SONOGRAPHIC OPTIC NERVE SHEATH DIAMETER IN PEDIATRIC RAISED INTRACRANIAL PRESSURE -CLINICAL COMPARARTIVE STUDY

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INTRODUCTION :

Raised intracranial pressure (ICP) is a neurological emergency in children, from etiologies such as febrile encephalopathy, tumors, hydrocephalus, trauma, and infections.

ONSD ultrasound offers a rapid, non-invasive bedside method for ICP detection, critical for management in resource-limited and acute settings.

OBJECTIVES :

1 Correlate optic nerve sheath diameter with intracranial pressure status in pediatric patients

2 Set practical USG ONSD cut-off values for screening in clinical practice.

STUDY METHODS

Design: Prospective, hospital-based comparative study Population: 100 children (50 with raised ICP, 50 controls), ages 3–16 Years Ultrasound: Sonosite LOGIQ e machine, 8–13 MHz probe, bilateral ONSD measured 3 mm behind globe Reference: CT/MRI confirmation, single radiologist for standardization

CLINICAL OUTCOME & UTILITY

94% of cases improved with management; 96% of controls improved.

• ONSD ultrasound is highly sensitive and practical for repeated bedside monitoring in pediatric critical care.

The cut-off value of 3.2 mm is recommended for high-specificity diagnosis of raised ICP in children.

RESULTS

GROUP	MEAN ONSD (mm)	CT/MRI ONSD	AGE/MEAN	M:F	MAIN ETIOLOGY
CASE	4.40+0.97	4.68+1.08	8.82	35:15	FEBRILE ENCEPHALOAPATHY (52%)
CONTROL	2.35+/- 0.275	-	33:17	-	-

CONCLUSION :

USG ONSD >3.2 mm reliably indicates raised ICP, recommended as a noninvasive triage and monitoring tool.

• This technique supplements but does not replace clinical assessment or goldstandard ICP monitoring

Further blinded, prospective studies needed for validation especially in infants

KEY DIAGNOSTIC CUT OFF

USG ONSD (mm)	sensitivity	specificity	optimal use
3.025	98%	96%	screening
3.2	94%	100%	Confirmatory

ROC AUC : 0.998 (STATISTICALLY SIGNIFICANT)

REFERENCE

Malayeri AA et al., J Ultrasound Med. 2005;24(2):143-7