

## Mental Execution and Liver Capacity Among as of Late Abstinent Liquor Victimizers

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### ABSTRACT

It has frequently been suggested that some of the enduring subtle cognitive impairments seen in sober alcohol-dependent persons may be a result of subclinical liver dysfunction. Cognitive performance and liver function among 85 recently abstinent alcohol-dependent persons were assessed by means of a neuropsychological examination and the GGT test of liver function. Unlike some previous studies, no relationships were found between the two areas of functioning. It is argued that lack of statistical power did not account for the failure to find an association between the two domains. The proposition that residual cognitive impairment in abstinent alcoholic persons is (partly) mediated by earlier liver dysfunction rests on slight empirical foundations and remains speculative.

**Keywords:** Cognitive impairment; Liver function; Alcohol abuse

### INTRODUCTION

A number of studies have examined the relationship between subtle liver dysfunction, evidenced only by laboratory tests, and cognitive impairment. Expert said found that alcoholics without overt liver disease, but who showed abnormal liver functioning (by GGT>40 IU/l) performed less well on four neuropsychological tests than those with normal GGT readings. expert said found that alcoholics, without overt liver disease but with elevated (>80 IU/l) GGT tests on hospital admission scored more poorly on a neuropsychological tests administered 21 days after last drink. expert said, whose sample partially overlapped that of Irwin et al., also screened their alcoholic participants for overt liver disease and found that liver impairment (measured by bilirubin direct) on admission to an inpatient treatment program predicted poorer concurrent performance on two out of four neuropsychological tests, after controlling for age and vocabulary. Taken severally, these studies suggest an association between subclinical liver malfunction and neuropsychological performance when these are measured at about the same time and in the context of very recent alcohol consumption. However, the evidence is not quite consistent. examined 47 alcohol-dependent males who had been abstinent for an average of 3 weeks, and found no reliable or substantial association between a variety of measures of liver function, including serum albumin and GGT, and several cognitive tests.

Additionally, Schafer et al. failed to find a liver/neuropsychological-function association after 28 days of inpatient treatment, or at 3 months follow-up. These negative findings question the existence of a link between liver dysfunction (measured at any time) and residual cognitive impairment.

### METHODS

#### Participants

The sample consisted of 85 outpatients of an Irish private psychiatric hospital selected from a total of 136 referrals for examination of suspected cognitive impairment secondary to alcohol abuse. All had a firm diagnosis of the Alcohol Dependence Syndrome (ADS) according to ICD-9 criteria. Exclusion criteria for the study were as follows: (i) a primary diagnosis other than that of ADS; (ii) history of head injury, cerebrovascular accident, or illness (including frank liver disease), which could potentially affect neuropsychological functioning; (iii) history of psychotropic drug abuse, apart from alcohol; and (iv) less than 3 weeks abstinence from alcohol prior to neuropsychological examination. Of the sample, 74% were male; the mean age was 54 years (S.D=13).

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## Measures

The examination schedule consisted of subtests from the WAIS and the WAIS-R: digit symbol, block design, and digit span, selected for their established sensitivity as measures of alcoholic cognitive impairment; and vocabulary and picture completion as indicators of premorbid intellectual functioning. The WAIS was used with 49 participants; the WAIS-R, over a somewhat later period, had 36 participants. Memory was measured by expert said adaptation of the logical memory and visual reproduction subtests of the Wechsler Memory Scale.

The mean number of definite alcohol-free days prior to neuropsychological examination was 49 (S.D.=39) and 90% of participants were examined within 83 days of abstinence. The measure of liver function on admission to the program in the standard hospital package of laboratory tests was GGT. The examiner was blind to the results of the GGT test.

## Data treatment

Using manual and other appropriate norms, all cognitive test scores were age adjusted and expressed as scores from distributions with means of 10 and standard deviations of 3. Abnormal GGT was defined by hospital policy as >56 IU/l.

## DISCUSSION

Overall participants' scores on alcohol-vulnerable cognitive measures were substantially below normative values for the general population. However, there was no association between this residual impairment and GGT status on admission to the treatment program. This study fails to replicate that of expert said, although the two are procedurally similar in many respects.

Of relevance here also is the null finding of whose participants had extremely elevated GGT levels.

The statistical power of analyses reporting null findings when one wishes to assert the proposition of no effect is an issue. We need first to consider what the effect size might be. In this sample and others cognitive differences between impaired alcoholic and nonalcoholic participants can be psychometrically substantial between 0.5 and over 1 standard deviation unit "large" effect sizes in expert said terms. A number of analyses were run addressing power issues. For some variables, the two groups could be combined, and in this situation, there is adequate (>0.80) power for multivariate univariate, analyses. Not one of the differences between the two GGT groups was significant, even at a lenient  $P < 0.10$  level.

## CONCLUSION

In previous demonstrations of an association between liver function and cognitive impairment, liver and neuropsychological status was assessed concurrently or with a short (21 days) interval between them and neuropsychological status was assessed after only brief abstinence from alcohol. There has been no demonstration of a liver function/cognitive status association when persons have been alcohol free for a period longer than 21 days. Perhaps, then, the liver function/impairment relationship holds only acutely. That is, intellectual impairment will only be found when the liver is actively dysfunctional. At the present time, it is difficult to make a case for a relationship between liver dysfunction during the active drinking phase and the enduring cognitive dysfunction found in some abstinent alcohol abusers.