improvement of feeling of dyspnea, which was assessed by a 5-point Likert scale. This scale is simple, easily reproducible, and describes the evolution of dyspnea and not the level of dyspnea as assessed with a Borg scale. This 5-point Likert scale has been used in previous studies assessing non-invasive oxygen support, including high-flow nasal cannula oxygen therapy, in similar settings of intensive care unit patients [3,8].

We also observed a trend toward lower ED length of stay in patients receiving high-flow oxygen as compared to standard oxygen. This finding suggests that ED organization and staff workload are not impacted by this new procedure. However, our study did not aim to assess the medico-economic impact of high-flow oxygen in the ED, but rather its potential clinical benefits in management of patients with acute hypoxemic respiratory failure.

Conflicts of interest

NM, JM and A-W T: none declared.

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The changing paradigm from subjectivity to objectivity in pupillary assessment during neurological examination

Pupillary assessment beside Glasgow coma scale (GCS) is an important part of neurological assessment because changes in the size, equality and reactivity of the pupils can provide vital diagnostic information in the critically ill and injured patient [1]. Pupil index (NPi) is being used as a sensitive measure of pupil reactivity and an early indicator of increasing intracranial pressure (ICP). Raised ICP may occur in patients with severe traumatic brain injury (TBI), aneurysmal subarachnoid hemorrhage, or intracerebral hemorrhage (ICH) and other acute neurological emergencies [2].

However assessment of pupillary size and reflex is subjective with high rate of inter-observer variability limiting the clinicians in taking critical treatment decision in time [3]. Moreover, ambient light conditions may affect the validity of visual assessment of pupil and increase the inter-observer disagreement. Clinical assessment of pupillary size & reflex is not possible in patients where eyelids cannot be retracted in raccoon eyes or where pupils cannot be visible like corneal opacity and hyphaema [3,4]. This is similar to subjective body temperature assessment before the revolution of objective assessment by thermometer.

The use of ocular ultrasonography for the evaluation of emergency patients has recently been described in the emergency medicine (EM) literature. Point of care ultrasound (POCUS) has been used to assess common acute ocular pathologies such as retinal detachment, lens dislocation, globe rupture and vascular lesion [5]. POCUS is simple, quick imaging tool to assess not only ocular pathology, but also act as window for intracranial pathology which provides bedside real time information [4].

Severe soft tissue damage or hyphaema may obstruct the visual access to the pupil, which makes direct papillary light reflex (PLR) observation difficult or impossible. Due to the importance of PLR evaluation, it seems prudent to consider other potential means of PLR assessment.

Point of care ultrasound assessed pupil in previous studies [3,4,6]. Limited literature suggest B-mode ultrasound is simple, rapid & objective method for quantitative assessment of pupillary function including PLR which may prove useful in where eyelid retraction is not possible or infrared pupillometry device is unavailable [1,5].

However literature regarding its use as an objective assessment tool during neurological examination has not been studied. POCUS guided objective assessment pupillary size and reflex may be used as an adjunct to neurological assessment and monitoring in critically ill or injured patients. Future studies are required validate this concept from subjectivity to objectivity.

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Ultrasound optic nerve sheath diameter measurement in optic neuritis

Dear Editor,

We read with great interest the case report written by Yee et al. regarding four cases in which they demonstrated the usefulness of transbulbar ultrasonography in evaluating the optic nerve to identify the presence of optic neuritis [1].

We congratulate the authors for their significant article because it really emphasizes the effectiveness of this technique in diagnosing orbital pathologies, but we would like to comment several aspects concerning the measurement of the optic nerve sheath diameter (ONSD).

In their case series, Yee et al. measured ONSD with B scan ultrasound technique, that is generally used to diagnose ocular diseases [2,3] but unluckily is less sensitive in measuring the orbital structures, because it is affected by the blooming effect [4-9]. This is related to the absence of a standard sensitivity setting in performing B scan and it means that, in case of this ultrasound method, if we measure ONSD with a lower sensitivity setting, this will give bigger dimensions compared to the ones obtained with an increased sensitivity setting. This effect could be less significant when we deal with large lesions, but it could be misleading if we suppose a difference inferior to 0.5 mm, as in case of ONSD appraisal.

For this reason, in case of future studies, we would like to suggest utilizing the Standardized A Scan technique: this examination makes these measurements objective and exacter, because it shows easily discernible high reflective spikes from the interface between arachnoid and subarachnoidal fluid, and it is blooming effect free too. In addition, it also permits more accurate reference range values, that can be used worldwide [10,11].

Furthermore, we would like to highlight that it is possible to distinguish between an increase in ONSD related to the presence of an optic neuritis or an optic nerve meningioma and that one caused by intracranial hypertension, thanks to "30 degree test" performed with a scan ultrasound examination [12-15].

Lastly, we would like to put attention on the relevance of learning satisfactorily how performing ultrasonography, avoiding errors and obtaining more trustworthy data. In fact, in literature, there are some papers where the measurements were performed in a wrong way [16], due to the blooming effect and to the difficulties in the exact placement of the probe and markers; moreover, skill to get reproducible measurements and a very good knowledge of orbital and ocular anatomy are necessarily required [17].

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