pISSN 1738-6586 / eISSN 2005-5013 / J Clin Neurol 2017;13(2):212-213 / https://doi.org/10.3988/jcn.2017.13.2.212

Comments on "Neuromuscular Ultrasonography of Cranial Nerves"

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Dear Editor,

We read with great interest the review article by Tawfik et al.[1] on the clinical applications of neuromuscular ultrasonography of cranial nerves. We would like to congratulate the authors for their interesting review, but we would also like to make some comments on the section concerning optic nerve (ON) evaluations, because in our opinion there are some points that need to be clarified.

The authors state that "the eye is vulnerable to the heat generated by the sound waves, and ultrasound can injure the retina and cause cataract formation in the lens." To the best of our knowledge this statement is not supported by the international literature, and a publication of the Food and Drug Administration issued on September 9, 2008 (information for manufacturers seeking marketing clearance of diagnostic ultrasound systems and transducers) includes warnings only for color Doppler scans, not for B-mode or A-mode scans.

The authors recommend performing the examination with the probe placed on the temporal and superior portion of the closed eye, while asking the subject to maintain his/her gaze at the midline in order to align the ON along the probe. If there is a risk of damaging the lens, such a position should be discouraged. When the patient has the eye closed, the Bell phenomenon will tend to result in the gaze moving upward, and so placing the probe over the eyelid will result in the ultrasound beam passing through the visual axis, involving the lens. To ask the patient to look forward does not help, because with the closed eyes it is not possible to control their position. A preferable protocol is to perform the examination with the eye open and, after administering anesthetic drops, placing the probe at the temporal side of the eye in order to avoid the lens.

The authors suggest that each laboratory needs to establish its own normative ranges, because different mean ON sheath diameters have been reported. The real problem in the variability of the cutoff is due to the use of a B-mode scan, which can be influenced by the so-called blooming effect. This effect that can be less important when dealing large lesions, can be misleading when we expect that a difference of less than 0.5 mm can make a difference, as in the case of ON lesions. In such cases performing the measurements with the so-called standardized A-mode scan–which is free of the blooming effect–can be much more precise even if it is a slightly more difficult to perform.[2,3]

The authors further state that the "determined cut-off value is proposed mainly for detection of increased intra cranial pressure and doesn't necessarily apply for diagnosis of other conditions, such as optic neuritis." We agree that the increase is not typical of an intracranial hypertension, but it can be found in optic neuritis, ON glioma, meningioma, or leukemic infiltration. The best way to differentiate these lesions is to perform the so-called 30° test.[4,5] This test, introduced in the late 1970s by Ossoinig,[2] consists of measuring the arachnoidal diameter during straight gaze and again during maximal abduction of the eye (30° gaze). A decrease in the diameter of greater than 5% during this maneuver proves the existence of sub-

Received December 14, 2016
Revised December 23, 2016
Accepted December 29, 2016

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arachnoidal fluid and allows this distension to be differentiated from either 1) solid thickening of the sheaths (e.g., in Graves' orbitopathy, ON sheath leukemic infiltration, or meningiomas)[6] or 2) swelling of the pial and arachnoidal sheaths in cases of arteriovenous fistulas or acute orbital inflammation.

Conflicts of Interest

The authors have no financial conflicts of interest.

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