Comments, Observations and Rebuttals

Can We Speak of Lack of Habituation in Visual Snow?

We read with interest the article by Unal-Cevik et al[1] reporting a case of visual snow (VS) in a patient with a pre-existing migraine with aura (MWA). The authors recorded a subjective improvement of the patient's VS symptoms after treatment with lamotrigine (LTG) and the effect was objectively assessed by the evaluation of repetitive pattern reversal visual evoked potentials (rVEPs). At baseline, the patient showed a potentiation response, defined as an increase in amplitude of rVEPs between the first and the last block of 100 stimuli, which partially recovered after treatment with LTG. In our opinion, the authors proposed a valid and feasible approach to explore the pathophysiology and therapeutic responsiveness of VS, but we feel that there are some methodological concerns that need to be discussed.

First, as the authors correctly stated, "the consequences of cortical hyperexcitability due to comorbid migraine cannot be eliminated," and this is a crucial point. Indeed the lack of habituation, or even potentiation, is recognized as a characteristic feature of interictal migraine, especially with aura[2] and in VS a high prevalence migraine (30-60%) has already been reported.[3,4]

Therefore, we believe that the potentiation effect on rVEPs that the authors described[1] cannot be unequivocally attributed to VS but rather seems to be related to the underlying MWA. We suggest that this finding should be more prudently confirmed on a larger number of patients, possibly trying to make a distinction between the subgroups of VS with or without comorbid migraine. If we were able to unveil some differences between those two groups we could ascertain whether a state of cortical hyperexcitability is truly VS related or just migraine related.

Second, taking in to account the ongoing controversy about the validity of rVEPs habituation paradigms in migraine, we suggest that in a single subject study design the reduction of the potentiation effect after LTG treatment should be interpreted with caution. Changes of few millivolts (mV) between blocks could be explained, for example, by an intrinsic sampling variability, fluctuations in subject's attention, or concomitant treatments.[5] Perhaps if we were able to demonstrate the restoration of a physiologic habituation response – at a group level – we could have a more solid clue to affirm that a normalization of cortical excitability levels has occurred.

Third, LTG has been proven to be effective in the prophylaxis of MWA.[6] Its mechanism of action is still only partially understood and presumably involves the modulation of the glutamatergic transmission, which may be altered in VS as well as in MWA.[7] Some patients with VS reported some improvement of VS after receiving LTG[3,8] but it is still unclear whether LTG ameliorates VS acting on both VS and migraine pathophysiology or if it has a specific effect on VS.

In this specific case, a concomitant effect on MWA should be hypothesized and this observation is supported by the patient's objective reduction of headache attacks and by the evidence of an increased likelihood of having additional visual symptoms and tinnitus in VS with comorbid migraine.[8]

We reaffirm that VS should be considered as a distinct clinical entity although the overlaps with migraine pathophysiology are relevant. Neurophysiological investigations are safe, non-invasive,

Abbreviations: LTG, lamotrigine; mV, millivolts; MWA, migraine with aura; rVEPs, repetitive visual evoked potentials; VS, visual snow.

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and cost-effective tools that may help unravel the inner mechanisms of VS. The adoption of different strategies (eg, different modalities of repetitive evoked potentials and TMS protocols) should be considered.

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