

Diagnostics in Liver Diseases

10 Neurological and psychological diagnostics

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10 Neurological and psychological diagnostics

There are **two basic dimensions** in the way the human brain copes with everyday routine; these are known as crystalline and fluid intelligence (R. B. CATELL, 1963).

1. **Crystalline intelligence** is acquired by education and experience; it proves susceptible to disturbance at a relatively late stage in life and to a relatively small extent. • Crystalline (cognitive and verbal) intelligence implements the contents of what has been learned or acquired at an earlier stage to perform tasks or to solve problems. This verbal (“cognitive”) intelligence is retained for a long time, so that any impairment of cerebral function is noticed at a relatively late stage in people who pursue mental occupations.

2. **Fluid intelligence** depends largely on the speed at which information is processed; it becomes impaired relatively early and to a greater extent. • Fluid (practical and nonverbal) intelligence is characterized by the capability for solving new problems without reference to experience or education in the course of processing information. This form of intelligence deteriorates at an early stage with any impairment of cerebral function, which is why the intelligence involved in performing practical tasks, so-called handling intelligence, is most susceptible to disturbance – it is for this reason that manual activities are primarily impaired.

Many different **brain functions** are available to enable routine everyday tasks to be mastered correctly. (s. tab. 10.1)

1. Attentiveness
2. Intellectual capacity
3. Logical thinking
4. Memory for design
5. Perceptive faculty
6. Power of concentration
7. Psychomotoricity
8. Reactive capacity
9. Short-term memory
10. Spatial perception and mental comprehension of numbers or letters, *etc.*

Tab. 10.1: Brain functions important for mastering routine everyday tasks

1 Brain disorders in liver diseases

In the case of cerebral dysfunction, it is possible for these disorders to be reflected individually in differing states of intensity and in a variety of combinations. This results in a very varied pathophysiological and clinical picture of **encephalopathy**. Such a collective term for restrictions in the function of the brain does not, however, yield any statement as to their origins or pathogenesis. Encephalopathy can be triggered by some 50–60 disorders and aetiological factors – including liver diseases. (see chapter 15)

Hepatic encephalopathy (HE) is defined as a functional, potentially reversible disorder of the brain in the wake of severe (either acute or chronic) liver disease. The term comprises all neurological and mental symptoms.

► Diagnosis of the 4 clinical stages of **manifest HE** (stages I–IV) is simple and reliable. However, it is important first of all to recognize **latent HE** (stages 0, 0–I), which is also called *subclinical hepatic encephalopathy (SHE)* or *minimal HE*. • At this stage, no clinically identifiable mental or neurological defects can be detected, nor do the laboratory parameters provide any particular clues. Yet, there are (still reversible) neurophysiological and neuropsychological deviations from the norm which can be quantified.

Early diagnosis of HE at the **latency stage** is of great significance in social terms, for industrial medicine and for prognostics; therefore it is of enormous economic importance as well. The development of latent (minimal and subclinical) or subsequent manifest HE (stages I–IV) depends on various factors. • *Latent HE is considered to be the “most frequent complication” in hepatology.*

2 Diagnosis of disorders in cerebral performance

It should be noted that the diagnosis of latent HE (stages 0, 0–I) can cause great **difficulties**.

► Despite the considerable medical and social implications of SHE, which in objective terms are undeniable, the patient subjectively feels unchanged and free from symptoms. There are no ailments or malaise felt by the patient which point to the development of SHE, and neither the conversation with the physician nor the anamnesis are suggestive of this condition. *Verbal intelligence is not affected!*

► Neither clinical findings nor laboratory parameters (including intensive and scientific tests) correlate with the stage of SHE. There are no neurological abnormalities (no hyperreflexia, tremor or asterixis, etc.). • *For the diagnosis of subclinical hepatic encephalopathy, only electroencephalographic and neuropsychological (psychometric) test procedures are available so far.*

2.1 EEG

Spontaneous EEG can occasionally show a minimal increase in slow waves and a deceleration of the basic activity below the normal