correspondence:** Dr. Kjanda Elpenoria  
Department of Neurology, Memorial Regional Hospital, Albania.  
E-mail: kjandaelp@gmail.com

**Introduction:** Headache is one of the most common neurological symptoms of COVID-19, which can occur early in the course of the illness. We report the case of new onset headache associated with COVID-19, refractory to iv paracetamol, which was completely resolved after GON blocks.

**Case Report:** A man 32 years old, at the 5-th day of SARS- CoV- 2 infection, was presented with new onset of severe, bilateral frontal, throbbing headache, worsening with movement and accompanied with nausea, photophobia, phonophobia. The patient had no prior primary headache. The neurological examination was normal. The laboratory findings showed increased IL-6 (56 pg/ml) and D Dimer (8.4mg/mL) levels. Thorax CT imaging showed 72% pulmonary involvement by COVID-19. His brain MRI resulted normal. Diagnosis of new onset headache associated with COVID-19 was made based on clinical features of headache, pulmonary involvement and increased IL-6 levels. He was treated first with iv paracetamol 1000 mg for one week but was unresponsive. His headache persisted every day and the duration of headache attacks was more than 10 hours/ day. Interventional GON block procedures were performed and the patient was completely relieved after the third injection.

**Conclusion:** During the COVID-19 course, bilateral, frontal, throbbing, severe, long duration, and higher frequency headaches are frequently noticed, mostly in patients without prior primary headaches. Repetitive GON blocks seem to be a good choice to abort headache attacks when patients are unresponsive to iv paracetamol.

**KEYWORDS:** COVID-19, great occipital nerve, headache

## OP39

### Trigeminal Ganglion Edema Treated by Oral Corticosteroid

Mustafa Kurçaloğlu

Department of Anesthesiology and Reanimation, Ondokuz Mayıs University, Pain Clinic, Samsun, Turkey

**Address for correspondence:** Assistant. Prof. Mustafa Kurçaloğlu

Department of Anesthesiology and Reanimation, Ondokuz Mayıs University, Pain Clinic, Samsun, Turkey.

E-mail: mkurcal@gmail.com

**Background and Aim:** Trigeminal neuralgia (TN) is a common disease in the population older than 50 years. In this case, we reported the treatment of trigeminal ganglion edema due to Gamma-Knife procedure which was applied a few days after the Gasserian Ganglion Radiofrequency ablation (GGRF).

**Methods:** GGRF procedure was applied to a 65-year-old female patient due to the TN which is resistant to medical treatments and peripheral nerve blocks. Her numerical rating scale (NRS) was 8/10 points. 75 °C 220 seconds RF lesion was applied on the V3 division of the trigeminal ganglion successfully (Figure 1 and 2). One month later, patient applied to the pain clinic suffering a continuous, burning type pain with 10/10 NRS score. Patient reported that she was undergone Gamma-Knife ablation due to her remaining TN pain 10 days after the RF intervention, but her pain type changed, and the intensity of the pain increased tremendously after the Gamma-Knife procedure. Edema in the trigeminal ganglion was considered and oral corticosteroid therapy was started. Fifteen days later patient came to the control visit and she reported that her pain was relieved immediately following the first tablet of the corticosteroid. The patient has no pain on her face for one year.

**Results:** Applying another intervention immediately after the GGRF should be avoided. Oral corticosteroid therapy is considerable option for the treatment of the edema in the trigeminal ganglion.

**KEYWORDS:** Pain, radiofrequency, trigeminal ganglion, trigeminal neuralgia

## OP40

# Do C-reactive Protein/Albumin Ratios Differ According to the Type of Migraine?

Buse Çağla Arı, Rahşan Karacı<sup>1</sup>, Gözde Türedi<sup>1</sup>, Büşranur Oğuz<sup>1</sup>, Füsun Mayda Domaç<sup>1</sup>

Department of Neurology, Medical Faculty, Bahçeşehir University, <sup>1</sup>Department of Neurology, University of Health Sciences, Erenköy Neurology and Psychiatry Training and Research Hospital, İstanbul, Turkey

**Address for correspondence:** Assist. Prof. Buse Çağla Arı,

Department of Neurology, Medical Faculty, Bahçeşehir University, İstanbul, Turkey.

E-mail: juvelia@gmail.com

**Aim:** Cortical spreading depression (CSD) underlies the neurobiology of migraine with aura. CSD activates the trigeminovascular system, evoking a meningeal inflammatory response. Several studies have been conducted on the associations between various inflammatory biomarkers and migraine. In a few studies C reactive protein (CRP) values were found to be higher in patients with migraine with aura (MWA). In our study we aimed to investigate whether CRP/albumin ratios (CAR) of the patients with MWA differ from the patients with migraine without aura (MWOA).

**Methods:** Patients diagnosed as migraine according to the International Classification of Headache Disorders-3 criteria were examined retrospectively. Patients with episodic MWOA and MWA with visual aura were included. Patients with a history of chronic disease, immunodeficiency, acute or chronic inflammatory or infectious diseases, malignities, a history of both MWA and MWOA were excluded. The difference between the groups according to CRP/albumin ratio (CAR) was examined.

**Results:** Forty-two patients with MWA (37 female, 5 male) and 40 patients with episodic MWOA (31 female, 9 male) were included. The mean age of the patients was 39.2±10.5 years in MWOA group and 30.3±9.05 in MWA group. The mean value of CAR was 0.35±0.57 in the MWOA group and 0.43±0.42 in the MWA group. Though CAR was higher in the MWA group than the MWOA group no statistically difference was found between the groups according to CAR (p=0.084). There was no statistically correlation between gender and CAR (p>0.05)

**Conclusion;** The process that initiates cortical spreading depression is not fully known, but it is considered that inflammatory molecules play a role in this process. Though CAR values were higher in MWA group there was

no statistical difference between MWOA. This result may be due to the number of patients in our study. More comprehensive and controlled studies with large number of patients are needed to evaluate the factors associated with MWA.

**KEYWORDS:** *C-reactive protein-albumin ratio, migraine*

## OP41

# Review Due to a Patient we Followed up for Intracranial Hypotension

Halil Güllüoğlu, Hasan Armağan Uysal

Department of Neurology, İzmir University Of Economy, Faculty of Medicine Medicalpark Hospital,

**Address for correspondence:** Assistant. Prof. Hasan Armağan Uysal  
Department of Neurology, İzmir University Of Economy, Faculty of Medicine Medicalpark Hospital,  
E-mail: druyusalarmagan@yahoo.com

**Aim:** Intracranial hypotension is a rare type of headache. It is diagnosed by postural features of headache, cranial MRI findings and cerebrospinal fluid pressure measurement. If not diagnosed and treated early, it can result in subdural hemorrhage and herniation.

**Materials and Methods:** 30-year-old female patient describes a very severe postural headache that occurs after cesarean section, increases when sitting and stands up, and resolves when lying down. It did not improve despite the use of painkillers and fluid consumption. Contrast-enhanced cranial MRI was found to be consistent with diffuse meningeal and tentorium cerebellar enhancement. Lumbar Puncture was performed. 55 mm H<sub>2</sub>O pressure was measured. Epidural blood patch treatment was applied for intracranial hypotension type cephalgia. Intracranial hypotension type cephalgia's most common symptoms are orthostatic headache (92% [95% CI, 87%-96%]), nausea (54% [95% CI, 46%-62%]), and neck pain/stiffness (43% [95% CI, 32%-53%]). Brain magnetic resonance imaging was the most sensitive investigation, with diffuse pachymeningeal enhancement identified in 73% (95% CI, 67%-80%) of patients. Brain magnetic resonance imaging findings were normal in 19% (95% CI, 13%-24%) of patients. Spinal neuroimaging identified extradural cerebrospinal fluid in 48% to 76% of patients. Digital subtraction myelography and magnetic resonance myelography with intrathecal gadolinium had high sensitivity in identifying the exact leak site. Lumbar puncture opening pressures were low, normal (60-200 mm H<sub>2</sub>O), and high in 67% (95% CI, 54%-80%), 32% (95% CI, 20%-44%), and 3% (95% CI, 1%-6%), respectively. Conservative treatment was effective in 28% (95% CI, 18%-37%) of patients and a single epidural blood patch was successful in 64% (95% CI, 56%-72%). Large epidural blood patches (>20 mL) had better success rates than small epidural blood patches (77% [95% CI, 63%-91%] and 66% [95% CI, 55%-77%], respectively).

