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AUDITORY OBJECTIVE MEASURES

Auditory P300 monitoring on the cerebrospinal fluid Tap-test: preliminary results

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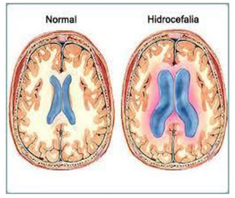
Abstract

Idiopathic Normal Pressure Hydrocephalus (iNPH) is characterized by an abnormal enlargement of the cerebral ventricles with increased cerebrospinal fluid (CSF) in the elderly population (Figure 1). For the diagnosis, the CSF Tap-test (TT) is indicated, in which a neuropsychological and gait assessment is carried out before and after a CSF lumbar puncture, and the clinical improvement, whether in gait or cognitive performance, indicates a positive predictive result for iNPH. Despite this, CSF TT remains with low clinical sensibility, requiring complementary evaluation methods to improve the diagnosis accuracy. The P300 is a cognitive potential that has emerged as a neurophysiological biomarker in several other pathologies. Thus, it is of scientific and clinical interest to evaluate its applicability as an additional method during CSF TT, minimizing risks to the individual and complementing the diagnosis of iNPH.



Fonte: https://fisioteraloucos.com.br/hidrocefalia-de-pressao-normal/

Objective

This study investigates whether patients with a positive predictive value of the CSF TT for iNPH exhibit improved auditory P300 responses after lumbar puncture.

Materials and Methods

Population:

- **40 people suspected of iNPH**, both sexes, aged between 62 and 86 years old:
  - **20 negative** predictive value of the CSF TT
  - **20 positive** predictive value of the CSF TT
- All participants exhibited neurologic signs and **symptoms consistent with iNPH**, such as gait disturbance, urinary incontinence, and/or cognitive impairment; ventricular enlargement (Evans' index ≥0.3), and CSF opening pressures between 70 and 245 mm H2O for all participants.

Procedures:

- During the TT, besides gait and neuropsychological assessment, the **auditory P300 responses** were recorded before and after lumbar puncture with the removal of 30 to 40 ml of CSF.
- The changes in auditory P300 responses were compared between the groups and evaluation's moment by ANOVA test.

Results

Subjects with a positive predictive value of the CSF TT had a significant decrease in the P300 latency in the right ear, around 27.65 ms, after lumbar puncture compared to subjects with a negative predictive value of the CSF TT (Figure 1; Figure 2).

The auditory P300 response is considered a cognitive component and reflects the attentional response to the stimulus, related to the integrity of cognitive functions, providing information on auditory abilities, such as attention and auditory discrimination, and temporal processing

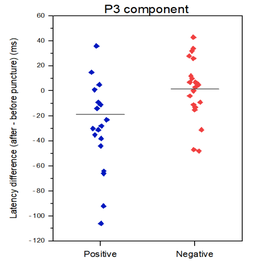


Figure 1- The latency difference of P3 in the right ear compared between the CSF TT results

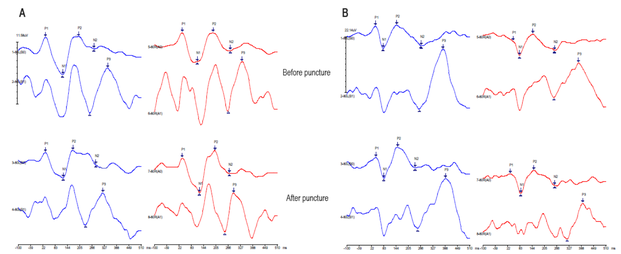


Figure 2- Waveforms examples from a subject with a positive predictive value of the CSF TT (A) and a subject with a negative predictive value of the CSF TT (B).

No increase in amplitude was observed in subjects with a positive CSF TT predictive result.

Conclusion

The decrease in latency of the P300 auditory response after lumbar puncture was associated with the positive predictive value of CSF. Thus, the latency analysis of this component has shown promising for supporting the CSF TT outcome of subjects with suspected iNPH.

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