

## **MRI derived Intracranial Compliance in patients with Idiopathic Intracranial Hypertension**

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### **Object**

Idiopathic intracranial hypertension (IIH) is a neurological disorder that is characterized by increased intracranial pressure (ICP) in the absence of a tumor or other diseases. Intracranial compliance (ICC), the variation of the Intracranial Volume (ICVC) and local craniocervical hydrodynamic parameters derived using magnetic resonance (MR) imaging flow measurements were assessed in patients and control volunteers to evaluate the role of these factors in the associated pathophysiology.

### **Methods**

Seventeen patients with IIH diagnosis and a mean age  $39 \pm 10$  years and fourteen healthy volunteers that report no history of neurological disorders and a mean age  $27 \pm 3$  years were studied using a 3-tesla MR imager; both patients and volunteers were all females. Cine phase-contrast images of blood and cerebrospinal fluid (CSF) flow to and from the cranium were used to quantify local hydrodynamic parameters, ICVC and ICC. The cervical level at which were performed the measures were C2 and C3.

### **Results**

Differences in the systolic cervical CSF velocity and flow and the mean volume between the systolic and the diastolic phase, comparing healthy volunteers and patients with IIH, were not statistically significant. Were instead observed in patients compared with controls a statistically significant lower ICVC ( $p < 0.039$ ) and ICC ( $p < 0.015$ ) (table 1).

### **Conclusions**

Analysis of results have indicated that ICC and ICVC are more sensitive than local hydrodynamic parameters to changes in the craniospinal biomechanical properties in IIH patients. The authors concluded that decreased ICC and ICVC better explain IIH pathophysiology than local hydrodynamic parameters such as cervical CSF velocities.

Region	Parameter	Patient	Controls	P-Value
C2	Max mean CSF velocity (cm/s)	1.9±0.7	2.1±0.8	0.548
	Max mean CSF flow (mL/min)	220±60	200±70	0.487
	Mean CSF Volume (mL)	0.69±0.20	0.76±0.20	0.348
C3	Max mean CSF velocity (cm/s)	3.1±1.1	3.2±1.0	0.638
	Max mean CSF flow (mL/min)	230±70	200±60	0.304
	Mean CSF Volume (mL)	0.70±0.23	0.76±0.22	1.348
---	ICVC(mL)	<b>0.42±0.16</b>	<b>0.61±0.08</b>	<b>0.039</b>
---	ICC (cm <sup>2</sup> /mmHg)	<b>4.9±2.8</b>	<b>9.4±5.3</b>	<b>0.015</b>