**Results:** In our patients describing intracranial hypotension type headache, epidural blood patch to be performed after neurological examination, neuroimaging and cerebrospinal fluid examination will prevent possible morbidity and mortality.

## Poster Presentation Abstract

### PA1

## Evaluation of Visual Perception in Migraine

Ahmet Başarı<sup>1</sup>, Hayrunnisa Bolay Belen<sup>2,3,4</sup>, Bülent Cengiz<sup>1,3,4</sup>, Hürrem Evren Boran<sup>1,3,4</sup>, Doğa Vuralı<sup>2,3,4</sup>

Departments of <sup>1</sup>Neurology and <sup>2</sup>Neurology and Algology, Gazi University Faculty of Medicine, <sup>3</sup>Neuropsychiatry Center, Gazi University, Besevler, <sup>4</sup>Neuroscience and Neurotechnology Center of Excellence, Ankara, Turkey

**Address for correspondence:** Dr. Ahmet Başarı

Departments of Neurology, Gazi University Faculty of Medicine, Besevler, Ankara, Turkey.

E-mail: dr.ahmetbasari07@hotmail.com

**Background and Objective:** Various visual complaints are described by migraine patients. Visual temporal discrimination (VTD) is the ability to discriminate and react to the movement, contrast, location and contours of two sequential visual stimuli. We aimed to evaluate the temporal discrimination of visual perception in migraine patients.

**Methodology:** 15 migraine without aura patients and 15 healthy volunteers were included. Migraine patients were examined twice, once during the attack period and once during the interictal period.

**Results:** The mean ictal VTD threshold value of the ipsilateral visual field ( $143.8 \pm 53.8$  ms) was significantly higher than the mean interictal VTD threshold value of the ipsilateral visual field ( $78.0 \pm 19.6$  ms,  $p = 0.025$ ). Ictal VTD threshold values ( $102.3 \pm 38.4$  ms for the right visual field and  $106.3 \pm 52.2$  ms for the left visual field) and interictal VTD threshold values ( $75.2 \pm 27.9$  ms for the right visual field and  $77.2 \pm 27.9$  ms for the left visual field) were significantly higher than the VTD threshold values of the healthy controls ( $45.3 \pm 9.9$  ms for the right visual field and  $48.2 \pm 11.9$  ms for the left visual field,  $p < 0.001$ ,  $p < 0.01$ ,  $p = 0.003$  and  $p < 0.001$  respectively).

**Conclusion:** We showed for the first time that VTD threshold values were higher in migraine patients both during an attack and during the interictal period compared to healthy controls. Additionally ictal VTD threshold values of the ipsilateral visual field were significantly higher compared to the interictal VTD threshold values. According to neuroanatomic pathway of VTD, visual processing involving brain stem, basal ganglia and thalamus seems to be defective in migraine patients.

### PA2

## The Prevalence and Burden of Primary Headache Disorders in Secondary and High School Children

Otgombayar Luvsannorov, Tsengunmaa Anisbayar<sup>1</sup>

Departments of Neurology and <sup>1</sup>Epidemiology and Biostatistics, Mongolian National University of Medical Sciences, Ulaanbaatar, Mongolia

**Address for correspondence:** Dr. Anisbayar Tsengunmaa

Departments of Epidemiology and Biostatistics, Mongolian National University of Medical Sciences, Ulaanbaatar, Mongolia.

E-mail: anistse@yahoo.com

**Background:** Headache is a highly prevalent and burdensome chronic recurrent disease in children and adolescents, with impacts on quality of life, school attendance, social functioning and, predictably, later life.<sup>[1-3]</sup> The prevalence of primary headache in the adult population of Mongolia was estimated (2018) and the 1-year prevalence of migraine is 24.2%, tension headache is 29%, and other chronic headaches are 5%.<sup>[4]</sup>

**Objective:** To determine the prevalence of primary headache in adolescents (12- 17) in Mongolia and to assess some burdens of primary headache.

**Methodology:** We used cross-sectional study design and interviewed total 2046 students aged 12-17 from 7 secondary schools of Ulaanbaatar city and three provinces /Umnugobi, Khuvsgul, Tuv/ representing different geographic regions, from April 2019 to June 2019 for a period of 2 months. Headache-Attributed Restriction, Disability, Social Handicap and Impaired Participation (HARDSHIP) questionnaire for adolescents was used and the diagnoses were made according to the International Classification of Headaches (ICHD-3).<sup>[1,5]</sup> **Results:** The prevalence of primary headache was 58.9% (1193), from which the migraine 34.6% (701), tension-type headache (TTH) 24.3% (492), UdH was 8% (162), other headaches 5.9% (119) and pMOH 0.8% respectively (16). The quality of life of adolescents with primary

headache (22.3) comparatively lower than those who are without headaches (24.0). According to the disability level caused by migraine, 30.9 % showed moderate disability, and 9.3% showed severe disability.

**Conclusion:** Primary headache disorders are common among the adolescents in Mongolia. The 1-year prevalence of primary headache was 58.9% (1193), from which the migraine 34.6% (701), tension-type headache 24.3% and higher than word average. Studies have shown that primary headaches are burden disorders that affect work disability and quality of life. Studies have shown that primary headache disorders impose recognizable burden disorder on sufferers including disability and impaired quality of life.

### PA3

## Migraine Patients Had Lower COVID-19 Phobia and PCL-5 Scores During Lockdown Period

Çile Aktan, Tuğçe Toptan<sup>1</sup>, Çisem Utku<sup>2</sup>, Hayrunnisa Bolay

Department Neurology and Algology, Faculty of Medicine, Gazi University, Ankara, <sup>1</sup>Health Sciences University Trabzon Kanuni Training and Research Hospital, Trabzon, <sup>2</sup>Department of Psychiatry, Gazi University, Ankara, Turkey

**Address for correspondence:** Dr. Çile Aktan

Department Neurology and Algology, Faculty of Medicine, Gazi University, Ankara.

E-mail: drcilezengin@hotmail.com

**Background:** To examine the impact of the lockdown period of the pandemic on COVID-19 phobia and post-traumatic stress disorder in migraine patients.

**Methods:** A total of 73 patients, including 39 migraine and 34 controls, completed the study during the lockdown period. The patients were evaluated by using Structured Headache Questionnaire, PCL-5 and COVID -19 Phobia Scale via the telephone-based telemedicine method.

**Results:** Migraine patients had significantly lower scores in all subgroups of the COVID-19 Phobia Scale (mean =  $42.33 \pm 12.67$ ) than those in the healthy control group (mean =  $52.88 \pm 13.18$ ). PCL-5 scale scores in migraine patients were significantly lower (mean =  $27.18 \pm 14.34$ ) compared to the healthy controls (Mean =  $34.03 \pm 14.36$ ). Migraine attack frequency decreased or did not change in 67% of the patients during the lockdown period.

**Conclusion:** Acute stress response to an extraordinary situation such as a pandemic may be more controlled in migraine patients, yet specific phobia and post-traumatic stress disorder have been reported more frequently in patients with migraine under normal life conditions. We interpreted that the life- long headache associated stress may generate tendency to a resilience and resistance to extraordinary traumatic events in migraine patients.

**KEYWORDS:** COVID-19, migraine, phobia, PTSD

### PA4

## A Case Report of Foster Kennedy Syndrome with A Migraine History

Fidel Demir, Eşref Akıl, Abdullah Acar

Faculty of Medicine, Dicle University, Diyarbakır, Turkey

**Address for correspondence:** Asisstant. Dr. Fidel Demir,

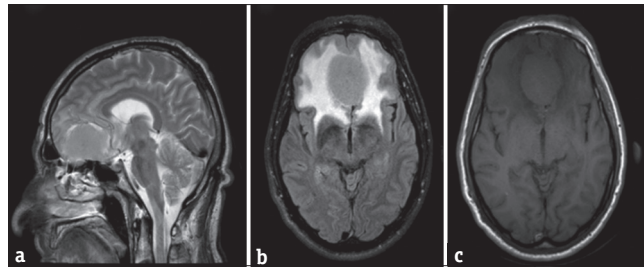
Faculty of Medicine, Dicle University, Diyarbakır, Turkey.

