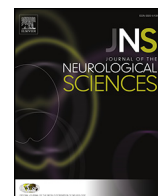




Contents lists available at [SciVerse ScienceDirect](http://SciVerse.ScienceDirect.com)

Journal of the Neurological Sciences

journal homepage: www.elsevier.com/locate/jns



Headache

481
WFN15-0858

Headache Headache in a primary health care center: an experience

J. Abad. *Rural Health, Public Health Ministry, Cuenca, Ecuador*

Background: Headache is a frequent reason for consultation, in both primary and specialized health care, it's important for non-specialist practitioners to have a clear understanding on the categorization of this symptom in order to achieve a proper diagnosis and subsequently an effective treatment.

Objective: This presentation is oriented to determine the types of headache faced on a primary health care center, of rural location.

Patients and methods: During a month of follow-up, a total of 30 headache cases were treated, characteristics like; localization, type of pain, evolution time and accompanying symptoms were assessed. Once analyzed, each case was classified using the *International Headache Society* guide.

Results: Out of 30 cases, 90% were women, 69.6% corresponded to primary headaches, and 30.4% to secondary headaches.

Conclusion: The results suggest that in a primary health care center, the tension-type headache is the most frequently encountered followed by migraine, this are very similar to other researches made over comparable populations. We can conclude that the majority of cases are manageable in a basic attention facility with limited capabilities without needing of referral to a more complex institution.

1. I have obtained patient and/or Institutional Review Board (IRB) approval, as necessary.
2. An Institutional Review Board (IRB) and/or Animal Use Committee have waived the requirement for their formal approval of the study.

Table 1
Percentage of cases by age group.

Age group	N = 30
15-24	33.3%
25-49	26.6%
50-74	16.6%
75+	23.3%

Table 2
Percentage of cases by headache type.

Headache	N = 30
Tension-type	56.6%
Migraine	13.3%
Homeostasis disorder	13.3%
Cranial/Facial disorder	10%
Substance/withdrawal	6.6%

Table 3
Outcome after treatment.

Outcome	N = 30
Successful resolution	43.3%
Unsuccessful resolution	16.6%
Improvement	23.3%
Recurrence	16.6%

doi:10.1016/j.jns.2015.08.554

482
WFN15-1157
Headache

Intracranial hypertension and thyroid papillary cancer treated with radioactive iodine: two case reports

S. Demirkaya, H. Akgun, A. Cetiz. *Department of Neurology, Gulhane Military Medical Academy, Ankara, Turkey*

Background: Idiopathic Intracranial Hypertension (IIH) presents with symptoms and signs of increased intracranial pressure without cerebral structural lesion and abnormal CSF findings. There are many causes of intracranial hypertension. Largely an underlying cause can't be found.

Objective: We presented two cases who operated for papillary carcinoma and given radioactive iodine therapy and can't be determined any other pathologies in etiology. In these two cases, tumor or administration of radioactive iodine is thought to be the cause of IIH.

Case 1: Total thyroidectomy was performed and radioactive iodine treatment was given to a 32-year-old female patient with papillary carcinoma in December 2012. One year ago she began complaining of visual obscuration and blurred vision. In this period papillary stasis was detected and MRI was normal, except that the empty sella. CSF pressure was 550 mm/H₂O. Improvement in vision was observed after CSF uptake. The complaints decreased after Diazomid treatment.

Case 2: Total thyroidectomy was made and radioiodine therapy was given to a 57-year-old female patient due to papillary carcinoma in June 2014. One month before, she was admitted with the complaint of feeling of swelling in her eyes and blurred vision. Papillary stasis was detected, CSF pressure was measured 260 mm/H₂O. Brain MRI was normal.

Conclusion: In these patients, it was not determined additional abnormality to cause Intracranial Hypertension except papillary carcinoma and radioactive iodine administration. Additionally, papillary stasis was a foreground symptom in these patients, while headache was an

insignificant symptom. We don't know whether papillary carcinoma or radioactive iodine treatment caused to IHH. However, we also recommend that the patients with similar situations should be investigated in terms of IHH or this etiology should be kept in mind in patient with IHH.

doi:10.1016/j.jns.2015.08.555

483
WFN15-0850

Headache

Clinical aspects of medication overuse headache

N. Barrientos, P. Salles, R. Juliet, A. Milán. *Department of Neurology, Dipreca Hospital, Santiago, Chile*

Clinical aspects of medication overuse headache (MOH)

Nelson Barrientos MD, Philippe Salles MD, Raúl Juliet MD, Paulina Meza MD, Ana Milán MD.

DIPRECA HOSPITAL Chile

Background: The clinical aspects of MOH based on The International Classification of Headache Disorders of International Headache Society (IHS) establish it as important in patients with overused medication and have headache crisis more than 15 days per month. However the patients present other frequent symptoms.

Objective: Determine the incidence of others symptoms such as headache after waking up in the morning, early morning awaking headache, inattention, depression and myofascial syndrome.

Patients and methods: This is a descriptive, prospective, observational and longitudinal study of 76 patients with MOH according to IHS criteria. We controlled the patients at the beginning and during treatment from 0 to 6 months.

Results: The average age is 41 years, 80.3% female and 19.7% male, average body mass index (BMI) of 24.8. The diagnosis of primary headache is migraine without aura in 100%.

The principal overuse medications are NSAID 40.8%, ergots 15.8% and triptans 14.5%.

The others symptoms most frequent at the beginning are headache after waking up in the morning 98.7%, early morning awaking headache 88.2%, myofascial syndrome 83.8% and inattention 78.9%.

Conclusion: This study shows a high incidence of patients with MOH waking with headache in the morning, early morning awaking headache, myofascial syndrome and inattention, thus these other symptoms are useful to MOH diagnosis and to following of patients. These symptoms should be considered in new classifications of MOH.

doi:10.1016/j.jns.2015.08.556

484
WFN15-0011

Headache

Headache characteristics in cannabis abuse

Y. Beckmann, M. Seçkin. *Department of Neurology, Izmir Katip Çelebi University Atatürk Training and Research Hospital, Izmir, Turkey*

Objective: We aimed to investigate a possible association between headache and cannabis use.

Method: The study population consisted of 2655 consecutive patients followed and treated by the authors in the Alcohol and Substance Dependency and Addiction Rehabilitation Center. All patients filled out a detailed headache questionnaire and 2024 patients were included. Six hundred thirty-one patients were excluded because of other substance use. We defined headache attributed to a substance or

its withdrawal according to the international classification of headache disorders of the International Headache Society 2004.

Results: Forty-two percent of patients reported having headache. Of the 2024 cannabis abusers, 95.2% were men and 4.8% were women. In this group, 49.4% of women and 28.3% of men reported headache. The mean age of all cannabis abusers was 32.2 years. The mean age of the patients with headache was 31.9 years. Based on headache characteristics on evaluation, 28.2% were diagnosed with migraine, 7.3% gave a history of tension-type headache and 0.7% reported having cluster headache. There were 8.5% patients with headache induced by acute substance use or exposure and 31.6% patients with headache attributed to substance withdrawal. 17.1% of patients reported having medication-overuse headache.

