

COMPARISON OF OPTIC NERVE SHEATH DIAMETERS MEASURED BY OPTIC ULTRASONOGRAPHY BEFORE AND AFTER LUMBAR PUNCTURE IN IDIOPATHIC INTRACRANIAL HYPERTENSION PATIENTS

01 April 2014

Patient Selection Criteria

Patients who apply to the neurology outpatient clinic of Ankara Numune Training and Research Hospital between May 2014 and December 2015 with the pre-diagnosis of IIH will be included in the study. In order to determine normal ONSD measurement, who apply to the neurosonology unit for other complaints (dizziness, cerebrovascular accident, transient ischemic stroke, patent foramen ovale examination etc.) than headaches will be included as the control group after they signing the consent form and their ONSD will be measured. All the patients participating in the study will be informed about the method and the aim of the study. All cases will sign the informed consent form. For the patient group, individuals who will be diagnosed with IIH according to Modified Dandy criteria aged 17-65 having no contraindications for lumbar puncture, who accept the intervention and had no additional neurological or ocular disease; and for the control group, individuals who aged 17-65 and apply with other complaints than headaches, visual impairment or tinnitus will be included in the present study.

Cranial MRI will be obtained from patients in order to eliminate other factors that can cause ICP and to avoid intracranial LP contraindications. Evaluations will be made in terms of conditions that can create contraindications for the administration of lumbar puncture (intracranial mass, general condition disorder, thrombocytopenia or other haemorrhage problems, infection in the LP area, severe skeletal dysplasia). The patients' medical history including age, height, weight and body mass indices will be recorded. The study was approved by the Ethical Committee of our hospital.

Body Mass Index Evaluation

Body mass indices will be calculated using the formula "Body Weight (kg)/ Height in meters squared (m^2)". According to this formula, individuals with a BMI of <20 are categorized as underweight, 20-25 as normal weight, 25-30 as overweight and >30 as obese. However, while comparing the data in our study, we will evaluate the patients in two groups as BMI <30 non-

obese and BMI >30 obese. In our study, CSF opening pressure limit value will be accepted as 200 mm H₂O (CSF) in patients with BMI <30 and as 250 mm H₂O (CSF) in those with BMI >30, that is, in obese patients.

Optic Nerve Ultrasonography

Measurements will be taken from all the patients before and 10-15 minutes after the LP by a neurosonologist experienced in ONSD measurement, have no prior information about the patients' clinical characteristics and who will not participate in the LP administration or treatment decision of the patients. A high resolution (Toshiba Xario Model SSA-660A, Japan) ultrasonography device and a 7.5 MHz linear probe will be used for the measurements. After making depth and gain adjustments, carotid-vertebral artery ultrasonography will be adjusted, and MI (mechanical index) will be reduced in accordance with the international rules. The patients will be told to look forward with their eyes closed in supine position and gel will be applied to both eyes. As described in the literature, ONSD measurements will be taken twice from the border surrounded by the hyperechogenic intraorbital fat tissue of the hypoechogenic nerve sheath surrounding the hyperechogenic area around the optic nerve (overall sheath diameter) of both eyes at 3 mm under the bulb from the sections that give the best images of the area where optic nerve enters into the globe by rotating clockwise and the measurements will be recorded on the axial and sagittal planes.

Lumbar Puncture Procedure

After measurements will be obtained before LP, the patient will be placed in the lateral decubitus position. All the patients will be given 20 mg of subcutaneous prolicaine for local anaesthesia. Over the line drawn from the superior iliac spina border, spinous processes will be examined and following the sterilization with povidone-iodine, subarachnoid space will be entered using an 18Gx90 mm LP needle from the appropriate distance. Once the CSF will be seen to be coming out, CSF opening pressure measurement will be taken with an LP manometer. After measuring the opening pressure, approximately 15-20 ml of CSF will be taken as sample for the laboratory examinations; later the CSF closing pressure will be measured, and the administration will be finalized by taking the needle out. The patient will be rolled back to the supine position. Ultrasonographic measurements will be taken again 10-15 minutes after the LP administration. Similarly, USG and ONSD measurements will be obtained from the control group in supine position without LP.

Statistical Analyses

The data will be given as mean \pm SD and put into analysis on SPSS (23.0) package program. For all the tests, values under the p value of 0.05 will be accepted as statistically significant. Chi square test, independent sample test, paired sample test and Pearson correlation analyses will be carried out for the evaluation of the data. Statistical numeric data will be rounded off to have a single digit after the decimal point.