E-mail: fideldemir2605@gmail.com

Foster-Kennedy syndrome is a very rare syndrome characterized by ipsilateral optic atrophy, contralateral papillary edema and anosmia due to the space-occupying mass of the anterior fossa. A 63-year-old male patient, who had frequent migraine attacks for about 2 months, complained of blurred vision and inability to smell for the last month. A giant meningioma was detected in the olfactory groove in cranial magnetic resonas imaging. we aimed to present this case in middle-aged and elderly patients with migrainous headache in terms of being more cautious in terms of secondary causes.

**Case Report:** A 63-year-old male patient with a history of migraine had an increase in the frequency of migrainous headache for 2 months, nausea and sensitivity to light. Complaints of blurred vision and inability to smell have developed for the last month. He did not smoke or drink alcohol. In the neurological examination of the patient





**Figure 1:** (a) Sagittal cerebral MRI, (b) FLAIR T2 cerebral MRI, (c) Axial T1 cerebral MRI

with right-hand dominance, who was admitted to the neurology outpatient clinic, he was consciously oriented, cooperative, IR + / +, KR + / +, pupillary isochoric and mobile in all directions, all extremities were full muscle strength, and the sole skin reflex was bilateral flexor. Both hands had low frequency and amplitude postural tremor, but the patient was not disturbed by this. The patient had no known disease other than migraine, and his routine hemogram and biochemistry values were within the normal range. Eye consultation was requested for the patient. There was optic atrophy in the right eye and papillary edema in the left eye. There were central scotomas in the visual field. Considering secondary headache, cranial magnetic resonance imaging (MRI) was performed in terms of space-occupying lesion. A mass was detected in the olfactory groove. Neurosurgery and radiology were consulted. The olfactory was reported as groove meningioma. Levetiracetam 500 mg 2x1 for epileptic seizure prophylaxis and dexamethasone 4 mg 4x1 for treatment of cerebral edema were started. The patient was directed to neurosurgery for the operation.

**Discussion:** Foster Kennedy syndrome, named after neurologist Robert Foster Kennedy (1884–1952), describes unilateral ipsilateral optic atrophy and contralateral papilledema from an intracranial mass. This syndrome is unreliably associated with anosmia and ipsilateral proptosis.<sup>[1]</sup> Foster Kennedy syndrome is uncommon, and numerous case series show its incidence to be less than 1% in conjunction with intracranial neoplasms. The largest series, performed in Germany by Tonniss in 1962 found 28 cases of Foster Kennedy syndrome in a series of 3,033 patients with intracranial tumors.<sup>[2]</sup> The mechanism of optic atrophy and contralateral papilledema has not been well elucidated. In 1911, Robert Foster Kennedy postulated that optic atrophy was a result of direct optic nerve compression and contralateral disc edema resulted from elevated intracranial pressure. A subsequent study supported this hypothesis in only 22% of the cases of Foster Kennedy syndrome.<sup>[3]</sup> Migraine attacks decrease in frequency or cease completely after the age of 50–60 years in the majority of both male and female patients.<sup>[4,5]</sup> In a substantial minority of patients over 60, however, migraine attacks persist, resulting in a high absolute number of elderly patients with migraine.<sup>[4,6]</sup> The incidence of new-onset primary migraine over the age of 60 is largely unknown. Only one study found that 0.5% of all new-onset headaches in patients over the age of 65 were migraine headaches (compared to 53% of new-onset headaches in the age group < 65 years).<sup>[7]</sup> The lifetime prevalence of migraine in individuals over 55 years is 20–34%.<sup>[6]</sup> Clinically, migraine characteristics can change with increasing age. Attack severity decreases, throbbing or pulsating headaches become less frequent, and accompanying symptoms occur less often,<sup>[8]</sup> which hampers distinguishing these migraines from tension-type headaches.<sup>[9]</sup>

**Conclusion:** The prevalence of migraine is lower in elderly patients compared to younger patients. In patients with a history of migraine, attack frequency and typical characteristics decrease with advanced age. A detailed history should be taken and care should be taken in terms of secondary headaches in patients presenting with advanced migrainous headache.

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## PA5

### A Case of Spontaneous Hemiplegic Migraine

Gülcan Göçmez Yılmaz

Mersin Şehir Eğitim ve Araştırma Hastanesi, Mersin, Turkey

**Address for correspondence:** Dr. Gülcan Göçmez Yılmaz,  
Mersin Şehir Eğitim ve Araştırma Hastanesi, Mersin, Turkey.  
E-mail: gocmezgulcan@gmail.com

**Introduction:** Hemiplegic migraine (HM) is a rare form of migraine with aura, accompanied by reversible unilateral weakness in the aura period. Motor weakness starts in the aura period, spreading to the arms and face, primarily in the hands, and visual symptoms are common in the aura, and other symptoms can also be seen, such as tingling, numbness, ataxia, fever or lethargy aura. This present case describes a rare case of spontaneous hemiplegic migraine.

**Case:** A 38 year-old woman applied with the complaints of dizziness and ataxia. The patient had right hemiparesis besides the complaint of marked ataxia. The patient complained of severe headache that started unilaterally and continued bilaterally. It was learned that the patient was accompanied by nausea and vomiting before the headache. Her complaints continued for 3 days and she had photophobia and phonophobia accompanying headache. The patient was conscious but had difficulty concentrating and responding to questions. The neurological examination; she has right hemiparesis and ataxia. Her muscle strength was grade 4 on manual muscle testing. She also had no hypertension, diabetes mellitus, cardiac disease, coagulation disorder or proximal muscle weakness. There is no family history. Routine laboratory examination findings, magnetic resonance and electroencephalogram were normal. The patient was diagnosed with sporadic HM according to The International Classification of Headache Disorders (ICHD) - 3 diagnostic criteria. Domperidone, nsaids, eletriptan was given to the patient as acute treatment, and verapamil 3x80 treatment was arranged as prophylactic treatment.

## PA6

### SUNCT-Like Syndrome Leading Acute Ophthalmic-Distribution Herpes Zoster: A Case Report

Hande Peran, Cansu Kurt, Esra Karabal Arda<sup>1</sup>, Ufuk Emre

Departments of Neurology and <sup>1</sup>Dermatology, Health Sciences University İstanbul Education and Training Hospital, Istanbul, Turkey

**Address for correspondence:** Ass. Dr. Hande Peran,  
Departments of Neurology, Health Sciences University İstanbul Education and Training Hospital, Istanbul, Turkey.  
E-mail: hande.peran@gmail.com

**Background:** Short-lasting unilateral neuralgiform headaches with conjunctival injection and tearing (SUNCT) syndrome is one of the trigeminal autonomic cephalalgias. Its etiology is generally idiopathic, though rarely it has been associated with viral infections. Here, we report a patient with herpes zoster ophthalmicus presented initially with a headache mimicked the SUNCT syndrome.

**Case Presentation:** A 68-year-old female patient presented with a headache in the right side of her head that continued for 5 days. The pain was experienced around the eye and radiated to the right temporal region. It was very intense, had a stabbing quality, lasted for 2-3 s and repeated 100-150 times. Also, eyelid edema and tearing and hemorrhage in the eye were present. When the patient was under carbamazepine 400 mg/day treatment with a diagnosis of SUNCT syndrome, vesicular desquamation occurred on the hairy skin of the right frontal region on the seventh day of the pain onset. The eye examination revealed herpetic keratitis. Acyclovir 800 mg/day and eye drops were started by the department of dermatology with a diagnosis of herpes zoster ophthalmicus. The headache disappeared completely under carbamazepine 800 mg/day and antiviral treatment with acyclovir.

**Conclusion:** SUNCT like syndrome can be the initial clinical presentation immediately preceding an acute ophthalmic-distribution zoster. Zoster-related SUNCT like syndromes seem to respond well to symptomatic treatment. Clinicians should be aware of ophthalmic zoster in SUNCT-like headaches.