Conclusion: The younger start and the longer duration of cannabis use caused the higher incidence of headache. Migraine headaches were far more prevalent in the substance abuse patients than in previously reported community populations (10–15%). Seventy-eight percent of headache patients have never sought help from a physician despite the severity and frequency of headache.

doi:10.1016/j.jns.2015.08.557

485
WFN15-0734

Headache

The effect of cilostazol on aura and migraine headache induction and peripheral vascular function

J.H. Butt, A.S. Hansen, C. Kruuse. *Department of Neurology Neurovascular Research Unit, Copenhagen University Hospital Herlev, Herlev, Denmark*

Background: One third of migraine patients experience the aura phenomenon in addition to migraine, with aura increasing the risk of early onset stroke. The pathophysiology of both migraine and aura remains to be fully understood. Cyclic adenosine monophosphate (cAMP) plays a key role in induction of migraine headache. Cilostazol, a phosphodiesterase 3 inhibitor, which cause cAMP-accumulation, induce migraine-like attacks in both healthy subjects and migraine patients without aura. It has not been investigated if cilostazol also induces aura in migraine patients with aura (MA) and if there may be a common mechanism for the aura, migraine initiation and an increased risk of stroke.

Objective: We investigate whether cilostazol induces aura and/or migraine attacks in patients with MA. Further, the effect of cilostazol on peripheral endothelial function and association to markers of the endothelial function and cell signaling is investigated.

Methods: 16 patients are included in a randomized, double-blind, placebo-controlled crossover study with administration of oral cilostazol (200 mg) or placebo on two separate days. Aura and headache characteristics are recorded using a diary/questionnaire. Endothelial function is assessed by peripheral arterial tonometry before and after cilostazol intake.

Results: The study is ongoing and the results will be presented at the Congress.

Conclusion: Cilostazol is a specific tool to investigate the role of cAMP-signaling in MA and possible association with endothelial function and stroke and may pinpoint if aura is linked to the induction of migraine-like headache.

I have obtained Institutional Review Board approval.

doi:10.1016/j.jns.2015.08.558

486

WFN15-1581

Headache**Three years of experiences with onabotulinumtoxin A in patients with chronic migraine in Czech Republic**

D. Dolezil^a, I. Niedermayerova^b. ^aPrague Headache Centre, DADO MEDICAL s.r.o., Prague 2, Czech Republic; ^bDepartment of Neurology, Quattromedica, Brno, Czech Republic

Objective: To assess efficacy, safety and tolerability of onabotulinumtoxin A as headache prophylaxis in adults with chronic migraine in Czech Republic.

Background: Several studies have demonstrated an effect of onabotulinumtoxin A in patients with refractory chronic migraine.

Design/methods: ICHD-III beta criteria for chronic migraine were applied to symptoms described by patient headache. Diagnosis was made by ICHD-III criteria for chronic migraine. MIDAS and HIT-6 was applied in all patients at week 0 and at follow-up, and every three months after first injection. Patient diary was provided for six months for documentation of headache episode frequency. All patients had poor headache control, poor quality of life, high disability scores and high acute medication intake. Subjects were treated to injections every 12 weeks of onabotulinumtoxin A (155 U). The primary endpoint was mean change from baseline in headache episode frequency at weeks 24,36 and 48. The second endpoint was mean change from baseline in HIT-6 and MIDAS at week 24, 36 and 48.

Results: We reported data of 29 patients mean age 44 years (median 43 years), who fulfilled ICHD-III beta criteria for chronic migraine. Mean score on a pain scale of 0–10 were 8 (standard deviation 2) at week 0, MIDAS grade IV (severe disability) at week 0 and HIT-6 mean score 62 (median 62) at week 0. Fourteen patients interrupted treatment for lack of efficiency at week 12. The subjects had only one mild adverse event.

Conclusions/relevance: About 50% of our patients had the effect of treatment with onabotulinumtoxin A. Unfortunately, health insurance does not cover treatment of chronic migraine with onabotulinumtoxin A in Czech Republic.

doi:10.1016/j.jns.2015.08.559

487

WFN15-1074

Headache**Benign paroxysmal torticollis, vertigo and migraine attacks in a patient**

T. Duman^a, H. Kurucu^b, D. Uluduz^b. ^aNeurology Department, Mustafa Kemal University, Hatay, Turkey; ^bNeurology Department, Istanbul University Cerrahpasa School of Medicine, Istanbul, Turkey

Background: Childhood periodic syndromes that are assumed to be related with migraine are commonly encountered but under-recognized conditions. They occur as periodic and paroxysmal attacks mimicking other vestibular or intracranial pathologies, but with complete remissions between episodes. Though periodic syndromes may lead to migraine headaches in adulthood, they may usually present without a headache component. They are rarely recognized to be transforming into each other.

Case: A three year-old girl referred to our out-patient clinic with a 2 year history of severe vertigo attacks recurring once or twice a month and newly onset headache attacks. Vertigo attacks were started at age 13 months, they are intense for minutes repeatedly, lasting three or five

days, accompanied by frightening, nausea and rare vomiting. She was also complaining headaches for 5 months occasionally during vertigo attacks. She had a normal developmental background in perinatal period and early infancy. Her detailed history revealed periodic episodes of irritability, pallor and head-tilt to the left side lasting about 24 hours, recurring once a month during first year of infancy. The clinical feature was consistent with a diagnosis of benign paroxysmal torticollis evolving into benign paroxysmal vertigo at age 13 months and accompanied with occasionally probable migraine attacks started at age 2.5 years. Family history revealed that her mother has migraine attacks. Detailed investigations were done. She was successfully treated with cyproheptadine and remains attack-free for 4 months.

Discussion: Childhood periodic syndromes are thought to be early life expressions of genes that later in life are expressed as migraine headache. There is often also a positive family history of migraine. Periodic syndromes possess a particular importance of being recognized and treated in order to prevent shading into migraine headaches in following years.

doi:10.1016/j.jns.2015.08.560

488

WFN15-0532

Headache**A survey on comorbidities of migraine in a hospital-based population**

M. Gedizlioglu, O. Onder, C.A. Kulan, P. Ortan. Department of Neurology, Izmir Bozyaka Research and Training Hospital, Izmir, Turkey

Background: Migraine often appears associated with various diseases. The success of treatment will improve by taking care of such comorbidities.

Objective: To evaluate the existence of comorbid diseases in a group of migraineurs registered in our out-patient clinic.

Method: We applied a questionnaire inquiring comorbid diseases to the migraine patients and a group of control subjects. A family history of migraine, level of education, smoking and socio-cultural level were particularly asked together with the history of sinusitis, tension headache, psychiatric diseases, allergies, gastrointestinal, cardiovascular, urologic, respiratory and rheumatologic diseases. The data of the two groups were statistically compared using chi-square and logistic regression analyses.

Results: One hundred forty-two migraine patients diagnosed according to IHS criteria had responded the questionnaire as well as 265 age and gender matched control subjects. The mean ages were 41.1 ± 10.7 (17–69) and 39.6 ± 10.5 (18–68) years for the migraineurs and controls, respectively. The majority of patients in both groups were females. The educational level of the migraine patients was meaningfully low ($p = 0.0007$). The statistical comparison for comorbid states revealed a significant difference only for sinusitis being higher in the migraine group ($p < 0.0001$).

