

Migraine with aura attacks overriding dreams

Ataques de migrânea com aura sobrepondo sonhos

Kowacs PA^{1,2}, Carneiro RD³, Piovesan EJ¹, Lange MC¹, Santos PSF⁴

¹Neurology Service, Department of Internal Medicine, Clinical Hospital, Universidade Federal do Paraná, Curitiba, PR, Brazil

²Neurology Service, Neurology Institute of Curitiba, PR, Brazil

³Medical student, Universidade Federal do Paraná, Curitiba, PR, Brazil

⁴Medical student, Universidade Federal de Sergipe, Aracaju, SE, Brazil

Kowacs PA, Carneiro RD, Piovesan EJ, Lange MC, Santos PSF. Migraine with aura attacks overriding dreams. *Headache Medicine*. 2011;2(3):96-98

ABSTRACT

While the anatomical pathways involved in migraine with aura are near to be completely known, those involved in dreaming remain less studied. We aimed to describe two cases of migraine with visual aura, whose migraine auras would override their dreams, and to discuss the pathways involved in visual aura and in dreams. The following hypothesis can derive from the above mentioned cases: a) visual aura projects over hippocampal and parahippocampal image templates where they fuse in a unique image; b) memory banks use the extrastriatal occipital cortex to form they image templates, fusion with visual aura occurring during this process; c) both process occur independently, but fuse within visual association areas. The description of case reports like the two above is important to understand the aura phenomenon and the dreaming process and to reinforce the cortical role for these manifestations.

Keywords: Visual aura; Migraine; Dream.

RESUMO

Enquanto as vias anatômicas da migrânea com aura estão perto de ser completamente conhecidas, aquelas relacionadas ao sonho permanecem pouco estudadas. Objetivamos descrever dois casos de migrânea com aura visual, cujas auras enxaquecosas sobrepoem seus sonhos e discutir as vias envolvidas na aura visual e nos sonhos. As seguintes hipóteses podem derivar dos casos acima mencionados: a) aura visual é projetada sobre modelos de imagens hipocampal e parahipocampal, onde elas se fundem em uma única imagem; b) bancos de memória usam o córtex occipital extraestriado para formar modelos de imagens, a fusão com a aura visual ocorre durante este processo; c) ambos os processos ocorrem independentemente, porém fundem-se em áreas de associação

visual. A descrição de relatos de caso como os dois acima é importante para entender o fenômeno aura e o processo do sonho e reforçar o papel cortical para essas manifestações.

Palavras-chave: Aura visual; Migrânea; Sonhos

INTRODUCTION

Anatomy of migraine has been the subject of several studies in the last decades, although migraine is currently considered to be a non-specific response to central nervous system hyperexcitability/dysinhibition states. For migraine with aura, cortical spreading depression (CSD) is the most likely candidate to be the primum phenomenon.¹

Migraine aura is a cortical phenomenon, that usually involves the visual cortex.^{2,3} It usually occurs concomitantly to the input of visual stimuli, it is conceivable that migraine aura and visual input are usually fused.

Nevertheless, migraine aura is known to occur independently from visual stimuli, since it is reported to occur while both eyes are shut or in blind migraineurs.⁴

The occurrence of migraine aura overriding dreams, although not original,⁵⁻⁷ gives an excellent opportunity to speculate about the pathways involved in migraine aura and in dreams. The cases of two patients with migraine with visual aura are reported, whose visual aura symptoms,

if initiated during sleep, would override their dreams, and the pathways possibly involved in visual aura and in dreams are discussed. This study was approved by the Committee for Ethics in Research involving Human Beings of the Neurology Institute of Curitiba (CEP 077/11-0).

CASE REPORTS

Case 1

A 30 year-old caucasian female presented with the complaint of migraine with aura attacks that had started at the age of eight. Her aura always started with blurring of her right hemifield followed by a right hemianopsia lasting two minutes. After the hemianopsia a bright fortification spectra would start in her right inferior quadrant, marching counterclockwise. After a complete turn, its frequency reduced progressively, and it would become dysmorphic and occurring at random. The complete aura used to last 45 minutes. A bilateral throbbing headache, fulfilling all the criteria for migraine, used to follow the aura. Sometimes, while asleep and dreaming, her usual aura would override her dreams imagery. Although she was not able to tell how long her aura lasted before waking up, she would wake up having the same type of migraine attack she used to have while awake. The rest of her medical and family history was unremarkable. Her physical and neurological examinations were normal. She was submitted to a MRI of the head and to an EEG investigation which did not disclosed abnormalities.

