Fig. 1 (abstract P60). See text for description.

P61

Diagnostic utility of T2*-weighted GRE in migraine with aura attack. The cortical veins sign

C. Hirtz[1], A. Viguier[2]
[1]CHU Timone, Neurology, Marseille, France; [2]Toulouse Hospital - Purpan, Toulouse, France
Correspondence: C. Hirtz
The Journal of Headache and Pain 2022, **23(Suppl 1):**P61

Objective: To evaluate the frequency, distribution, and clinical associations of the dilated appearance of cerebral cortical veins, termed cortical veins sign on T2*-weighted gradient recalled-echo (T2*-GRE) in the acute setting of migraine with aura attack in adult patients.
Methods: We conducted a retrospective analysis of 60 consecutive patients admitted for acute neurological symptoms with a final diagnosis of migraine with aura (42%) or probable migraine with aura (58%) who underwent emergency brain magnetic resonance imaging and 60 non-migrainous control adults. The cortical veins sign was defined as a marked hypointensity and/or an apparent increased diameter of at least one cortical vein. We examined the prevalence, the spatial distribution, and the associations of cortical veins sign with clinical characteristics of migraine with aura.
Results: We detected the cortical veins sign in 25 patients (42%) with migraine with aura, compared to none in the control group ($p < 0.0001$). The spatial distribution of cortical veins sign was characterised by the predominantly bilateral and posterior location. Presence of cortical veins sign was associated with increased severity of aura ($p = 0.05$), and shorter delay to MRI ($p = 0.02$).
Conclusion: In the setting of acute neurological symptoms, the presence of cortical veins sign is frequent in patients with migraine with aura and can be detected with good reliability. This imaging marker may help clinicians identify underlying migraine with aura.

Table 1 (abstract P61). Clinical characteristics of the entire migraine aura (MA) group and acording to the presence of the cortical veins sign (CVS). Statistically significant results in bold

	MA group n = 60	CVS n = 25	No CVS n = 35	p
Male, n (%)	18 (30)	11 (44)	7 (20)	**0.05**
Age, mean ± SD	31 ± 10.2	28 ± 9	33 ± 10	0.07
Clinical hemispheric side: left, n (%)	46 (77)	20 (80)	26 (74)	0.61
Aura symptoms, n (%)				
• Sensory	46 (77)	19 (76)	27 (77)	0.92
• Visual	37 (61)	17 (68)	20 (57)	0.39
• Aphasia	30 (50)	16 (64)	14 (40)	0,07
• Motor	9 (15)	6 (24)	3 (8,6)	0.15
Number of symptoms >2	17 (28)	11 (42)	6 (17)	**0.02**
Duration of aura, (min) median ± SD [Q1–Q3]	60 [30–180]	90 [45–240]	45 [30–120]	**0.04**
Delay from aura onset to MRI, (min) median [Q1–Q3]	270 [180–497]	186 [164–300]	354 [210–520]	**0.004**
Delay from end of aura to MRI, (min), median [Q1–Q3]	170 [108–379]	120 [18–200]	256 [160–475]	**0.004**
MRI, n (%)	31 (52)	14 (56)	17 (49)	0.57

P62

Emotional processing differences between migraine and tension-type headache subjects – an fMRI study

D. Dobos[1,2], K. Gecse[1,2], E. Szabo[2,3,4], D. Baksa[1,2], N. Kocsel[2,4], A. Galambos[2,4], T. Zsombok[2], G. Kokonyei[1,2,4], G. Juhasz[1,2]
[1]Semmelweis University, Department of Pharmacodynamics, Budapest, Hungary; [2]Semmelweis University, SE-NAP 2 Genetic Brain Imaging Migraine Research Group, Hungarian Brain Research Program, Budapest, Hungary; [3]Boston Children's Hospital, Harvard Medical School, Center for Pain and the Brain (PAIN Research Group), Department of Anesthesiology, Critical Care and Pain Medicine, Boston, MA, United States; [4]ELTE Eotvos Lorand University, Institute of Psychology, Budapest, Hungary
Correspondence: D. Dobos
The Journal of Headache and Pain 2022, **23(Suppl 1):**P62