Conclusion: In this study, we evaluated some previously reported associations in our migraine out-patient population. We could not find any association except with sinusitis. However, depression was very frequent in both migraine and control groups. With that, depression must be specifically taken into account in the treatment of migraine. As sinusitis is one of commonest causes of headache, its detection and treatment carries a particular importance.

doi:10.1016/j.jns.2015.08.561

489
WFN15-1372

Headache
Facial diplegia complicating fever of dengue

S. gomes. neurology, b.portuguesa, Sao Paulo, Brazil

FACIAL DIPLEGIA COMPLICATING FEVER OF DENGUE

Introduction: Dengue is the most frequent human arboviral infection, the symptoms depends on the clinical form, ranging from headache to a large number of symptoms including neurologic manifestations.

Objective: to report a case of dengue with neurologic manifestations.

Case report: 35 years old man presents sudden severe headache, fever, severe myalgia, and diffuse paresthesias. He was hospitalized and after ten days of symptomatic treatment and positive serological test for dengue evolves with diffuse paresthesias, paresis global with crural predominance, dysphagia, dysphonia, diplegia facial. Electro-myography with bilateral peripheral facial palsy, cerebrospinal fluid examination with mild pleocytosis, and in serologies positivity in specific IgM titers to dengue.

Discussion: Bilateral simultaneous facial paralysis is rare clinical entity, association with dengue is rarer. Diagnosis workup for a patient presenting with bilateral facial paralysis depends upon the history. The history should include time sequence of onset, prior history of facial paralysis, recent viral or upper respiratory tract infection, recent camping or hiking, ontological symptoms, change in taste, facial numbness, vesicles, or recent immunization.

doi:10.1016/j.jns.2015.08.562

490
WFN15-1373

Headache
Refractory cluster headache

S. gomes. Department of Neurology, B.Portuguesa, Sao Paulo, Brazil

Introduction: Cluster headache is classified as unilateral primary headache characterized by intense pain associated with ipsilateral autonomic symptoms. Typically it occurs with short periods of crises, called clusters. It is included in the group of trigeminal autonomic headache. It affects 0.1 to 0.4% of the population, being more prevalent in men in the ratio of 3:1 compared to women. Report atypical and refractory to drug treatment table with various therapeutic attempts to neurosurgical approach of a case of cluster headache. Clinical case men, white, 55 years, hypertension, bearer of cluster headache, with daily recurrent pain crises, initially with five daily episodes, lasting 30–240 min. Continuous intense pain on periorbital region to the left associated with conjunctival hyperemia, eyelid ptosis and ipsilateral hyaline rhinorrhea. Significant pain relief with oxygen. Already in use of Topiramate 150 mg/day, Verapamil 240 mg/day, Prednisone 30 mg/day, in addition to naproxen and Tramadol. Admitted for pain control, had cardiac contraindication to increasing the dose of Verapamil due to risk of AVB. Despite the adjustment Lithium 300 to 600 mg/day and increased to Topiramate 200 mg/day, held 10 and 25 episodes per day with an average duration of 20–80 min. There was no clinical response to a therapeutic trial with Indomethacin 150 mg/day. After 04 months of clinical treatment without success and on the refractory and incapacitating nature of pain, we opted for neurosurgical intervention. Performed Gasserian Trigeminal ganglion balloon compression rhizotomy of V1 and V2 roots to the left. In the immediate post-operative patient developed left facial anesthesia without new episodes of pain. After three months remained with significant improvement in pain intensity.

Discussion: Chronic cluster headache occurs in less than 8 a 10% of cases. The rhizotomy of the trigeminal nerve compression with Fogarty balloon. The literature describes a frequency of 83% relief of at least 53% pain after the procedure. In the long term the rate drops to about 50% of cases.

doi:10.1016/j.jns.2015.08.563

491
WFN15-1374

Headache
Idiopathic intracranial hypertension, a cause of vision loss

S. gomes. neurology, b.portuguesa, Sao Paulo, Brazil

Introduction: Idiopathic intracranial hypertension (IIH) is a syndrome of increased intracranial pressure without ventriculomegaly or expansive lesion, with normal cerebrospinal fluid (CSF) composition and unidentified cause. It can lead to severe visual impairment, due to progressive retinal nerve fiber layer loss or retinal vascular occlusion. The annual incidence per 100,000 persons of general population is 1, being 20 times higher in young and overweight women.

Case report: A 49-year-old female, smoker, BMI of 39 kg/m², with a history of migraine, was admitted to the hospital complaining of severe left hemicranial headache, nausea, vomiting, visual blurring, bilateral tinnitus and fever (temperature was 39.5 °C). Lumbar puncture was performed, with opening pressure of 350 mmH₂O, taken out 4 mL of cerebrospinal fluid, and closed at 210 mmH₂O. CSF exam showed normal values. Cranial computed tomography (CT) Scan, magnetic resonance imaging (MRI) and retinography findings was normal. Patient diagnosed with IIH and acute otitis. Initiated treatment with acetazolamide, 600 mg every 6 hours, dexamethasone and antibiotic. Advised to lose weight and stop smoking. Patient returns with worsening of vision and headache. Campimetry indicated decrease in general sensibility with loss of tubular field in both eyes. Patient was submitted to lumboperitoneal shunt. No more symptoms reported after the procedure.

Discussion: The diagnosis of IIH is based on the clinical presentation and evolution of the syndrome, and mainly in laboratorial exams and image diagnostic. It is essential to perform the differential diagnosis, since the syndrome is a diagnosis of exclusion. The pathophysiology of IHH is not completely understood. The most accepted mechanism is that IIH results from decreased absorption of CSF, confirmed by slowed circulation of CSF shown by isotope cisternography. Pharmacological treatment of IIH is performed with acetazolamide in order to reduce the production of CSF. When there is progressive visual loss, even with maximum medical therapy, it is indicated surgical treatment with optic nerve sheath fenestration or lumboperitoneal shunt.

doi:10.1016/j.jns.2015.08.564

492
WFN15-0396

Headache
Incidence of migraine and other headache in a neurology OPD clinic in a South Indian superspeciality hospital by a general neurologist

S. Jaiswal. Dept. of Neurology, Care Institute of Medical Sciences, Hyderabad, India

Objective: To highlight recent trend of incidences and prevalence of Migraine and other Headache disorders in a Private Hospital in India

Background: India as a second populous country in world has a high burden of Headache patients. Data collection from private institutes with recent trends will help in defining characteristics of Headache disorders in Asian population,

Methods: In my General Neurology OPD, I've collected data of all patients visited to me.

From 1st May, 2014 to 30th Apr, 2015, during 12 months of duration, total 1389 neurology patients consulted to me in General Neurology OPD.

Results: Total 307 patients of Headache consulted to me during 12 months of duration among 1389 OPD patients.

Details of all these patients are shown in Table 1

Others types included TACs(2), Catamenial(2), Orgasmic(1), IHH(2), CSVT(2), Depression(3), Calcified Granuloma(3), Glaucoma(1), Sinusitis(4), Metastasis(1), Meningitis(2), Aqueductal stenosis(1), Glioma(1), Alcohol(1), Status Migrainous(1).

