Mini Review

Minimal hepatic encephalopathy to drive or not to drive?

Abstract

Minimal hepatic encephalopathy (MHE) is a frequent complication of cirrhosis. It diagnosis requires specialized psychometric and neurophysiological tests making it hard to diagnose in common practice. MHE may cause impairment of driving ability, leading to an increased risk formot or vehicle accidents (MVA). The fitness to drive of MHE patients is one of the questions that hepatologists need to deal with on a daily basis. Assessment of driving ability of MHE patients requires expensive and time–consuming driving simulator or real–life driving tests and current work aims toward verification of pshychometric computerized tests for this purpose.

The aim of the current article is to review existing evidences of causative link between MHE and impaired driving ability and to summarize current ways of driving ability evaluation in cirrhotic patients.

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Abbreviations: MHE; Minimal hepatic encephalopathy, MVA; Motor Vehicle Accidents, HE; Hepatic Encephalopathy

Introduction

Hepatic encephalopathy (HE) is a well–recognized complication of cirrhosis that leads to significant neuro–cognitive dysfunction ranging from mild disorientation to profound coma. Minimal hepatic encephalopathy (MHE) is a preclinical form of HE that can be diagnosed only by psychometric and electrophysiological tests. In different series the frequency of MHE in asymptomatic cirrhotic patients varies between 30 to 60%.[1] Despite the absence of clinical manifestations, MHE has high impact on patient's quality of life, learning ability, work capability and driving skills. The presence of MHE predicts the development of overt hepatic encephalopathy (OHE) and of reduced survival.[2,3]

Defining MHE as a condition that causes an impairment in driving skills may have a huge impact on the cirrhotic patient's life. On the one hand, saving them from devastating consequences of motor vehicle accidents (MVA), while on the one hand, decreasing their quality of life by making them dependent and less mobile.

Discussion

Studies that have been performed in MHE patients during the last decade provide firm evidence of a significant impairment in their driving skills. These stem from impaired vigilance, reduced sustained attention, and decreased executive function.[4–8] The data are coming from driving simulators and road driving tests, but also from real–life reports of Departments of Transportation, that reveal higher frequency of driving violations and MVAs in this population.[9] Results of several recent studies are summarized in Table 1.

Table 1 Summary of recent studies assessing driving ability of MHE patients

Study	Number of MHE Patients	Assessment of Driving Ability	Results in MHE Patients
Wein C et al..[4]	14	Real life driving with an instructor	Significant reduction in the total driving score ($p<0.05$). Significantly more need for instructor intervention to avoid an accident (5 out of the 14 MHE patients).
J Bajaj J et al..[5]	42	Anonymous driving history Driving behavioral questionnaire	Significantly higher percentage of violations (36% in 5 years) and accidents (33% in 5 years) then non–MHE patients
Bajaj J.[6]	33	Driving simulator Navigation task	Significantly higher rate of accidents. Failure in navigation task in the majority of MHE patients
Kircheis G.[7]	27	Computerized driving ability tests (FEV5 and BGL) Real driving	16% of MHE patients unfit to drive according to the computerized tests 36% unfit to drive according to real driving test
Felipo V et al..[8]	15	Driving simulator Driving test	Impaired driving ability correlating with MHE grade. Impaired vehicle lateral control in spite of reduced driving speed.

Despite these convincing data suggesting that many patients with MHE are unfit to drive, counseling a specific patient about his driving ability remains challenging. Assessing driving ability cannot be performed during a routine visit and attempts to find the appropriate psychometric tests that will be a good predictor of driving skills are still ongoing. In the article by Kircheis et al..[7], driving fitness of 27

MHE patients was evaluated and high discrepancy between results of computerized driving assessment and real life driving was observed. According to the psychometric tests, 93% of controls and 84% of MHE patients were fit to drive, while driving instructor assessment approved driving ability significantly less: 87% and 48% respectively.

Bajaj J et al.[6], showed in 35 MHE patients that the Inhibitory Control Test (ICT)was a good tool to evaluate driving ability. This work demonstrated good correlation between number of ICT lures and number of accidents on the driving simulator.

Ina recent work by Felippo V et al.[8], a battery of four psychometric tests (The Basic Skills Assessment of the Driver Test Battery) was used, in addition to a driving simulator test, to assess driving ability of 15 MHE patients. Good correlation between the psychometric tests results and the speed and lateral control of the vehicle was shown. While the value of psychometric tests in defining driving ability remains to be proven, driving simulator tests show good correlation with real–life driving performance. In a recent study by Lauridsen M et al.[10], a large group of 95 MHE patients were repeatedly evaluated on a driving simulator and their real–life driving records were collected. Strong correlation between several parameters of driving simulator assessment and real–life driving performance was observed. In subjects who had a real–life crash within a year prior to study enrollment, there was a significantly higher number of simulator crashes (median 4 vs 2; P=0.03) and illegal turns (median 1.0 vs 0.5; P=0.05) compared to patients without a real–life crash.

Conclusion

Driving ability may be significantly impaired in MHE patients, causing an increased risk for traffic violations and MVAs in this population. Assessment of driving fitness by simulator or real–driving test should therefore be recommended, especially in the patients with significantly impaired psychometric tests.

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