**KEYWORDS:** Headache, herpes zoster infection, SUNCT like syndrome

## PA8

### A Case of Cluster Headache Presenting with Partial Horner's Syndrome

Huzeyfe Köklü, Can Ulutaş, Buse Rahime Hasırcı Bayır

Department of Neurology, Haydarapasa Numune Training and Research Hospital, University of Health Sciences, Istanbul, Turkey

**Address for correspondence:** Dr. Huzeyfe Köklü,

Department of Neurology, Haydarapasa Numune Training and Research Hospital, University of Health Sciences, Istanbul, Turkey.

E-mail: huzeyfe.koklu@gmail.com

**Introduction:** Cluster headache is a rare primary headache. Diagnosis can be more difficult, especially when it occurs with Horner-like syndrome.

**Case Report:** A 52-year-old male patient presented to the emergency department with a complaint of drooping of the right eyelid. The patient had a severe headache on the right side which occurred 1-2 times during the day, waked him from sleep, lasting 1-3 hours, and was accompanied by nasal congestion and ptosis on the right side. In his past, the patient had migraine attacks, and there was no regular medication use. In the neurological examination, only ptosis and miosis were detected on the right eye without anhidrosis. Cranial MR, thorax CT, and cranial CT angiography were normal. Pre-diagnoses of subarachnoid hemorrhage, pituitary apoplexy, arterial dissection, arteriovenous malformation which could lead to sudden onset and severe headache, were excluded with intracranial imaging. Cluster headache accompanied with partial Horner syndrome was considered in the patient who stated that he had not experienced such severe headache in his life. Eletriptan was started as an attack treatment and GON blockade was performed. A regression was observed on headache severity and recurrence times in a day.

**Conclusion:** Cluster headache is characterized by severe unilateral headache accompanied by prominent unilateral cranial autonomic symptoms. Partial Horner's syndrome occurs only in 12% of the patients with cluster headache. Therefore, cluster headache should be kept in mind, when patients presented with partial Horner syndrome and severe headache.

## PA9

### Cerebellar Tonsillar Herniation And Intracranial Hypotension Resolving After Kyphoscoliosis Surgery in Gorham Stout Syndrome: A 10 Years Follow-Up

Okan Sökmen, Rahşan Göçmen<sup>1</sup>, Aslı Tuncer, Nural Kiper<sup>2</sup>, Işın Ünal-Çevik

Departments of Neurology, <sup>1</sup>Radiology and <sup>2</sup>Pediatrics, Pulmonology Unit, Faculty of Medicine, Hacettepe University, Ankara, Turkey

**Address for correspondence:** Prof. Dr. Işın Ünal-Çevik,

Departments of Neurology, Pulmonology Unit, Faculty of Medicine, Hacettepe University, Ankara, Turkey.

E-mail: isin.unalcevik@gmail.com

Gorham Stout Syndrome (GSS) is a rare multisystem disorder of childhood-onset, characterized by lymphatic vessel proliferation within the bone, leading to osteolysis and deformities. In GSS, chylothorax is a risk factor for poor prognosis. Rarely, lymphangiomatosis and severe osteolysis may affect the skull and the meninges, leading to continuous cerebrospinal fluid leakage, intracranial hypotension, and cerebellar tonsillar herniation. Here, we report a 10 years follow-up of a unique case of GSS, whose cerebellar tonsillar herniation and intracranial hypotension completely resolved after kyphoscoliosis surgery, but recurred 2 years later. At the age of 11, our patient first presented with multiple lytic bone lesions, chylothorax and kyphoscoliosis. Three years later she developed an orthostatic headache and intracranial hypotension. At the age of 16, due to uncontrolled back pain and progressive

kyphoscoliosis, orthopedic surgery was planned. The brain MRI revealed signs of intracranial hypotension and cerebellar tonsillar herniation. Interestingly, severe cerebellar herniation completely resolved after kyphoscoliosis surgery. At the age of 20, she was admitted to our Headache Clinic due to the recurrence of orthostatic headache. Intracranial hypotension was unresponsive to conservative treatment, thus an epidural blood patch was performed, and provided temporary headache relief for 8 months. In GSS cases with severe tonsillar herniation and intracranial hypotension, conservative treatments may not be effective. Prompt evaluation and interventional approaches may be considered.

**KEYWORDS:** *Cerebrospinal fluid, epidural blood patch, leakage, magnetic resonance imaging, orthostatic headache*

## PA10

# Role of Ketamine Infusion in The Management of Intractable Trigeminal Neuralgia Due to Multiple Sclerosis

Ayşegül Akyüz, Nishana Zakharova<sup>1</sup>, Işın Ünal-Çevik<sup>1</sup>, Aslı Tuncer<sup>1</sup>, Nalan Çelebi

Departments of Anaesthesiology and Reanimation and <sup>1</sup>Neurology, Hacettepe University, Faculty of Medicine, Ankara, Turkey

**Address for correspondence:** Prof. Dr. Işın Ünal Çevik,

Departments of Neurology, Pulmonology Unit, Faculty of Medicine, Hacettepe University, Ankara, Turkey.

E-mail: isin.unalcevik@gmail.com

**Background:** Trigeminal neuralgia (TN) is an excruciating neuropathic pain characterized by brief, electric shock-like, purely paroxysmal or with concomitant continuous pain in the distribution of the trigeminal nerve. Primary TN, is either idiopathic or classical (with neurovascular contact) or, as secondary TN caused by pathologies other than neurovascular contact, such as Multiple Sclerosis (MS). The antiepileptic drugs are the first-line pharmacological treatment options in TN. In refractory cases, interventional pain management or surgery may be considered. The management of MS-related TN can be challenging especially the acute exacerbations.

**Case Report:** A 54 years old female patient with history of MS and TN was admitted to our Neurology clinic, due to nausea, vomiting, dizziness, weakness in the lower extremities and ataxia. She had a history of both carbamazepine and oxcarbazepine induced hyponatremia and previously had 4 Gasser ganglion RFL for TN. On admission she was taking phenytoin 300mg/d, pregabalin 600mg/d, lamotrigine 100mg/d and baclofen 40 mg/d. The neurological examination revealed horizontal nystagmus, ataxia and paraparesis. Brain MRI was stable, no active demyelinating lesion or vascular compression on the trigeminal nerve. Clinical and laboratory findings were compatible with phenytoin toxicity. After discontinuation of phenytoin, although the phenytoin levels were still 2-3 times higher than the normal limits, the patient started to have multiple episodes of TN attacks. Lacosamide, valproic acid, topical lidocaine and tramadol did not relieve the attacks. The attacks were very frequent (almost 60 times a minute) and intensified, resembled like a status picture, so-called “status neuralgia”. The patient was not able to sleep, touch, talk or eat and nasogastric tube was introduced. The pain was only controlled with low-dose ketamine infusion 40 mg/day for 5 days and low dose phenytoin was introduced with complete recovery. The patient started to eat, talk, touch her face and sleep. After 1 week she was now eligible for a repeat gasser ganglion RFL and her anti-epileptics were gradually tapered off after the procedure.

**Discussion:** Severe exacerbation in TN patients characterized by an increase in the frequency and intensity of pain, can cause inability to eat or drink and may require admission to hospital. Intravenous infusions of fosphenytoin (15mg/kg over 30min) and lidocaine (5mg/kg over 60min) under cardiac monitoring can be highly effective. However our patient had history of adverse events to carbamazepin and oxcarbazepin and presented with phenytoin toxicity. She was already receiving sodium channel blocker antiepileptics thus we introduced i.v. ketamine infusion. Ketamine is an anesthetic agent derived from phencyclidine, and a NMDA antagonist, which can also be used in refractory chronic pain. Considering the illicit abuse for its ability to provide a dissociative high, ketamine should be administered for short-term by specialised teams with expertise. In refractory TN cases who develop adverse reactions to antiepileptics, a 5 days course of low-dose iv ketamine infusion may be considered.