Conclusions: In my short duration observational studies in General Neurology OPD, different types of Migraine (193) have the highest incidences, followed by Tension Type Headache/TTH (42), as expected from other epidemiological studies.

Limitation of my study is a short duration and single person observational study, but likely to continue this project for longer duration with more conclusive data.

Type of Headache	Total no. of Patients	Sex(M/F)	Age(years)
Migraine without aura	154	32/122	12-59
Migraine with aura	31	05/26	20-59
Vertiginous Migraine	08	01/07	23-61
TTH	42	26/16	20-76
Post Traumatic	06	05/01	09-48
Post Stroke	06	02/04	16-74
Drugs induced	03	00/03	23-30
Others	27	08/19	16-70
Undefined	30	09/21	11-72

doi:10.1016/j.jns.2015.08.565

493

WFN15-1407

Headache

Onabotulinumtoxin A in chronic refractory migraine: a pilot study

A. Bartkova^a, P. Otruba^a, V. Sladkova^a, J. Zapletalova^b, P. Hlustik^a, P. Kanovsky^a. ^aDepartment of Neurology Faculty of Medicine and Dentistry, Palacky University, Olomouc, Czech Republic; ^bDepartment of Medical Biophysics Faculty of Medicine and Dentistry Institute of Molecular and Translational Medicine, Palacky University, Olomouc, Czech Republic

Background: Chronic migraine (CM) is a prevalent and disabling neurological disease. The approval of Onabotulinumtoxin A provides a promising and specific therapeutic option in the pharmacoresistant patients.

Objective: To evaluate the feasibility, efficacy and tolerability of Onabotulinumtoxin A prophylaxis in CM in an academic headache clinic.

Patients and methods: Study group included 58 patients with CM (38 women; age 22-71, median 48.0, SD 12.1), median Migraine Disability Assessment (MIDAS) 45.0, 60.8% with medication overuse. 100-150 IU of Onabotulinumtoxin A were injected in 21-31 points over the facial, pericranial and neck muscles, every 12-weeks for up

2 cycles, according to a modified Phase 3 Research Evaluating Migraine Prophylaxis Therapy (PREEMPT) protocol.

Clinical assessments before and after each treatment cycle included: MIDAS, Headache Impact Test 6 (HIT6), Visual Analog Scale (VAS), number of migraine days and data regarding drug intake recorded from patients headache diaries.

Results: Median HIT 6 score decreased from 64 to 56 to 54 points, $p < 0.0001$. Median number of headache days decreased from 20 to 11 to 10 days per month, $p < 0.0001$, median of a 50% or greater reduction in headache days was 42 (47)%. Acute medication decreased from median 26 to 10 to 8 pills per month ($p < 0.0001$). 50% or greater analgesics reduction was found in 60.7 (79.5)% of patients. Patients' subjective evaluation revealed average improvement by 43%.

Adverse events were rare and clinically non-significant.

Conclusions: Onabotulinumtoxin A effectively reduced investigated clinical parameters in chronic migraine. The treatment was feasible and very well tolerated.

doi:10.1016/j.jns.2015.08.566

494

WFN15-0656

Headache

Reversible cerebral vasoconstriction in migraine headaches

T. Kherkheulidze^a, M. Beridze^b, M. Alpaizze^c. ^aNeurology/Neurosurgery, Tbilisi state medical University. HTMC Clinic/Emergency Neurological Clinic, Tbilisi, Georgia; ^bNeurology, Tbilisi state medical University, Tbilisi, Georgia; ^cNeurology/Neurosonology, Tbilisi state medical University, Tbilisi, Georgia

Reversible cerebral vasoconstriction syndrome (RCVS) is relatively new finding and can be detected in Migraine Headache patients as well.

Aim: Study aimed at detection and evaluation of RCVS in Migraine Headache.

Patients and Methods: Totally 48 migraine, female patients, aged 18 to 60 years, with 1-2 attacks per month had been investigated. Control consisted with 15 healthy persons. Patients and control underwent the ultrasound investigations during 2 months. Patients were researched 2 times per month during headache attack and interictal period as well. Controls researched 1 time per month. Sonography examinations performed using Transcranial Dopplerography (TCD) and Transcranial Color-Coded Duplex Sonography (TCCD) methods. Data were calculated by nonparametric Binomial test.

Results: In Migraine patients no correlation was found between site and side of pain and pain intensity. Vasospasm was revealed during severe headache attacks and in interictal period as well in 65% of patients. In these patients the mean flow velocity (MFV) in carotid siphons' (CS) was 74.2 ± 11.8 cm/sec, MFV in middle cerebral arteries' (MCA) amounted 116.4 ± 22.7 cm/sec, MFV in anterior cerebral arteries' (ACA) amounted 101.6 ± 12.8 , MFV in Basilar Artery (BA)- amounted 72.6 ± 16.2 , averaged Lindegaard Index (LI) was 2.9 ± 0.7 and revealed vasospasm as compared to controls: MFV (MCA) amounted 62.2 ± 8.4 cm/sec, LI (2.1 ± 0.3), $p < 0.001$; The MCA was involved in 18.9% of patients, the ACA- in 12.8%, the PCA- in 28.1% and the BAS- in 40.2% of migraine patients.

Conclusion: Present study showed that vasospasm in migraine headaches is more determined to posterior circulation.

doi:10.1016/j.jns.2015.08.567

495
WFN15-0748

Headache

Chiari I malformation – the aims of neurosurgical treatment and postoperative outcome

N. Koruga^a, A. Soldo Koruga^b, D. Stimac^a, I. Hecimovic^a, S. Butkovic Soldo^b, J. Paladino^c. ^aDepartment of Neurosurgery, Clinical Hospital Center Osijek, Osijek, Croatia; ^bDepartment of Neurology, Clinical Hospital Center Osijek, Osijek, Croatia; ^cDepartment of Neurosurgery, University Hospital Center Zagreb, Zagreb, Croatia

Background: Chiari I malformation in adults emerge from craniocephalic disproportion and tonsillar ectopia. Overcrowded posterior fossa compartment and accompanying tonsillar valve effect cause intracranial hypertension and subsequent symptoms.

Objective: To present clinical outcome in surgically treated patients. The most common clinical findings in patients were headache and neck or shoulder pain, vertigo, ataxia, brachial pain and paresthesias.

Patients and methods: All of patients underwent a neurosurgical treatment in prone or sitting position in a regular fashion, which included suboccipital craniectomy, C I / C II laminectomy, “Y” – shaped dural incision, arachnoid opening and enlargement duroplasty. Authors also performed tonsillectomy with large opening of the fourth ventricle and careful preservation of both PICAs, when needed.

Results: Preoperative clinical symptoms slowly resolved after surgery. A cerebrospinal fluid (CSF) leak tends to be the most common postoperative complication which was successfully resolved. All of patients underwent physical rehabilitation under surveillance of physical therapist in an early postoperative period and proceeded with further physical rehabilitation as recommended after discharge from Department. Postoperative radiologic follow-up scans revealed visible CSF spaces and syrinx regression.

