Mild Hepatic Encephalopathy (HE) Assessed by the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) is Highly Prevalent in Ambulatory Patients with Cirrhosis

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1. BACKGROUND

- HE is a neuropsychiatric complication of cirrhosis thought to be caused primarily by increased ammonia levels
- Symptoms of HE range from mild impairment in attention to coma and are measured on a scale of 0-4, the West Haven Criteria (WHC)[1]
- A majority of patients with no overt evidence of HE (WHC Grade 0) have neuropsychometric impairment when tested, a condition termed minimal HE[2]
- The ISHEN recommends using the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) to diagnose minimal HE patients in the USA[3]
- Many clinicians have a difficult time distinguishing WHC Grade 0 from WHC Grade 1 HE[4,5]
- The RBANS is a 12 part test, that assesses patients on 5 domains of neuropsychometric function[6]
  - Immediate memory
  - Visuospatial/Constructional
  - Language
  - Attention
  - Delayed memory

2. METHODS

- We conducted a study evaluating the ability of AST-120 (spherical carbon adsorbent) to improve neurocognitive function in patients with Mild HE (MHE)
- We defined MHE as any cirrhotic patient with WHC Grade 0-1 HE and an RBANS score below the 10th percentile for society
- This is 1.67 standard deviations below the population mean
- For comparison, an RBANS score more than 1 standard deviation below the population mean is seen in mild Alzheimer's patients[6]
- Trained raters used the RBANS to determine eligibility for participation in the trial
- Subjects with cirrhosis between the ages of 18-70 were eligible for screening provided that:
  - MELD score was ≤ 25
  - No history of TIPS or surgical shunt
  - No episode of overt HE within the previous 3 months
  - No concomitant use of lactulose, rifaximin or neomycin

3. RESULTS

- 301 subjects were screened
- **54%** of all subjects screened for the study were found to have an RBANS score below the 10th percentile for their age and education matched cohort (i.e. MHE)

Table 1. A comparison of the MHE and non-MHE populations - Demographics

	MHE	No MHE
%of Overall Population	54	46
Age (years)	55 (25-69)	56 (40-70)
Gender (% Male)	59	64
Race (% Caucasian)	81	84
Education - % HS Grads	79	83
% College	53	50
Etiology of Liver Disease		
% HCV	50	68
% NASH	17	13
% EtOH	16	10
% Other	17	15

Table 2. Summary of RBANS Scores

	MHE	No MHE
RBANS		
Mean	74	94
Median	76	92
Range	49-88	76-119

Table 3. A Comparison of the MHE and Non-MHE Populations – Severity of Liver Disease

	MHE	No MHE
MELD Score	10 (6-23)	9 (6-20)
% with Esophageal Varices	44	38
% with Hyperbilirubinemia	37	26
Platelet Count	136 (28-341)	136 (40-359)
% with Low Platelets (<150)	68	64
% with Very Low Platelets (<75)	20	21
% with West Haven Grade 1 HE	36	24

Table 4. Were Any Factors Predictive of MHE?

	MHE	No MHE
MELD Score		
<10	52%	48%
10-15	65%	35%
>15	67%	33%
Platelets		
Normal	51%	49%
Low	56%	44%
Very Low	53%	47%
Varices		
Absent	47%	53%
Present	49%	51%
Education Level		
Did not Complete High School	60%	40%
High School Graduate	49%	51%
College	54%	46%

4. CONCLUSIONS

- This study screened relatively healthy cirrhotic patients
  - MELD Scores of ~9-10, no recent episodes of HE
  - More than half of the patients screened were found to be neurocognitively impaired, with evidence of MHE
- The prevalence of MHE in this population was independent of age, gender, education level or the severity of the underlying liver disease
- No factors were found that could easily predict which patients would have MHE
- The RBANS was easy to administer in this setting

5. REFERENCES

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