**KEYWORDS:** *Acute exacerbation, antiepileptics, neuropathic pain, orofacial, refractory, treatment*

## PA11

## Cavernous Sinus Thrombosis Due To Mucormycosis after Covid-19 Pneumonia

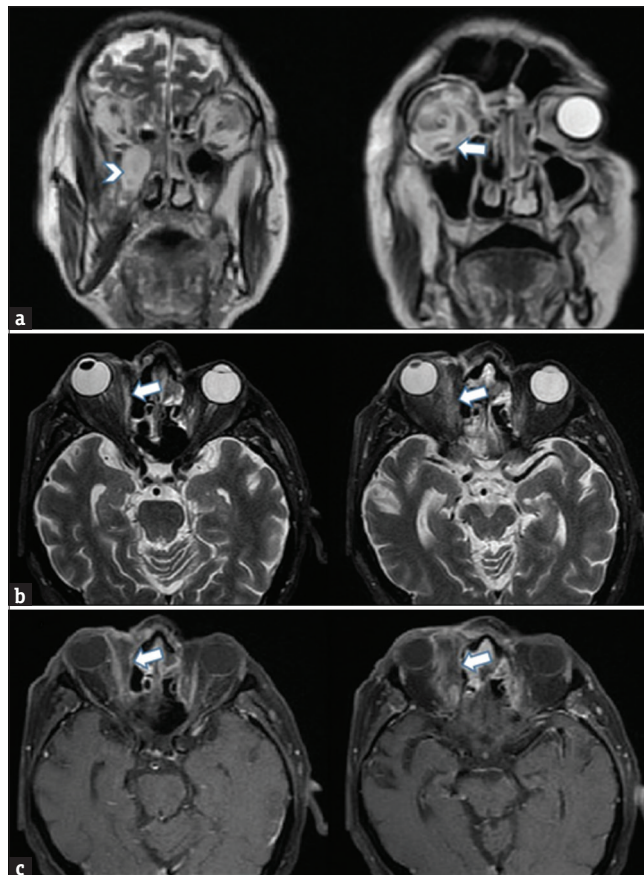
Murat Alemdar

Department of Neurology, Sakarya University, Faculty of Medicine, Sakarya, Turkey

**Address for correspondence:** Assoc. Prof. Murat Alemdar,  
Department of Neurology, Sakarya University, Faculty of Medicine, Sakarya, Turkey.  
E-mail: dr.alemdar@gmail.com

**Background:** Cavernous sinus thrombosis (CST) is among the rare causes of headaches. Patients with covid-19 infection might be complicated by arterial thrombosis or venous thromboembolism during their clinical follow-up. To the best of our knowledge, there are a few case reports of CST developed after covid-19. Herein, we aimed to present a diabetic patient presented with unilateral headache after the covid-19 pneumonia and diagnosed with CST.

**Case Report:** A 61-year-old male was hospitalized for covid-19 pneumonia in our hospital for 10 days, approximately two months ago. Two weeks after the discharge, he began to suffer from a gradually increasing frontal headache. Within last 2 days, a severe throbbing pain including his right forehead and periorbital region was developed. Swelling and redness on his right eyelid also existed. In past medical history, there was a coronary by-pass operation, atrial fibrillation, heart failure and uncontrolled diabetes. He was dehydrated during the examination in ER, and hospitalized to intensive care unit. Although his visual acuity was preserved, diplopia due to limitations in right globe movements, exophthalmos and ecchymosis were developed in follow-up. He was diagnosed with CST after contrast enhanced MRI [Figure 1]. Cavernous sinus thrombectomy was performed. Mucormycosis was diagnosed



**Figure 1:** (a) Coronal T2-weighted sequences, (b) axial T2-weighted sequences, (c) contrast enhanced T1-weighted sequences of MRI revealing an hyperintense material fulfilling the right maxillary sinus, and inflammatory changes showing gadolinium enhancement in mucosa of the sinus wall extending through the medial wall of orbit and the right medial rectus muscle

with examination of extracted material. Significant improvement was achieved with this prompt surgical intervention, anticoagulant and anti-fungal treatment.

**Conclusion:** The physicians should consider the probability of CST in differential diagnosis of the patients with persistent unilateral periorbital pain, in particular ones with prothrombotic risk factors like uncontrolled diabetes, dehydration and recent covid-19 infection.

**KEYWORDS:** *Cavernous sinus thrombosis, COVID-19, headache, mucormycosis*

## PA12

### Management of Migraine in Family Practice

*Nil Tekin*

Department of Family Medicine, Narlidere Residential and Nursing Home, Izmir, Turkey

**Address for correspondence:** Assoc. Prof. Nil Tekin,  
Narlidere Residential and Nursing Home, Izmir, Turkey.  
E-mail: niltekin33@yahoo.com

**Background:** Headache is an important health problem frequently encountered by family physicians. The World Health Organization recognizes it as one of the most restrictive diseases. The most common headaches are migraine and tension-type headaches, which are classified as primary headaches.

**Aim:** In this study, attention was drawn to the importance of headache in family practice; It is aimed to review the basic principles in the approach to migraine.

**Methods:** National and international literature on the approach to migraine in family medicine has been reviewed.

**Results.** The etiology, frequency and vital consequences of headache types can vary greatly. A good history should be taken to identify the most likely type of headache, symptoms of severe secondary headaches, and significant comorbidities. Secondary headaches should be excluded with physical examination, neurological examination, laboratory and targeted imaging methods. Keeping a headache diary can document migraine attack frequency, symptoms, precipitating and exacerbating conditions, and treatment response over time in family practice. Other than drug therapy, factors that improve migraine (sleeping, a dark and quiet environment) should be evaluated. It is recommended to review medicines and question over-the-counter drugs at each meeting. Decisions and changes should be discussed with the patient.

**Conclusion:** The characteristics of the family medicine discipline such as biopsychosocial approach, holistic care, continuity and patient-oriented approach are effective in the fight against migraine, which is a public health problem. Increasing the level of knowledge about the approach to migraine, recognizing its types and effective management of the disease are important in family practice.

**KEYWORDS:** *Family medicine, headache, migraine*

## PA13

### Lumbar Epidural Steroid Injection for Treating Coccydynia Caused by Tarlov Cyst – A Case Report

*Ümit Akkemik*

Department of Algology, Konya City Hospital, Konya, Turkey

**Address for correspondence:** Dr. Ümit Akkemik,  
Department of Algology, Konya City Hospital, Konya, Turkey.  
E-mail: umitak87@gmail.com

**Introduction:** Perineural cysts are sacs filled with cerebrospinal fluid that are located in the spinal canal in the S1–S4 region of the spinal cord. Sacral perineural cysts, also called Tarlov cysts, were first described by Tarlov in 1938, and their etiology is unknown. We present a patient with coccydynia due to Tarlov cyst, in which we applied lumbar epidural steroids.

**Case Report:** A 44-year-old female presented to the polyclinic with a complaint of pain in the coccyx region since approximately 3 years; the pain had occasionally worsened but became continuous for the last 6 months. No motor



or neurological deficits were discovered on examination. A 11 × 2 cm-sized perineural cyst that extended from the L5 level to the sacral S3 levels was observed during lumbar and sacral MRI upon diagnosis of coccydynia. An epidural injection (L3–L4 intralaminar approach) was administered to the patient under fluoroscopy by diluting dexamethasone 8 mg/2 ml in 0.9% saline to 10 cc. The pain reduced by 70%–80% by the third month of follow-up as a result of the procedure.

**Discussion:** Reported symptoms of Tarlov cysts include back pain, perineal pain, sciatica, coccydynia and motor disturbances of the lower extremities and genitals. No available treatment has yet been proven to be effective due to the unclear pathogenesis and pathophysiology of Tarlov cysts. It should be noted that it can be applied in cases of pain palliation in patients who do not have a surgical indication but are unresponsive to medical treatment.

## PA14

### Fibromyalgia After Inactivated SARS-CoV-2 Vaccine – Case Report

Ümit Akkemik

Department of Algology, Konya City Hospital, Konya, Turkey

**Address for correspondence:** Dr. Ümit Akkemik,  
Department of Algology, Konya City Hospital, Konya, Turkey.  
E-mail: umitak87@gmail.com

**Background:** Fibromyalgia is a disease characterized by chronic widespread musculoskeletal pain accompanied by various symptoms such as fatigue, sleep disorders and cognitive disorders. Here, we describe, to our knowledge, the first reported case of fibromyalgia following the COVID-19 inactivated vaccine (Coronovac).