Conclusion: Posterior fossa decompression and CSF flow re-establishment following by an extensive postoperative physical rehabilitation provide a good outcome in patients suffered from Chiari I malformation.

doi:10.1016/j.jns.2015.08.568

496
WFN15-1474

Headache

IV ventricle cyst and cluster headache

I. Levy. *Neurology, Neuroscience Spine and Assoc, Naples, USA*

Background: The relationship between structural lesions and cluster headache remains a controversial issue. Symptomatic cases have shown resolution of headache after treatment of underlying mass. MRI brain in routine cluster headache patients has not been recommended.

Objectives: To describe a 24-year old man with recurrent cluster headaches. Patient has met the International Classification of Headache Disorders criteria for cluster headaches. Patient responded to injectable sumatriptan and oxygen therapy. MRI brain revealed presence of a IV ventricle cyst with mild capsular enhancement.

Discussion: Cases of symptomatic cluster headache particularly pituitary lesions are described in the literature. Most symptomatic cases have been reported in late-onset patients.

We suggest that contrast-enhanced MRI should be considered in early onset classic cluster headaches as well.

doi:10.1016/j.jns.2015.08.569

497
WFN15-1000

Headache

Giant cell arteritis with coronary complications

R. Mendes Silva, A. Bueno Carvalho, G. Saraiva, G. Santana de Lima, J. Pedro Piretti, M. Alexandre Diniz Carneiro, F. Moraes Cardoso Marques, A. Victor do Carmo Faria, T. Alexandrino Gonçalves Jube Ribeiro, D. Sisterolli Diniz. *Neurology, University Federal of Goias, Goiânia, Brazil*

Background: Giant cell arteritis (GCA) is a systemic immune-mediated chronic granulomatous vasculitis affecting arteries of large and medium caliber.

Objective: Report a case of GCA with coronary artery involvement likely that evolved into sudden death.

Patients and methods / material and methods: Male patient, 81, sought the neurology service of HC/UFG for headache and behavioral changes. One year ago started with recurrent frontotemporal headaches of moderate or strong intensity accompanied by verbal aggression, loss of appetite and worsened after 9 months with visual hallucinations. One month ago presented with progressive vision loss and bilateral temporal artery tenderness to palpation. Evidence of altered inflammatory activity and cranial MRI showed thickening of the extracranial arteries. Suspicion of GCA, the temporal artery biopsy was performed and pulse therapy with methylprednisolone prescribed for 5 days, with a significant improvement of cognition mainly, but not full of visual symptoms of the patient. After two days of finished pulse therapy, the patient evolved to cardiopulmonary arrest and sudden death. Necropsy proved a coronary infarct. The artery biopsy confirmed the diagnose of GCA.

Results: We report a case of Giant Cell Arteritis evolving to myocardial infarction.

Conclusion: The diagnostic criteria of GCA supported by American College of Rheumatology are: Age > 50 years; New onset cefalalgia; Temporal artery abnormalities; VHS > 50 mm/h; Altered arterial biopsy. Although coronary is not a commonly affected artery, the patient presented with all criteria for the disease and realized treatment in accordance with the current practice, but evolved to death.

doi:10.1016/j.jns.2015.08.570

498
WFN15-0806

Headache

Thunderclap headache prevalence and modification of preexisting headache patterns after endovascular embolization in patients with ruptured intracranial aneurysm

B.B. Esmanhotto, E.J. Piovesan, F.A. Moreschi, E. Cassou dos Santos, G.L. Oliveira Salvador, M.C. Lange. *Division of Neurology Department of Internal Medicine, Federal University of Parana, Curitiba, Brazil*

Background: Thunderclap Headache (TH) is a common symptom of onset of a Ruptured Intracranial Aneurysm (RICA), which is reported by almost 60% of patients. However, pain evolution course and modifications of preexisting primary headaches after aneurysm endovascular embolization are not well-described patterns.

Objective: Our aim is to analyze the prevalence of TH as a symptom of a RICA and evaluate pattern modification of pre-existing headaches 3, 6 and 12 months after the endovascular embolization.

Material and Methods: Prospective analysis was performed with 60 patients from a Brazilian university hospital who were submitted to endovascular embolization due to a RICA between 2013 and 2014.

The analysis consisted of interviews regarding preexisting headaches, headache presence and its characterization at RICA onset, 3, 6 and 12 months after endovascular treatment. Institutional Review Board approval was obtained, as necessary.

Results: 31 patients (51.6%) referred TH as an onset symptom of a RICA. The frequency of preexisting headache pain episodes was reduced in the comparison analysis between third and sixth months ($p < 0.003$) and between sixth and twelfth months ($p < 0.001$) after endovascular coiling embolization.

Conclusion: Though literature data shows a high specificity of TH for RICA diagnosis, our study found it to be less sensitive as a marker of RICA (in accordance with description made by previous studies). There might be a relation between endovascular embolization of intracranial aneurysms and pain frequency reduction of preexisting headaches. Other types of pattern changes of preexisting headaches were not significant.

doi:10.1016/j.jns.2015.08.571

499

WFN15-0815

Headache

Benign intracranial hypertension associated to portal hypertension: a case report and review of the literature

E.J. Piovesan, F.A. Moreschi, G.L. Oliveira Salvador, E. Cassou dos Santos, T.H. Roza. *Division of Neurology Department of Internal Medicine, Federal University of Parana, Curitiba, Brazil*

Background: Portal hypertension is responsible for many clinical manifestations such as gastrointestinal bleeding and ascites. Benign intracranial hypertension is an uncommon described complication associated with portal hypertension in the absence of hepatic acute or chronic disease.

Objective: This report describes a case of a benign intracranial hypertension in a patient with portal hypertension and performs a review of the literature.

Patients and Methods: A 37-years-old woman referring a 20-day history of diffuse compressive headache (VSA 7), worsened by head flexion, and tinnitus. Photopsia, nausea and vomiting were absent. Neurological examination showed bilateral (symmetric) papilledema. There were no signs of impairment of other cranial nerves. We have obtained patient approval, as necessary.

Results: CSF lumbar puncture showed elevated opening pressure (520cmH₂O). CSF cytochemical analysis were normal. Liver function tests were also normal. Cranial MRI did not show abnormalities. Acetazolamide 250 mg was instituted, without improvement after 4 months of therapy. The patient had upper gastrointestinal bleeding due to esophageal varices, confirmed by endoscopy. MRA showed portal, splenic and mesenteric venous thrombosis. Warfarin sodium therapy was instituted and an INR of 2.5 was maintained. Acetazolamide therapy was interrupted. After 30 days of anticoagulation, headache improvement and papilledema regression were noticed, concomitantly to the resolution of venous thrombosis.

Conclusion: Association between portal hypertension and benign intracranial hypertension is not commonly described. It might be due to lack of monitoring of intracranial pressure in patients with portal hypertension. This case shows the necessity of investigation of portal hypertension in patients with benign intracranial hypertension.

doi:10.1016/j.jns.2015.08.572

500

WFN15-0848

Headache

Cypriot headache survey: a pilot study of headache prevalence and comorbidities in Cyprus

S. Sahai Srivastava, C. Ugurlu, C. Christie, A. Arakelyan. *Neurology, University of Southern California, Los Angeles, USA*

Background: Cyprus is an island country in the Eastern Mediterranean Sea which is divided into Greek and Turkish Cypriots with no data on headache, depression or anxiety. Headache surveys in neighboring Turkey report 43-71% headache prevalence.

