

ORIGINAL ARTICLE

Diagnostic performance of ocular ultrasonography compared to fundoscopy to predict papilledema

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ABSTRACT

BACKGROUND: The aim of this study was to determine the association between the diameters of optic nerve sheath assessed by ultrasonography, grading of papilledema in fundoscopy among patients suspected to raising intracranial pressure and determining the sensitivity and specificity of ultrasonography to detect optic nerve sheath dilatation.

METHODS: This prospective blinded cohort study was performed on 223 consecutive patients with clinical suspicion to optic papilledema. The patients were assessed using direct fundoscopy. The diameter of the optic nerve sheath was determined by ocular ultrasonography.

RESULTS: In fundoscopy, 46 patients were revealed to have papilledema in at least one of the two eyes. A significant correlation was found between diameter of optic nerve sheath and age in total population as well as in those without papilledema, but not in the group with papilledema. The mean diameter of optic nerve sheath in bilateral assessment was significantly higher in the group with papilledema. The association between the mean diameter of optic nerve sheath and grade of papilledema was strongly significant. The assessment of the area under ROC analysis showed that measuring diameter of optic nerve sheath could effectively discriminate papilledema from normal condition.

CONCLUSIONS: Ultrasonography can effectively discriminate papilledema from normal condition by measuring diameter of optic nerve sheath.

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Papilledema is mainly characterized by optic disc swelling secondary to elevated intracranial pressure due to a wide spectrum of cerebral pathological conditions such as intracranial tumor lesions, venous sinus thrombosis, inflammation, and ventricular obstruction or encephalitis.¹ The pathophysiological basis of this phenomenon is based on axoplasmic flow stasis accompanied with intra-axonal edema.² Following an increase in intracranial

pressure, this pressure may transfer to the optic nerve sheath leading to swelling of the nerve head and thus active nerve inactivation. Despite its rare occurrence, it may appear at any age with no sex and racial predilection.³ Clinically, manifestations of papilledema are mostly secondary to increased intracranial pressure including headache, nausea and vomiting, pulsatile tinnitus, impaired vision, diplopia, and visual acuity impairment in very advanced