**Case:** A 32-year-old female patient presented with complaints of fatigue and widespread body pain that started 14 days after the first dose of the inactivated SARS-CoV-2 vaccine approximately 4 months ago. On physical examination, pain was present in 4 out of 5 parts of the body according to the Fibromyalgia diagnostic criteria. Widespread Pain Index was determined as 8 and Symptom Severity Scala Score was determined as 6. In the motor and neurological examination of the patient, no pathology was detected except soft tissue sensitivity. No abnormal results were reported in the routine blood examination. With the diagnosis of fibromyalgia, exercise was recommended to the patient and duloxetine 30mg was prescribed. At the follow-up 2 months later, 80% reduction was detected in the patient's complaints.

**Conclusion:** Although there have been many studies on fibromyalgia, however, the etiology of the disease is still a matter of debate. It is not clear that the reason for the emergence of fibromyalgia in our case is due to the vaccine. But, we did not find any other situation that would suggest that the patient's symptoms may be a trigger before the onset of symptoms. There is a need for advanced studies to be conducted with large patient groups after the vaccination.

## PA15

### A Case Of Migraine with Aura Worsening After Covid-19 Infection

Yasemin Ekmekyapar Fırat

Department of Neurology, Faculty of Medicine, SANKO University, Gaziantep, Turkey

**Address for correspondence:** Assistant. Prof. Yasemin Ekmekyapar Fırat,  
Department of Neurology, Faculty of Medicine, SANKO University, Gaziantep, Turkey.  
E-mail: yaseminekmekyapar@gmail.com

**Introduction:** Migraine is one of the most common primary headache disorders. Fifteen to twenty percent of all patients with migraine suffer from migraine with aura. Visual aura is most common. The effect of the COVID-19 on the nervous system remains undefined. One of the most frequently symptoms preceding or occurring during and after SARS-CoV2 infection is headache. The mechanism of the development of neurological symptoms in COVID-19 is still unknown. There is limited information on how COVID-19 affects patients with a history migraine. Here, we present the case of a history of migraine whose headache character is the change of after COVID-19 infection.

**Case:** A 24-year-old right-handed male with a 3-year history of migraine with aura (2-3 attacks/week). These were mostly right-sided pulsating headache with nausea, photophobia and phonophobia, sometimes vomiting, lasting mean



24 hours. His visual symptoms consist of white, bright, jagged spots and black and white flashes with sparkles and dots 20 minutes before headache. Neurological examination was normal. Brain magnetic resonance imaging (MRI) and electroencephalogram (EEG) were normal. He used propranolol and amitriptyline with no effect. He was then treated with venlafaxine 75 mg/day. His headache and aura were controlled. Then he had a COVID-19 infection in March 2020. He has suffered from prolonged aura without headache after COVID-19. He took lamotrigine 50 mg/day and visual symptoms were treated, but this was discontinued because of dermatological side effects. Lamotrigine changed with valproate and his aura was controlled again.

**Discussion:** Headache is one of the most common and often the first neurological symptom in patients with confirmed infection. The features of the headache are bilateral, pulsating, pressing, stabbing, dull and demonstrate analgesic resistance. The mechanism by which headache occurs in COVID-19 remains unclear. In this case, the patient had a controlled migraine with aura, then worsening of visual aura after COVID-19 infection. It is important differential diagnosis to exclude other causes of visual disturbances. Visual auras are thought to be associated with cortical spreading depression (CSD). In the literature, 3 cases that were followed up with migraine without aura and developed aura during COVID-19 infection have been reported. It may suggest a relationship between COVID-19 and CSD. Given its prevalence, many patients with migraine have and will be infected with COVID-19. Their experience has not yet been enough reported.

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## Association between the occurrence of primary headache and internet addiction: A cross-sectional study

Mansoureh Togha MD<sup>1</sup>, Hamed Khoshakhlagh<sup>1</sup>

<sup>1</sup>Headache Department, Iranian Center of Neurological Research, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran

**Address for correspondence:** Dr.Hamed Khoshakhlagh

Headache Department, Iranian Center of Neurological Research, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran.

E-mail: hamed.khoshakhlagh@gmail.com

**Background:** Internet addiction is becoming a global issue. Internet Addiction is defined as excessive impulsive compulsive use of the internet in a way that disturbs normal daily function and despite knowing its adverse consequences, the user tends to use it again and again.

**Aim:** To evaluate the correlation between the occurrence of primary headache and internet addiction.

**Methods and Materials:** This cross-sectional study was conducted on 418 medical students of Tehran University of Medical Sciences. The students completed an online version of the Standard Headache Survey to detect the headaches and Young's Internet Addiction Test (YIAT) to evaluate their internet addiction.

**Results:** Internet addiction was associated with the occurrence of primary headache significantly (P-Value<0.05) though its association with the type of headache (whether TTH or Migraine), the occurrence of aura in migraineurs, frequency, and duration of headache was not significant (P-Value for all > 0.05).

**Conclusion:** According to a direct association between the occurrence of primary headache and dependency on the internet, it should be considered as one of the important issues and it is better to be checked in taking a history from persons with headaches. As observed in the other studies, the type of headache is not associated with internet addiction.

## The correlation between serum vitamin B12 level and COVID-19 induced headache: An observational study

Soodeh Razeghi Jahromi<sup>1c</sup>, Mansoureh Togha<sup>2\*</sup>, Shadi Arianfar<sup>2,4</sup>, Zeinab Ghorbani<sup>2,3</sup>

<sup>1</sup>Headache Department, Iranian Centre of Neurological Research, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran, <sup>2</sup>Headache Department, Neurology ward, Sina Hospital, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran, <sup>3</sup>Department of Clinical Nutrition and Dietetics, Faculty of Nutrition and Food Technology, National Nutrition and Food Technology Research Institute, Shahid Beheshti University of Medical Sciences, Tehran, Iran, <sup>4</sup>Cardiovascular Diseases Research Center, Department of Cardiology, Heshmat Hospital, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran, <sup>5</sup>Department of Clinical Nutrition, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran

\* Correspondence: toghae@sina.tums.ac.ir <sup>1</sup>Department of Headache, Iranian Centre of Neurological Research, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran.

<sup>6</sup> Presenter:soodehrazeghi@gmail.com

**Background:** The overall rate of headache in hospitalized COVID-19 patients was reported to be about 47.1% at the time of admission. One of the well-known consequences of low levels of serum B12 is increasing homocysteine level. Hyperhomocysteinemia leads to inflammation, oxidative stress, and endothelial cell dysfunction, the important pathophysiological implications which are proposed to be involved in COVID-19 pathogenesis. Observational studies have reported lower serum levels of vitamin B12 among migraineurs, which might be due to the relationship between hyperhomocysteinemia and migraine headache. Thus, in the current study we aimed to evaluate the possible association between serum vitamin B12 level and COVID-19 induced headache.

**Methods:** Eighty-four hospitalized patients with COVID-19 were recruited in current observational study. COVID-19 was diagnosed based on WHO interim guidance and the recommendations of the Iranian National Committee of Covid-19, by an infectious disease specialist. Patients with any questionable symptoms of Covid-19 infection were checked for the disease via chest computed tomography (CT) scan and Real-time polymerase chain reaction (RT-PCR). Serum vitamin B12 level of all subjects diagnosed by Covid-19 infection was measured using ELISA. Headache was diagnosed by an expert neurologist headache-specialist.

**Results:** Thirty-eight (45.2%), 27 (32.1%), and 19 (22.6%) of the studied patients were suffered from mild, moderate, and severe COVID-19 disease, respectively. None of these categories of patients differ in having headache complaint (P-value = 0.303). Although serum vitamin B12 level was lower among patients who suffered from headache, the difference was not significant ( $577.83 \pm 459.95$  vs.  $813.35 \pm 677.43$ , P-value = 0.266). Also according to Pearson correlation analysis the association between serum B12 and CRP level was not significant (P-value = 0.731).

**Conclusion:** Serum level of vitamin B12 was lower among COVID-19 patients with headache though the difference was not significant.