Case 2

A 33 year-old caucasian female was seen because of a migraine with visual aura which started at the age of 30 years. Her visual aura consisted of cintillating scotomata at her left visual hemifield, lasting 15 minutes. Her visual aura was followed by a migrainous throbbing headache. Since the beginning, episodes would occur at a frequency of 3-4 a month. Episodes could be triggered by physical efforts and by dreams while asleep linked to specific dream content. Her mother had migraine with aura of the chiro-oral paresthesias. Her MRI of the head was unremarkable.

DISCUSSION

The anatomic pathways of migraine visual aura

As mentioned before, aura seems to reflect the process of CSD, despite the fact that subcortical structures

such as the thalamus seem to be involved. The visual cortex is known to be the starting zone of most of the migraine auras. Aura-related CSD is known to involve not only the primary visual cortex (V1), at the peristriated areas, but also their closely associated visual unimodal association areas (V2, V3, V4) and other extrastriated areas (V3/VP, V3A, V4v).^{1,2}

The anatomic pathways of visual dreams.

The anatomic pathways of dreams are not well understood, but there is an agreement that dreams originate in the memory banks at the hippocampal and parahippocampal areas. Some studies using functional neuroimaging showed that during rapid-eye movement sleep, significant activations were found in the pontine tegmentum, thalamic nuclei, limbic areas (amygdaloid complexes, hippocampal formation, anterior cingulate cortex) and in the posterior cortices (temporo-occipital areas in extrastriate areas).⁸ In 1980, Meyer and colleagues, by using Xenon 133 inhalation, have shown an increase in gray matter blood flow in the parieto-occipital zones during dreaming and during hipnagogic allucinations.⁹

The cases described above illustrate puzzling situations involving the processing of stored visual imagery and visual input.

Hypothesis derived from the above mentioned cases

1) Visual aura projects over hippocampal and parahippocampal image templates where they may fuse with dreaming imagery in a unique image; 2) memory banks use the extrastriate occipital cortex to form the image templates and the fusion with visual aura imagery may occur during this process; c) both process may occur independently but fuse within visual association areas.

The phenomenological analysis of the cases above give us clues for understanding the migraine visual aura phenomenon and to reinforce the cortical role for this important manifestation in these patients.

ACKNOWLEDGEMENTS

The authors express their appreciation to Ms. Marisa Avelar de Moraes for the review of style.

REFERENCES

1. Dalkara T, Zervas NT, Moskowitz MA. From spreading depression to the trigeminovascular system. *Neurol Sci* 2006;27(suppl 2):S86-90.
2. Lauritzen M. Cortical spreading depression in migraine. *Cephalalgia* 2001;21:757-60.
3. Queiroz LP, Rapoport AM, Weeks RE, Sheftell FD, Siegel SE, Baskin SM. Characteristics of migraine visual aura. *Headache*. 1997; 37:137-41.
4. Kowacs PA, Piovesan EJ, Lange MC, Werneck LC, Tatsui CE, Ribas LC et al. Prevalence and clinical features of migraine in a population of visually impaired subjects in Curitiba, Brazil. *Cephalalgia*. 2001;21:900-905.
5. Podoll K, Topper R, Robinson D, Sass H. Recurrent dreams as migraine aura symptoms. *Fortschr Neurol Psychiatr*. 2000; 68:145-9.
6. Heather-Greener GQ, Comstock D, Joyce R. An investigation of the manifest dream content associated with migraine headaches: a study of the dreams that precede nocturnal migraines. *Psychother Psychosom*. 1996;65:216-221.
7. Levitan H. Dreams which culminate in migraine headaches. *Psychother Psychosom*. 1984;41:161-6.
8. Maquet P. Functional neuroimaging of normal human sleep by positron emission tomography. *J Sleep Res*. 2000;9:207-31.
9. Meyer JS, Sakai F, Karacan I, Derman S, Yamamoto M. Sleep apnea, narcolepsy and dreaming: regional cerebral hemodynamics. *Ann Neurol*. 1980;7:479-85.

Correspondence

Pedro André Kowacs, M.D.
Instituto de Neurologia de Curitiba
Rua Jeremias Maciel Perretto, 300
81210-310 – Curitiba, PR, Brasil
phone/fax: + 41 3285.6613
pkowacs@gmail.com