

## **Effect of Cervical Collar on the Optic Nerve Sheath Diameter in Minor Head Trauma**

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### **Study Protocol**

Patients appealed to emergency department with blunt head trauma patients, aged >18, Glasgow Coma Score >13 and who signed written informed consent to participate in this study were included. Subjects with known eye or intracranial disease were excluded. All the patients trauma etiology were recorded and were assessed for NEXUS Head Computerized Tomography (CT) Rules for CT scan and the sonographers were blinded for CT examination decision and results.

Patients were lied on a stretcher in a supine position and were told to close their eyes. Sterile ultrasound gel applied to each eyelid of the patients. After gel appliance, 7.5 MHz linear probe with the ophthalmic setting (Mindray M5, Mindray, P.R.C.) was performed to measure the ONSD. The two experienced sonographers each performed at least 350 US per annum. They were certified for basic and advanced emergency sonography by the national emergency medicine society. The intraclass correlation coefficient of the two sonographers for sonographic measurement of ONSD was >0.9 according to local annual quality checks. Both sonographers measured 25 sonographic ONSD each, before this study. Both physicians were blinded to each other measurements. Ultrasound was performed individually in both sagittal and transverse planes. ONSD measurements were taken from the acknowledged standard location 3 mm posterior of the retina. Each eyes measurements were recorded for two times and then a mean binocular ONSD was calculated. In this way, baseline measurements were recorded.

After this baseline measurement, a rigid c-collar (ENPLUS, EN2050, Turkey) was placed for individual patient according to the appropriate size.

The same technique used to measure the ONSD after c-collar placement and the mean ONSD was again calculated. This process was done at time points after placement of c-collar; 5 minutes and 20 minutes. There was only one patient in the ultrasonography room and one researcher in the room at the same time. In this way, both researchers were blinded to each other's measurements.

We reported continuous variables as means and standard deviations (SD) with 95% confidence intervals (CI) since normality in distribution was observed by The Kolmogorov-Smirnov test. The significance of the difference between groups was assessed by ANOVA test. Categorical variables were reported as proportions and counts, and chi-squared test was used to compare proportions among groups. Student's t-test was used as the post-hoc test for ANOVA test, and significance threshold was accepted as  $p < 0.0016$  after Bonferroni correction. The inter-rater reliability of the sonographers for all time points were reported as interclass correlation values and 95% CI.