#### **Funding:**

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**KEYWORDS:** *Migraine, Headache, COVID-19, vitamin B12*

## **Clinical characteristics of 365 Hospitalized COVID-19 Patients with Neurological Symptoms: An Observational Study**

*Fahimeh Vahabizad*

Department of Neurology, Sina hospital, Tehran University of Medical Sciences, Tehran, Iran

**Address for correspondence:** Assistant. Prof. Fahimeh Vahabizad,  
Department of Neurology, Sina hospital, Tehran University of Medical Sciences, Tehran, Iran.  
E-mail: fahime.vahabizad@gmail.com

**Objective:** Since the beginning of the COVID-19 pandemic, a number of COVID-related neurological manifestations have been reported. We aimed to categorize the features of hospitalized COVID-19 patients who experienced neurological symptoms.

**Methods:** In this descriptive, cross-sectional study, we enrolled all patients hospitalized with COVID-19 who experienced neurological symptoms in two hospitals in Tehran. Diagnosis of COVID-19 was established by PCR tests or computed tomography of the chest combined with COVID-19 clinical findings. The clinical characteristics, laboratory data, and imaging findings from 365 patients were analyzed.

**Results:** The average patient age was  $43.3 \pm 11.8$  years and included 213 males and 152 females. The most prevalent neurological symptoms were headache (56.2%), impaired consciousness (55%), and dizziness (20.5%). During hospitalization, most of the patients did not require mechanical ventilation (81.9%). The percentage of patients with end-organ damage was 9% and mortality was 15%. Regression analysis on the neurological symptoms indicated that

the mortality rate of patients with headaches was 84% lower than for the other neurological symptoms. Hyperglycemia was significantly related with end-organ damage and mortality ( $p = 0.029$ ,  $p = 0.08$ , respectively). New vascular lesions were evident on brain MRIs of 9 patients and brain CTs of 16 patients.

**Conclusion:** Among the neurological symptoms of patients with COVID-19, headache appeared to indicate a protective factor against development of end-organ damage as well as mortality.

**KEYWORDS:** COVID-19, end-organ damage, headache, mortality, neurological manifestations, unconsciousness

## Cranial Autonomic Symptoms in Episodic and Chronic Migraine: A Cross Sectional Study in Iran

Mansoureh Togha, Elham Jafari, Atieh Moosavian, Abolfazl Farbod, Shadi Ariyanfar<sup>1</sup>, Fatemeh Farham

Headache Department, Iranian Center of Neurological Research, Neuroscience Institute, Tehran University of Medical Sciences,

<sup>1</sup>Department of Clinical Nutrition and Dietetics, Faculty of Nutrition and Food Technology, Shahid Beheshti University of Medical Sciences, Tehran, Iran

**Address for correspondence:** Dr. Fatemeh Farham

Headache Department, Iranian Center of Neurological Research, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran.

E-mail: ffarham@yahoo.com

**Background:** Cranial autonomic symptoms (CAS) are common in migraine, with a reported prevalence of 27% to 73%. Conjunctival injection and tearing are the most common CAS.

**Aims:** To evaluate the frequency and characteristics of cranial autonomic symptoms in migraine.

**Methods:** This was a cross-sectional study of 904 patients who presented with migraine to a headache referral clinic. The participants filled out a questionnaire about their headache characteristics, as well as the presence of CAS. A total of 904 patients, 698 women (77.2%) and 206 men (22.8%), were included in the study, with a mean (SD) age of 38.05 (11.76) years.

**Results:** About 63.1% of subjects reported one or more CAS, chronic migraine more than those with episodic migraine. The two most commonly reported autonomic symptoms were eye redness and tearing. Chronic migraine, unilateral headache, and visual obscuration were significantly more frequent in migraineurs with CAS. Headache intensity and frequency in subjects with CAS were significantly higher than in those without CAS.

**Conclusion:** We found higher percentages of CAS in unilateral headaches and in patients with frequent and severe attacks accompanied by visual distortion. A diagnosis of CAS accompanying migraine may predict more severe disease and the possibility of evolution into chronic migraine.

**KEYWORDS:** Cranial autonomic symptoms, migraine, trigeminal autonomic cephalalgias, visual distortion

## Increased Serum Prolactin Levels May Contribute to Migraine Attacks: A Case-control Study Comparing Migraineurs and Healthy Subjects

Mansoureh Togha<sup>1,2</sup>, Shiva Nematgorgani<sup>3</sup>, Zeinab Ghorbani<sup>4,5</sup>, Pegah Rafiee<sup>2</sup>, Samaneh Haghighi<sup>1</sup>

<sup>1</sup>Headache Department, Iranian Centre of Neurological Research, Neuroscience Institute, Tehran University of Medical Sciences,

<sup>2</sup>Headache Department, Neurologyward, Sina Hospital, School of Medicine, Tehran University of Medical Sciences, <sup>3</sup>Department of Clinical Nutrition and Dietetics, Faculty of Nutrition and Food Technology, National Nutrition and Food Technology Research Institute, Shahid Beheshti University of Medical Sciences, Tehran, <sup>4</sup>Cardiovascular Diseases Research Center, Department of Cardiology, Heshmat Hospital, School of Medicine, Guilan University of Medical Sciences, <sup>5</sup>Department of Clinical Nutrition, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran

**Address for correspondence:** Dr. Shiva Nematgorgani,

Department of Headache, Iranian Centre of Neurological Research, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran.

E-mail: toghae@sina.tums.ac.ir

**Background:** Migraine is a prevalent, multifactorial disorder. The exact pathological process of migraine remains unclear. Studies have revealed changes in serum prolactin (PRL) levels in relation to migraine, although the results have been inconsistent. The present case-control study assessed the serum level of prolactin in migraine patients.

**Methods:** In this case-control study participants were divided into chronic (CM; n = 39) and episodic (EM; n = 100) migraine groups along with 30 age- and sex-matched headache-free controls. In the EM group, prolactin levels were measured during an attack (ictal) and between attacks (interictal). After obtaining demographic, anthropometric data, and headache characteristics, blood samples were gathered and analyzed to evaluate the serum levels of prolactin.

**Results:** A significant difference was observed between the control, CM, and ictal EM and interictal EM groups. The serum prolactin levels of the chronic migraineurs and those with ictal EM were comparable and were significantly higher than for interictal EM patients and the headache-free control subjects ( $p < 0.001$ ). Although the mean serum concentration of prolactin for the interictal EM group tended to be higher than for control individuals, this difference was not statistically significant. The Spearman correlation test also showed significant correlations between the serum prolactin levels and the number of headache days among migraineurs and the body mass index (BMI) of the subjects.

**Conclusion:** The findings suggest that changes in prolactin levels are related to the pathogenesis of migraine attacks and may contribute to the progression of migraine headaches.

#### **Funding**

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**KEYWORDS:** *Headache, migraine, prolactin*

## **Evaluation and Comparison of Migraine Headache Characteristics and Course, Life Style Changes, and Medication Intake Before and During the Covid19 Pandemic**

*Mansoureh Togha, Mahsa Babaei, Sahar Ebadi, Elham Jafari, Fahime Martami, Shadi Arianfar*

Headache Department, Iranian Center of Neurological Research, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran

**Address for correspondence:** Dr. Mahsa Babaei,

Headache Department, Iranian Center of Neurological Research, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran.

E-mail: mahbabaei95@gmail.com

**Background:** The Covid19 pandemic has affected almost all aspects of people's lives and health conditions. Accordingly, migraine headache, as a prevalent and highly disabling disorder, has been significantly affected by the pandemic. Several studies have reported improvements and some have revealed worsening of these headaches during the pandemic. Understanding the effects of the pandemic on migraine headache characteristics and its associating factors can help us for future preventive and therapeutic purposes, and better understanding the nature of this disorder.

**Aim:** Our aim was to compare the changes of migraine headache characteristic and course, and its associating factors, as well as migraine medication intake before and during the Covid19 pandemic.

**Method:** In this cross-sectional study, we used a self-report survey. A total 380 well-answered surveys were entered to the study. Data were analyzed using SPSS.