Objective: The diagnosis of migraines and tension-type headaches is based on phenotypic characteristics. We currently do not know any marker in the nervous system along which we could separate the two diseases. The emotional processing of migraineurs has been proved to be altered in comparison with that of people without headaches. We wondered whether alterations would also be present when comparing migraineurs to subjects with tension-type headaches.
Methods: 45 episodic migraine (41 females) and 34 episodic tension-type headache subjects (24 females) performed an implicit face emotion processing fMRI task. After preprocessing raw images, individual contrast maps were created and used in a full factorial design to detect between-group differences in association with the average monthly headache frequency. The initial significance threshold was $p<0.001$ but only results surviving family-wise error correction ($p_{FWE}<0.05$) were considered statistically significant. Both preprocessing procedure and statistical analysis of fMRI scans were performed in SPM12.
Results: At the sight of sad faces, migraine subjects showed less activation in the left supplementary motor area compared to tension-type headache subjects in association with the average monthly headache frequency ($p_{FWE}<0.05$, voxel threshold=0).
Conclusion: Although both headache disorders are associated with negative mood, neural responses yielded to a negative emotion were different in migraine and tension-type headache subjects having similar headache frequency. Since the affected cortical region plays a role in emotional processing and cognitive control, we can speculate that the difference in its reaction might contribute to the differences in processing the affective component of pain.

Funding: 2017-1.2.1-NKP-2017-00002; KTIA_NAP_13-2- 2015-0001; 2020-4.1.1.-TKP2020; TKP2021-EGA-25; 2019-2.1.7-ERA-NET-2020-00005, and ÚNKP-20-3-II-SE-51.

P63

Dynamic functional connectivity in migraine during the interictal phase: a resting-state fMRI study

I. Esteves[1], C. Fonseca[1], M. Xavier[1], A. Fouto[1], A. Ruiz-Tagle[1], G. Caetano[1], R. Nunes[1], R. Gil-Gouveia[2,3], J. Cabral[4], I. Pavão Martins[5], A. Rosa[1], P. Figueiredo[1]
[1]ISR-Lisboa and Department of Bioengineering, Instituto Superior Técnico – Universidade de Lisboa, Lisbon, Portugal; [2]Center for Interdisciplinary Research in Health, Universidade Católica Portuguesa, Lisbon, Portugal; [3]Hospital da Luz, Neurology, Lisbon, Portugal; [4]Life and Health Sciences Research Institute, University of Minho, Braga, Portugal; [5]University of Lisbon, Centro de Estudos Egas Moniz e Instituto de Medicina Molecular João Lobo Antunes, Faculty of Medicine, Lisbon, Portugal
Correspondence: I. Esteves
The Journal of Headache and Pain 2022, **23(Suppl 1):**P63

Question: Migraine is a cyclic and complex disorder, characterized by attacks of headache, sensory and cognitive disturbances[1]. Thalamocortical connectivity in migraine has been found to be transiently abnormal[2]. Our aim was to assess if the dynamical properties of the migraine brain are affected during the interictal phase.
Methods: Resting-state functional MRI data was collected from 14 menstrual migraine patients without aura (interictal phase) and 12 healthy controls (menstrual post-ovulation phase). fMRI data processing included[3]: motion and distortion correction, temporal highpass filter, regression of motion and physiological confounds, spatial smoothing, and parcellation with the Desikan atlas. Dynamic functional connectivity (dFC) between regions was computed using phase coherence, and recurrent dFC states were identified by k-means clustering (k ranging between 3 and 15) of the leading eigenvectors of dFC in each time point[4]. Permutation tests were performed to evaluate statistically significant differences between patients and controls in the probability of occurrence and the mean lifetime of the dFC states.
Results: Similar dFC states were found consistently across different numbers of clusters, k, which resembled the canonical resting-state networks as expected. Compared to healthy controls, migraine patients show a significantly lower mean lifetime in one dFC state, when grouping in 4, 5 and 6 clusters. No differences were found for the probability of occurrence.
Conclusions: Migraine may be linked to a disruption of brain networks dynamics. This emphasizes the need to adopt time-resolved methods, in addition to static, to study functional connectivity, to better understand the mechanisms of migraine. Our next step will be to assess the dynamics of the migraine brain throughout the migraine cycle.
1.Goadsby et al., Physiological reviews, 2017
2.Tu et al., Neurology, 2019
3.Jenkinson et al., NeuroImage, 2012
4.Cabral et al., Scientific reports, 2017

P64

Reliable posterior insula–operculum region gray matter volume alterations in vestibular migraine

L. Dong, H. Li, J. Zhou
The First Affiliated Hospital of Chongqing Medical University, Neurology, Chongqing, China
Correspondence: L. Dong and J. Zhou
The Journal of Headache and Pain 2022, **23(Suppl 1):**P64