Objective: To study headache prevalence and comorbidities in Cyprus.

Methods: We conducted an interview based study of 399 random participants ages 14-57 and collected demographic information, Headache Impact Test (HIT-6), Generalized Anxiety Disorder (GAD-7) and Patient Health Questionnaire (PHQ-9) in Turkish language in the city of Morphu. We have obtained patient approval, as necessary.

Results: Our cohort included 399 participants (175 adults and 224 adolescent) with slightly higher (54%) female ratio. Average age was 24.7 years (range 14-57). 40% of participants reported headaches and were given additional surveys. Among the adults 66(38%) adults had headaches, the majority were 44(67%) female, with at least high school education 103(59%). Average HIT-6 score for adult participants with headaches was 55.6, which indicated some impact on daily activity due to the headache. Average PHQ-9 score was 7.3 which indicated mild depression and average GAD-7 score was 6.2 indicating mild anxiety. Among the adolescents, 42% had headaches with a significant majority being female (66%, $p = 0.009$). Headache impact was significantly higher in adolescent females (HIT-6, 56.6) ($p = 0.005$) than males (HIT-6, 51.7).

Conclusion: Headache is common in Cyprus in both adults and adolescents. Among adolescents, there may be a significantly higher prevalence of headache among females, who report more impact on daily life compared to adolescent males. Larger studies need to confirm these findings.

doi:10.1016/j.jns.2015.08.573

501

WFN15-0676

Headache

Benign paroxysmal positional vertigo increases the risk of migraine: a population-based study

I.A. Shih^{a,b}, C.H. Hung^a. *^aDepartment of Neurology, Chang Bing Show-Chwan Memorial Hospital, Changhua County, Taiwan; ^bDepartment of Public Health, China Medical University, Taichung City, Taiwan*

Background: Different cranial nerve involvements of migraine were noted in recent population-based study.

Objective: To investigate the association between benign paroxysmal positional vertigo (BPPV) and migraine.

Method: The retrospect cohort study was conducted using data from the Taiwan National Health Insurance Research Database. The study cohort consisted of patients who were newly-diagnosed with BPPV from 2000-2010. An age- and gender-matched comparison group that excluded patients with a diagnosis of BPPV was selected. All cases were followed up from January 1, 2000, to December 31, 2010, death, or occurrence of migraine event. The demographic characteristics and medical comorbidities in both

groups were investigated using student's t test and chi-square test. Cox proportional hazards regression analysis was used to estimate hazard ratio for migraine in BPPV cohort compared to the control group.

Results During the 12-year follow-up period, 387 of the 6243 subjects with BPPV and 526 of the 24972 subjected without BPPV developed migraine. The crude hazard ratio of BPPV for migraine is 2.98. After adjustment of demographic state and comorbidities, the adjusted hazard ratio is 2.7-fold higher than the risk among those without BPPV (confidence interval: 2.36-3.09, $p < 0.001$). BPPV remained independently associated with a higher risk of migraine after subgroup analysis.

Conclusion: Benign paroxysmal vertigo of childhood is previously thought to be a migraine precursor in children. The study found the association between BPPV and migraine among all age groups. The association is supported with recent genetic study on vestibulopathy and migraine.

doi:10.1016/j.jns.2015.08.574

502

WFN15-0549

Headache

The effects of continuous theta burst transcranial magnetic stimulation in migraine patients

M. Colak-Atmaca, M.A. Aldan, B. Ciftci-Kavaklioglu, G. Gul, N. Karagoz-Sakalli, M. Ozerden, A. Soysal. *Neurology Department, Bakirkoy Training and Research Hospital for Psychiatry Neurology & Neurosurgery, Istanbul, Turkey*

Background: Theta burst stimulation (TBS) is a form of repetitive transcranial magnetic stimulation (rTMS) that has been suggested to induce long-term potentiation/depression (LTP/LTD) on synaptic transmission. Several studies have demonstrated that continuous TBS (cTBS) has inhibitory, and intermittent TBS (iTBS) has excitatory effects on motor evoked potential (MEP) responses.

Objective: To investigate whether cTBS has effects on cortical excitability in migraine patients with and without aura.

Material and methods: Twenty migraine patients (17 females) and 18 healthy volunteers (13 females) were included. First, MEP amplitude, motor threshold (MT), cortical silent period (CSP), intracortical inhibition (ICI) with 2 ms interstimulus interval (ISI) and intracortical facilitation (ICF) with 10 ms ISI were evaluated. Next, cTBS was administered; and ICI, ICF and CSP were studied again.

Results: No significant difference was determined in baseline MEP, CSP and ICI values between migraine patients and healthy controls. However, ICF was significantly lower in migraine patients compared to controls. ICF in response to cTBS was significantly decreased in controls; whereas no difference was observed in migraine patients.

CONCLUSION: Increased cortical excitability is one of the major mechanisms considered in migraine pathogenesis. Lower ICF obtained in migraine patients in this study implies the involvement of intracortical facilitator circuits in migraine pathogenesis. Administration of cTBS, the established inhibitor of ICF in normal individuals, exhibited no change in ICF in migraineurs, suggesting irresponsiveness of the impaired facilitator circuits in migraine. Further studies will be worthwhile to extrapolate these pathogenetic insights into the diagnosis and treatment of migraine patients.

doi:10.1016/j.jns.2015.08.575

503

WFN15-1068

Headache

Spontaneous intracranial hypotension in association with venous sinus thrombosis: a case report

A. Cetiz^a, O. Oz^a, H. Akgun^a, S. Tasdemir^b, B. Battal^c, M. Yucel^a, U. Ulas^a, S. Demirkaya^a. ^aDepartment of Neurology, Gulhane Military Medical Academy, ANKARA, Turkey; ^bDepartment of Neurology, Beytepe Military Hospital, ANKARA, Turkey; ^cDepartment of Radiology, Gulhane Military Medical Academy, ANKARA, Turkey

Background: Spontaneous intracranial hypotension (SIH) is a disease characterized by orthostatic headache, low cerebrospinal fluid (CSF) opening pressure, and gadolinium enhancement of pachymeningeal on MRI.

Objective: Cerebral venous sinus thrombosis (CVT) in patients with intracranial hypotension is rare

We present a case of spontaneous intracranial hypotension associated with venous sinus thrombosis.

Patient-Method: A 39-year-old male presented with a double-sided throbbing headache which was alleviated upon standing. Neurological examination was normal except left hand clumsiness. In computerized tomography, a hypodense lesion was observed in the right aspect of parietal lobe. There was hyperdensity in the center of this area, suggesting hemorrhagic venous infarction. Superior sagittal sinus thrombosis showing elongation to the confluence of the sinuses was identified via MRI venography. Pachymeningeal thickening and enhancement was observed in MRI, suggesting intracranial hypotension. Hematological parameters were as follows proteinC: 149.7%(70-140), proteinS: 49.3%(60-130), Factor8: 197.4%(70-150). Genetic analysis found factorV and MTHFR to be heterozygous. When clinical and radiological findings were evaluated together, CVT secondary to SIH was diagnosed. Anticoagulant and analgesic therapy was given. An isotonic solution was administered parenterally.