**Results:** Migraine headache frequency, severity, and the duration of attacks have significantly increased during the pandemic, compared to pre-pandemic period. Moreover, migraine medication intake has significantly increased during the pandemic. Life style changes including sleeping hours, dietary intake, smoking, and physical activity were significantly related to migraine headache frequency change in this study ( $P < 0.05$ ).

**Conclusion:** According to our results, the pandemic has negatively affected and worsened the course and characteristics of migraine headaches. Migraine medication intake has also increased during the pandemic. Moreover, migraine headache frequency change is significantly related to life style changes including sleeping hours, dietary changes, smoking, and physical activity in this study.

**KEYWORDS:** *Covid19, life style, medication intake, medication overuse, migraine headache*

### A Hemifacial Spasm Case Due to Idiopathic Intracranial Hypertension

*Sami Ömerhoca, Nurhan Kaya Tutar, Nilüfer Kale İçen*

Department of Neurology, Bağcılar Research and Training Hospital, İstanbul, Turkey

**Address for correspondence:** Dr. Sami Ömerhoca,  
Department of Neurology, Bağcılar Research and Training Hospital, İstanbul, Turkey.  
E-mail: samiyumerhodzha@yahoo.com

**Background:** Idiopathic intracranial hypertension (IIH) is a syndrome associated with increased intracranial pressure without a clear underlying cause that is classically seen in young women. Typically present with headache and ocular findings, including disc edema and, less frequently, an abduction deficit. To make a diagnosis of IIH, other than cranial nerve 6 or 7 dysfunction, patients must have a normal neurologic examination. When cranial nerve 7 is affected patients can present with hemifacial spasm.

**Case Report:** A 54-year-old female patient, two years ago presented with spasms in the left half of the face. After the diagnosis of hemifacial spasm as a result of the examinations, carbamazepine treatment was started. He was followed-up after his complaints regressed under treatment. During the follow-ups, her complaints fluctuated but increased slowly and recurred 30-35 times a day. Therefore, the patient underwent control cranial imaging. Lumbar puncture was performed to the patient for possible increased intracranial pressure due to the increase in perineural distances around both optic nerves. Since the opening pressure was found to be high, the patient was started on acetazolamide treatment, and the contractions on the left face completely disappeared in the following 2 weeks.

**Conclusion:** HFS may be a rare presenting manifestation of IIH, and treatment of IIH may result in improvement of HFS symptoms. This is a case of IIH with presenting symptom hemifacial spasm and a good response of acetazolamide treatment.

### Hypnic Headache

*Çağrı Ulukan, Elif Kocasoy Orhan*

Department of Neurology, Headache Outpatient Clinic, Istanbul Medical Faculty, Istanbul University, Istanbul, Turkey

**Address for correspondence:** Dr. Çağrı Ulukan,  
Department of Neurology, Headache Outpatient Clinic, Istanbul Medical Faculty, Istanbul University, Istanbul, Turkey.  
E-mail: cagriulukan@gmail.com

**Background:** Hypnic headache is a rare primary headache disorder in which headache attacks occur exclusively during sleep and awaken the patient. It is thought to be about 0.07% of all patients with the chief complaint of headache but in the geriatric population, the ratio is 1.4%.

**Case Report:** A 51-year-old female patient presented with a headache that started 1.5 years ago. The headache always started a few hours after falling asleep and woke her up around 4 am. This pain, which had a diffuse, bilateral and dull character, was not accompanied by any autonomic symptoms. Her pain recurred close to 10 times a month, lasting around an hour per attack. Analgesics had no effect on the headache. Fundoscopic examination did not reveal any abnormal findings. Brain MR imaging with gadolinium and routine blood work-up were within normal limits. On 3 months' follow-up, the patient was headache free under 300 mg/day lithium treatment.

**Conclusion:** Hypnic headache is an uncommon headache that should not be overlooked especially in geriatric population. Differential diagnosis must include cerebral tumors, giant cell arteritis, and sleeping disorders.

### A Case with Painful Ophthalmoplegic Neuropathy

*Nurcan Balcieva, Nikolay Sotriov, Lidia Gocheva*

Department of Neurologic, Multifunctional Hospital, Pazardzhik, Bulgaria

**Address for correspondence:** Dr. Nurcan Balcieva,  
Department of Neurologic, Multifunctional Hospital, Pazardzhik, Bulgaria.  
E-mail: hazrat@abv.bg

**Background:** Recurrent painful ophthalmoplegic neuropathy should be considered as a differential diagnosis in painful ophthalmoplegia with normal cranial neuroimaging findings.



**Case Report:** A 20-year-old woman presented with unilateral severe pulsating headache, accompanied by nausea, followed by ipsilateral ophthalmoplegia, showing third, fourth and sixth cranial nerves palsies. The headache had no relief with analgesics and NSAIDs. Fundoscopic examination did not reveal any abnormal finding. Brain magnetic resonance imaging, lumbar puncture and blood work-up were normal. The patient reported fast relief of pain within 10 hours following the administration of 60mg/day methylprednisolone. In one week we observed improvement of functions of third and fourth cranial nerves.

**Conclusion:** In patients with unilateral painful ophtalmoplegia clinical manifestation-the course of the disease, response to steroids are clue moments for the right differential diagnoses, especially in cases with normal neuroimaging findings.

## Secondary headache due to acute ischemic stroke in the posterior circulation

Murad Siyahbarli

Azerbaijan State Medical University, Baku, Azerbaijan

**Address for correspondence:** Dr. Murad Siyahbarli,  
Azerbaijan State Medical University, Baku, Azerbaijan.  
E-mail: muradsiyah@gmail.com

**Background:** Headache as premonitory or presenting symptom is more frequently associated with hemorrhagic than ischemic stroke. Ischaemic stroke in the posterior cerebral circulation, is more often associated with headache than stroke in the anterior circulation is.

**Case Report:** A 62-year-old female started experiencing headache in the left periorbital region. The patient never had never had headaches before. She had also developed eyelid ptosis, myosis and enophthalmos on the same side. A few hours later dizziness, dysphagia, ataxia occurred. Emergency cranial MRI revealed acute infarctions in the right cerebellar hemisphere, left and right thalamus and bilaterally in the occipital lobes. Both MR-angiography and CT-angiography were performed. Vascular imaging revealed occlusion of the left vertebral artery and critical stenosis of the basilar artery. The permanent headache lasted for approximately 2 weeks and was taken under control with oral Paracetamol. After 2-week time the patient got headache-free.

**Conclusion:** Headache can be a premonitory symptom of the posterior circulation stroke. Neuroimaging studies are essential in explaining the new-onset headache, especially if the headache is associated with Horner syndrome.

## Secondary Headache due to Hydrocephalus

Samira Mammadova

Da Vinci Medical Clinic, Baku, Azerbaijan

**Address for correspondence:** Dr. Samira Mammadova,  
Da Vinci Medical Clinic, Baku, Azerbaijan,  
E-mail: samiramamedova@rambler.ru

**Background:** Headache is the main complaint in patients with hydrocephalus. Chiari malformation is one of the causes of hydrocephalus, hence, in this condition patients may experience headache. Increased intracranial pressure causes headache especially in a horizontal position of the body. With the progression of hydrocephalus headache becomes more intensive, persistent and visual disturbance due to papilledema occurs. It seems reasonable to evaluate patients with posture-related headache performing cranial neuroimaging and fundoscopy. Posterior fossa decompressive surgery is an effective treatment. Of all Chiari I patients, 15%-20% will be complicated by hydrocephalus. For some of them, the hydrocephalus will resolve with ventriculoperitoneal shunting.

**Case Report:** A 27-year-old woman had started experiencing headache in a horizontal position of the body. After 3 months the headache became permanent. In parallel she developed progressively increasing bilateral ambliopia. Ophthalmology exam revealed bilateral papilledema. Cranial MRI showed Chiari-related hydrocephalus. Her headache disappeared after ventriculoperitoneal shunting surgery.

**Conclusion:** Secondary headache due to Chiari-related hydrocephalus should be considered in adult patients with posture-related headache. Fundoscopy and cranial MRI are enough to make a precise diagnosis. Headache caused by hydrocephalus complicating Chiari I malformation can be effectively treated by ventriculoperitoneal shunting.