

Featured Article

Performance and complications of lumbar puncture in memory clinics: Results of the multicenter lumbar puncture feasibility study

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Abstract

Introduction: Lumbar puncture (LP) is increasingly performed in memory clinics. We investigated patient-acceptance of LP, incidence of and risk factors for post-LP complications in memory clinic populations.

Methods: We prospectively enrolled 3868 patients (50% women, age 66 ± 11 years, mini mental state examination 25 ± 5) at 23 memory clinics. We used logistic regression analysis using generalized estimated equations to investigate risk factors for post-LP complications, such as typical post-lumbar puncture headache (PLPH) and back pain.

Results: A total of 1065 patients (31%) reported post-LP complaints; 589 patients (17%) reported back pain, 649 (19%) headache, of which 296 (9%) reported typical PLPH. Only few patients needed medical intervention: 11 (0.3%) received a blood patch, 23 (0.7%) were hospitalized. The most important risk factor for PLPH was medical history of headache. An atraumatic needle and age >65 years were preventive. Gender, rest after LP, or volume of cerebrospinal fluid had no effect.

Discussions: The overall risk of complications is relatively low. If risk factors shown in this study are taken into account, LPs can be safely performed in memory clinics.

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Keywords:

Lumbar puncture; Cognitive disorders; Alzheimer's disease; Memory clinic; Post-LP complications; Post-LP headache; Multicenter study on LP feasibility

1. Introduction

Numerous studies have shown high diagnostic accuracy of cerebrospinal fluid (CSF) biomarkers for diagnosing Alzheimer's disease (AD) [1–3]. This has resulted in inclusion of CSF biomarkers as evidence for AD pathology in the research diagnostic guidelines for AD and mild cognitive impairment (MCI) [4–6]. As a result, CSF collection by means of lumbar puncture (LP) is being performed in a growing number of memory clinics [7–9]. Factors that may hamper widespread implementation of CSF biomarkers in diagnostic routine are, however, the attitude toward LP among clinicians (need of training and time constraints) and patient expectations (fear of pain and complications) [10]. In addition, the procedure itself is debated because of its invasive nature, which entails complaints following LP in a proportion of patients.

The most frequent post-LP complication is postlumbar puncture headache (PLPH) [11]. The reported incidence varies widely however, even when performed in comparable memory clinic populations, the proportion ranged from $<1\%$ to as high as 25% [12–15]. Lower incidence of PLPH has been reported when using a needle with a

smaller diameter, or an atraumatic (pen-point) instead of a cutting-edge needle tip [16–19]. In addition, younger age and female gender are regarded risk factors for PLPH [20–22]. Most of these risk factors have been studied in a much younger population than that of a memory clinic. Consequently, they may be less relevant in mostly elderly memory clinic populations. Moreover, many studies had relatively small sample sizes ($n < 500$), with insufficient power to simultaneously evaluate several risk factors.

In this largest to date, prospective multicenter study, including data from 22 memory clinics across Europe and one in Brazil, we aimed to evaluate acceptance rate of LP, incidence of post-LP complications, and patient- and LP-related risk factors for post-LP complications in the memory clinic population.

2. Methods

2.1. Patients

Patients were consecutively enrolled from November 2010 until March 2014 in 23 centers participating in the JPND project BIOMARKAPD, resulting in 3868 patients.

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