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SHORT COMMUNICATION

Cerebrospinal fluid diagnostics in first-episode schizophrenia

Laura Kranaster · Dagmar Koethe · Carolin Hoyer · Andreas Meyer-Lindenberg · F. Markus Leweke

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Abstract We evaluated the clinical use and the safety of cerebrospinal fluid diagnostics in 155 patients with the suspected diagnosis of first-episode schizophrenia. Five patients (3.2%) revealed pathological findings that lead to diagnostic re-evaluation and changes in clinical management. No serious adverse events occurred, but we documented 16 (10.3%) cases of mild to moderate headache or local pain at the puncture site. Our results underline the value of lumbar puncture in the clinical workup of first-episode patients with suspected schizophrenia.

Keywords Schizophrenia · CSF · Diagnostics

Introduction

The routine use of lumbar puncture (LP) in patients with suspected schizophrenia is controversial. While German practice guidelines recommend it in cases of suspected organic etiology, those of the United States, Canada, or the United Kingdom do not even mention cerebrospinal fluid (CSF) diagnostics. Although it is generally accepted that most symptoms of schizophrenia can be mimicked by other brain disorders, many psychiatrists hesitate to perform LP in patients presenting with schizophrenia-like symptoms (e.g., acoustic hallucinations such as voices or typical thought disorder), blank medical history, and normal physical and neurological examination. The consequences of this strategy can be severe if a causally treatable condition is missed; however, limited data are available to guide clinical decision-making. Here, we present results from a large prospective examination that provides an estimate of risks and benefits associated with LP in first-episode schizophrenia.

Methods

The study was reviewed by the ethics committee of the University of Cologne and performed in accordance with the Declaration of Helsinki. All participants gave written informed consent prior to inclusion. Of 166 consecutive admissions of antipsychotic-naïve (i.e., no known previous or current treatment with antipsychotic medication; benzodiazepines were tolerated) patients with the suspected diagnosis of first-episode of schizophrenic or schizophreniform psychosis according to the diagnostic criteria of the DSM-IV (295.10; 295.30; 295.40), 155 patients (93% of total, 61.3% man; age 29.8 ± 9.6; PANSS-P: 22.5, PANSS-N: 22.4; PANSS-G: 47.1; PANSS-T: 92.0) agreed to participate. Routine CSF analyses included total cell count, total protein, ratios of albumin, IgG, IgM, IgA, and glucose, oligoclonal bands, lactate, and antibody indices of neurotrophic viruses as well as Toxoplasma gondii and Borrelia burgdorferi.

Results

Five patients (3.2%) revealed pathological findings that changed clinical management, subsequently leading to a

L. Kranaster, D. Koethe authors contributed equally to the study.

L. Kranaster · D. Koethe · C. Hoyer · A. Meyer-Lindenberg · F. M. Leweke (✉)
Department of Psychiatry and Psychotherapy,
Central Institute of Mental Health, Ruprecht-Karls-University Heidelberg, J5, 68159 Mannheim, Germany
e-mail: leweke@cimh.de

L. Kranaster · D. Koethe · C. Hoyer · F. M. Leweke
Department of Psychiatry and Psychotherapy,
University of Cologne, 50924 Cologne, Germany

diagnosis of organic psychotic disorder. Interestingly, these five cases did not differ in psychopathology, course of disease, or other clinical features from the other patients. In detail, one patient was diagnosed with herpes simplex encephalitis, another with neuroborreliosis, and two patients revealed a chronic inflammation in the central nervous system of uncertain origin, and thus, a diagnosis of schizophrenia was ruled out by definition. The fifth presumed first-episode patient was diagnosed with multiple sclerosis after results of the CSF analysis had been strongly suggestive thereof and further examinations had been performed. With LP, no serious adverse event occurred but we documented 16 (10.3%) cases of mild to moderate adverse events, mostly either headaches or local pain at the puncture site. There were two cases of full-blown post-LP-headache syndrome with nausea.

Discussion

Our results underline the value of LP in the clinical workup of first-episode patients presenting with a psychotic syndrome suggestive of schizophrenia. In our sample, LP performed according to evidence-based recommendations [10] was a safe procedure acceptable for the great majority of eligible subjects with first-episode psychosis, an observation similar to that made in other patient populations [9]. Beyond the etiologies of organic psychosis mentioned above, several other causes are possible and could be ruled out with CSF routine diagnostics, such as encephalitis through all kinds of pathogenic agents (e.g., neurosyphilis, HIV, or toxoplasmosis) or autoimmune disorders. Compared to routinely performed structural neuroimaging, where clinically relevant findings (changing diagnosis or management) are obtained in about 1% [1], our yield of 3.2% relevant abnormal findings is considerable. Our results are in concordance with the data from Bechter et al. who had to re-diagnose 6% of their patients suffering from schizophrenic or affective spectrum disorders after CSD diagnostics [2]. The benefits of minimizing the risk of a false diagnosis, inappropriate or ineffective clinical management and thus a less favorable prognosis for the patient outweigh the low to moderate risk for reversible and mostly mild side effects.

Ideally, CSF diagnostics should be performed before initiation of antipsychotic treatment since the latter has been shown to alter disease-specific patterns of proteins [4] or inhibit viral replication [5], leading to ambiguous results. Thus, we highly recommend implementing CSF screening as part of the diagnostic routine before the initiation of antipsychotic treatment. In addition to the clinical relevance of selecting the appropriate treatment for an organic psychotic disorder, preventing false diagnoses by improved diagnostics in schizophrenia might provide slightly better data on the effectiveness of antipsychotics and long-term treatment strategies that can be associated with severe side effects and economic burden. CSF diagnostics in schizophrenia probably will become even more important when powerful biomarker candidate [6] approaches based on proteomics [4, 7], metabolomics [3], or lipidomics [8] mature and become applicable as it is already the case in the diagnostics of Alzheimer's disease.

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