Question
Vestibular migraine (VM) is one of the most prevalent causes of episodic vertigo. Neuroimaging offers the possibility to investigate and localize the responsive brain areas in patients with VM. Voxel-based morphometry (VBM) has been generally considered as a reliable technique to analyze structural alterations, especially the gray matter volume (GMV) across neurological diseases. Despite all imaging data accumulated on GMV across the past decades, an overview of the imaging evidence of GMV differences in VM is still missing.
Methods
The coordinate based meta-analysis (CBMA) is a novel method to identify consistent and reliable brain alterations among individual neuroimaging studies. This study was performed under the latest algorithm of CBMA, seed-based d mapping with a permutation of subject images (SDM-PSI).
Results
5 studies were included after systemic review (103 patients and 107 healthy controls). Main CBMA showed significantly decreased GMV in the left rolandic operculum (SDM-Z value=-3.68, p=0.004, Voxels=629) with a peak MNI coordinate (-44, -12, 16) located in Brodmann area (BA) 48 and the two largest voxels belonging to the insula and rolandic operculum were consistently reported in VM patients compared to healthy controls. When removing a study with most patients (14/20) had predominantly left-sided headaches in sensitivity analysis, decreased GMV in the right Heschel gyrus (SDM-Z value=-3.83, p=0.003, Voxels=504) with a peak MNI coordinate (48, -12, 8) located in BA 48 was detected, which is symmetrical to the results reported in the main CBMA.
Conclusions
Our CBMA demonstrated the involvement of the posterior insula–operculum region in VM. The lateralization of the headache attack may determine the lateralization of the GMV alteration. Further longitudinal neuroimaging studies are necessary to draw more precise conclusions and the headache side may need to be taken into account when designing migraine-related neuroimaging studies.

P65

Relation of post-stroke headache to cerebrovascular pathology and hemodynamics

E. Abed
Al-Azhar University, Neurology, Cairo, Egypt
The Journal of Headache and Pain 2022, **23(Suppl 1):**P65

Background: Despite the high prevalence of cerebrovascular stroke, headache attributed to ischemic strokes is often undertreated and overlooked. The aim is to detect the relation of a post-stroke headache to cerebrovascular pathology and changes in hemodynamics through a high-resolution duplex ultrasound examination. **Methods:** This is a case-control study that was conducted on 239 patients who presented with an acute ischemic stroke. Patients were subdivided into two groups; Group I included patients with headache attributed to ischemic stroke (cases) and Group II included headache-free stroke patients (controls). History included headache characteristics and risk factors. Clinical and radiological examination were preformed to detect the type of stroke. Ultrasound duplex examination of the extracranial and intracranial cerebrovascular system was carried for both groups. **Results:** Group I included 112 patients (mean age 57.66 ± 6.59 years), Group II included 127 patients (mean age 57.73±7.89 years). Post-stroke headache was more frequent in patients with posterior circulation infarction (58%). Post-stroke headache was reported within 7 days post-stroke in (61.6%) of patients. Pre-stroke headache was an independent predictor for post-stroke headache occurrence (OR=28.187, 95%CI; 6.612-120.158, P<0.001). Collateral opening and various degrees of intracranial vascular stenosis were strong predictors of headache occurrence (OR=25.071, 95% CI; 6.498-96.722, P< 0.001). **Conclusion:** Post-stroke-headache is a common phenomenon especially in patients with pre-stroke headache, history of old stroke, posterior circulation infarction, and large artery disease. This headache was of moderate-intensity with clinical characteristics of tension-type. The intracranial cerebrovascular pathological changes including opening of the collateral channels and variable degrees of stenosis of cerebrovascular systems were implicated in the production of that headache. **Keywords:** Post-stroke headache; cerebrovascular; hemodynamics; duplex ultrasound.

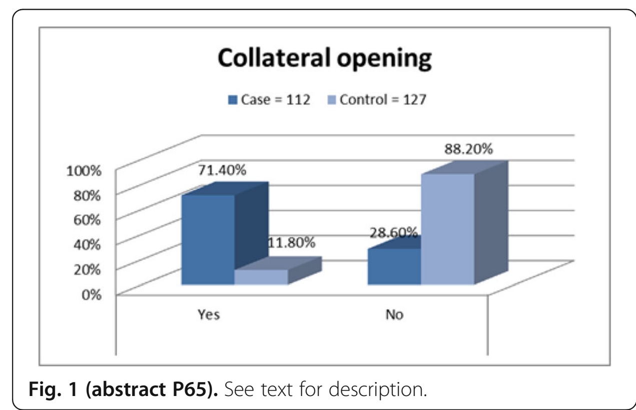

Fig. 1 (abstract P65). See text for description.