Result: After 1 week, the patient's complaints resolved completely. In the follow-up MRI, recanalization of the thrombosed sinus was observed.

Conclusion: SIH is a risk factor for CVT. In this report, it is noteworthy that mutations of factorV Leiden and MTHFR gene are additional risk factors, as are diabetes and hyperlipidemia. Among SIH and VST patients in the literature, 2 cases involved additional risk factors: a prothrombin gene mutation in one case, the presence of abnormal protein C1 in the other. SIH and CVT rarely coexist, so we found it valuable to present this case.

doi:10.1016/j.jns.2015.08.576

504

WFN15-0265

Headache

Contribution of intrinsically photosensitive retinal ganglion cells in the photophobia of migraine patients

M. Tatsumoto^a, M. Yamakawa^b, K. Okajima^c, K. Hirata^a. ^aNeurology, Dokkyo Medical University, Tochigi, Japan; ^bGraduate School of Environment and Information Sciences, Yokohama National University, Yokohama, Japan; ^cFaculty of Environment and Information Sciences, Yokohama National University, Yokohama, Japan

Background: It has been reported that the intrinsically photosensitive retinal ganglion cells (ipRGCs) are involved with migraine headache caused by the photophobia, based on a research in which

photosensitive tests induced headache attacks in migraine patients with damaged cones/rods and normal ipRGCs.

Aim: This study aimed to elucidate the effect of ipRGCs in photosensitivity experiences of migraine patients with normal vision.

Method: The subjects were 30 migraine patients and 30 normal controls. The subjects rated the discomfort of the glare under four kinds of light source condition. Stimulations from light source 1 (LS-1) for S, M, L cones, and ipRGCs were each defined as 100 each and those from the other light sources were calibrated relative to LS-1: for LS-2 and LS-3, ipRGCs stimulations were set at 80 and 62; and for LS-4, cone stimulations were set differently from LS-1 (S: 185, M: 107, L: 95).

Results: No differences were observed in discomfort glare estimation between the migraine group and normal control group for any of the four light sources. Within the migraine group, discomfort glare from LS-4 was higher than that from LS-1 and LS-2 with low luminance.

Conclusion: In migraine patients, no differences were noted in discomfort glare among different levels of ipRGCs stimulation. However, the light sources with higher levels of S-cone stimulation may produce more severe discomfort glare, which indicates that the difference in colors (blue light) might play a critical role in causing discomfort glare.

doi:10.1016/j.jns.2015.08.577

505

WFN15-0773

Headache

Temperament, impulsivity and chronobiology in patients with episodic and chronic migraine

A. Siva^a, D. Uluduz^a, H. Ertem^b, S. Ayan^a, U. Uygunglu^a, B. Goksan^a, S. Saip^a. ^aNeurology, Istanbul University Cerrahpasa School of Medicine, Istanbul, Turkey; ^bAlgology, Istanbul University Cerrahpasa School of Medicine, Istanbul, Turkey

Background: Psychiatric comorbidity in patients with migraine has negative effects on treatment. Although there is a well-established relation between psychiatric disorders and migraine, studies regarding the relation of temperament, circadian rhythm dysregulation and impulsivity with migraine are still lacking.

Objective: To evaluate the effects of temperament differences, chronobiology and impulsivity among episodic and chronic migraine patients.

Methods: The study was performed on 30 episodic and 31 chronic migraine patients and 53 healthy controls. Subjects were administered Morningness-eveningness Questionnaire, Barratt Impulsiveness Scale, Hamilton Depression and Anxiety Rating Scales, Epworth Sleepiness Scale, Pittsburgh Sleep Quality Index and TEMPS-A to measure the temperament. The results were compared with headache frequency and severity.

Results: 25% of patients with chronic migraine, 13% of patients with episodic migraine and 11% of healthy control had eveningness chronotype. 22% of patients with chronic migraine, 33% of patients with episodic migraine and 26% of healthy control had morningness chronotype. Impulsivity scores were significantly higher in migraine groups than control group ($p = 0.05$) but it was not associated with chronification. The cyclothymic temperament was significantly more frequent in patients with chronic migraine ($p = 0.006$). There were no significantly association between headache types, sleep quality and the other temperaments.

Conclusion: Impulsivity in general in migraine and cyclothymic temperament mainly in chronic migraine is significantly more

prominent than healthy controls. Therefore chronobiology, temperament and impulsivity should be evaluated in patients with migraine to apply appropriate treatment strategies.

doi:10.1016/j.jns.2015.08.578

506

WFN15-0521

Headache

Do serum lipid hydroperoxide and free sulfhydryl use for biochemical markers of migraine?

S. Sarikaya^a, S. Ciftci^a, T.K. Yoldas^b, A. Sonmezler^c, M. Calik^d, N. Aksoy^e, M. Yilmaz^a. ^aNeurology, Harran University, Sanliurfa, Turkey; ^bNeurology, Ankara Training and Research Hospital Ministry of Health, ANKARA, Turkey; ^cNeurology, Adana Numune Training and Research Hospital Ministry of Health, Adana, Turkey; ^dPediatric Neurology, Harran University, Sanliurfa, Turkey; ^eClinical Biochemistry, Harran University, Sanliurfa, Turkey

Aim: In this study we aimed to evaluate the serum Lipid Hydroperoxide (LOOH) and Free Sulphydryl (-SH) levels of Common Migraine Patients compared to healthy controls.

Material and methods: This study was conducted as a prospective case-control study. Forty Common Migraine Patients according to the diagnostic criteria of the International Headache Society and fifty two healthy volunteers as controls were included to the study. The participants were informed of the content and conduct of the study and informed consent forms were obtained. Serum samples were collected and were centrifuged. Serum Lipid Hydroperoxide and Free Sulphydryl levels were studied in the same Clinical Biochemistry Laboratory at the same time.

Results: Serum SH levels were statistically decreased in Common Migraine Patients group compared to control group ($P < 0.005$). There was no statistically significant difference in Serum LOOH between patients and the control group ($P > 0.005$). There was a negative correlation between SH and LOOH serum levels.

Conclusion: The data of this study demonstrate decreased serum SH level in Common Migraine. Based on these findings, we suggest that these parameters may be used as biochemical markers for Common Migraine.

doi:10.1016/j.jns.2015.08.579

507

WFN15-0522

Headache

Plasma total antioxidant status, antioxidant status and oxidative stress and their relationship to migraine disease

S. Sarikaya^a, S. Ciftci^a, T.K. Yoldas^b, M. Calik^c, A. Sonmezler^d, N. Aksoy^e, M. Yilmaz^a. ^aNeurology, Harran University, Sanliurfa, Turkey; ^bNeurology, Ankara Training and Research Hospital Ministry of Health, ANKARA, Turkey; ^cPediatric Neurology, Harran University, Sanliurfa, Turkey; ^dNeurology, Adana Numune Training and Research Hospital Ministry of Health, Adana, Turkey; ^eClinical Biochemistry, Harran University, Sanliurfa, Turkey

Background: Many studies have been conducted to study the pathogenesis of migraine disease.

Objective: To evaluate whether plasma Total Oxidant Status (TOS), Antioxidant Status (TAS) and Oxidative Stress Index (OSI) in the form of plasma reactive oxidants differs between patients with

migraine and healthy controls and to investigate associations between plasma antioxidants and Migraine.

Patients and Methods: This study was conducted as a prospective case-control study. Forty Common Migraine Patients according to the diagnostic criteria of the International Headache Society and fifty two healthy volunteers as controls were included to the study. The participants were informed of the content and conduct of the study and informed consent forms were obtained. Serum samples were collected and were centrifuged. Plasma Total Antioxidant Status, Antioxidant Status and Oxidative Stress levels were studied in same Clinical Biochemistry Laboratory at the same time.

Results: TAS levels in migraine patients was significantly decreased compared to control group and statistically significant ($p < 0.005$). There was no statistically significant difference in serum TOS between patients and the control group ($p > 0.005$). OSI levels in migraine patients increased compared to control group markedly and statistically significant ($p < 0.005$).

Conclusion: The vascular endothelial dysfunction has been implicated in the pathogenesis of migraine. The results of this study indicate an increased oxidative stress in migraine. This stress factor may have a role in the pathogenesis of migraine.

doi:10.1016/j.jns.2015.08.580

508

WFN15-0523

Headache

Serum oxidant and antioxidant status of patients with chronic tension type headache: possible effects of medical treatment

B. Gökçe Çokal^a, B. Ayaç^b, Z.E. Durak^c, H.N. Güneş^a, B. Öztürk^d, S. Keskin Güler^a, I. Durak^e, T.K. Yoldas^a. ^aNeurology, Ankara Training and Research Hospital Ministry of Health, ANKARA, Turkey; ^bDirectorate of Health Services, Ministry of Health, ANKARA, Turkey; ^cBiochemistry Laboratory, Public Health Institute of Turkey, ANKARA, Turkey; ^dBiochemistry, Selçuk University Faculty of Medicine, KONYA, Turkey; ^eBiochemistry, Ankara University Faculty of Medicine, ANKARA, Turkey

Background: Tension-type headache (TTH) is one of the most common and costly primary types of headache in clinical practice, with an unknown etiology. TTH is a complex disorder and heterogeneous mechanisms are thought to play a role.

Objective: This study assessed to investigate oxidative and anti-oxidative status in patients with chronic tension type headache (CTTH), and to evaluate possible effect of medical treatment.

Material and Methods: The study included 41 CTTH patients and 19 age- and sex-matched healthy subjects without headache as controls. The CTTH group comprised 20 patients receiving treatment and 21 untreated patients. We evaluated oxidant/antioxidant status by measuring serum malondialdehyde (MDA) levels and activities of antioxidant enzymes, namely glutathione peroxidase (GSH-Px) and catalase (CAT).

Results: Comparison of oxidative parameters in the patient and control groups revealed significantly lower CAT activities and higher MDA level and GSH-Px activities in the patient group. In the CTTH group, serum CAT activities were found to be significantly decreased in patient groups, while serum MDA levels and GSH-Px activities were found to be higher in the untreated CTTH patients.

Conclusion: These findings suggest that oxidative stress is increased in the patients with CTTH, and medical treatment abolishes the stress in part. It has been concluded that antioxidant support might be helpful for the patients with CTTH to prevent oxidant stress and peroxidation damages further.

doi:10.1016/j.jns.2015.08.581

509

WFN15-0778

Headache

Frequency of headache in stroke

N. Zarić, N. Milovanovic-Kovacevic, M. Savic, M. Delic-Miskovic. *neuroimaging, Hospital for cerebrovascular diseases Sveti Sava, Belgrade, Serbia*

Background: Headache is a relatively common symptom associated with various types of stroke. It belongs to symptomatic headaches and is classified in the 6th group IHS classification.

The **aim** of this study was to compare the frequency of the headache in stroke patients depending on sex, age, type of stroke, duration of headache, location and size of the cerebral lesion.

Methods: From January 1 to December 31, 2014, 5,476 stroke patients were admitted in St. Sava Hospital. Out of them, 843 patients were treated, female 402, male 441, mean age 67.9. The patients were studied using the standard protocol including MSCT and MR. The presence of headache was established by taking history from the patients or relatives.

Results: Among these patients, 48.9% had experienced headache, with higher frequency in female (64.3%), less than 70 years old. Frequency of headache in patients with ischemia was 41.6%, and with hemorrhage 50.3%. Headache was most common in patients with cortical lesions (56.7%) and with lesions located in the basilar artery (41.3%). Large lesions (>2 cm) were more frequently followed with headache (62.3% vs. 28%). The average duration of headache in ischaemic stroke was 25 hours compared to 65 hours in haemorrhagic stroke.

Conclusions: Headache was more frequent in females ($P < 0.01$), in patients with hemorrhage ($P < 0.05$), with large ischemic lesions ($P < 0.01$), located in the basilar distribution ($P < 0.05$) and in the cortical area ($P < 0.05$).

doi:10.1016/j.jns.2015.08.582

510

WFN15-0258

Headache

High altitude headaches in climbers of Mount Aconcagua in the Andes Mountain range

A. Marengo^a, L.J. Zavala^b, H.A. Zavala^b, B.B. Saravia^b. ^aNeurology, Hospital Lagomaggiore, Mendoza, Argentina; ^bNeurology, Hospital Ramos Mejia, Buenos Aires, Argentina

Background: High altitude headache is the most common complaint among climbers.

Objective: Features of high altitude headache, correlating it with acute mountain sickness and alterations in hematocrit in climbers of Mount Aconcagua, Mendoza, Argentina.

Patients and Methods: A cross-sectional, descriptive, observational and correlative analysis of Mount Aconcagua climbers was conducted during 2013.

Individuals were classified into two groups: climbers suffering from high altitude headache (CA) or not (NCA).

Anamnesis, neurological examination, ophthalmoscopy, measurement of vital parameters and hematocrit were performed at different heights H1: 3300 m; H2: 4370 msnm, H3: 5050 msnm, H4: 5570 msnm + 5935 msnm. The Lake Louise Scale was used to assess the severity of Acute Mountain Sickness.

Results: Of 160 people, 30 were excluded; 53 suffered from CA and 77 did not suffer from CA (NCA). The CA group had a mean age of 37 ± 9 years ($p = 0.02$). The days spent in Mount Aconcagua in the CA group was 7 ± 4 days and in the NCA group it was

37 ± 14 days ($p < 0.01$). Regarding vital signs, the average heart rate ($p = 0.177$) showed no statistically significant differences ($p = 0.177$); but it did so in O₂ saturation, hematocrit, neurological examination and fundus ($p < 0.01$) between both groups. There was a positive association between acute mountain sickness severity and height (Kendall Tau B = 0.424).

Conclusions: The existing relationship among different heights and high altitude headache, mountain sickness, neurological disorders

and hematocrit was confirmed. Science Committee of Hospital Lagomaggiore intervened.

doi:[10.1016/j.jns.2015.08.583](https://doi.org/10.1016/j.jns.2015.08.583)
