

Neuropsychological and Psychiatric Aspects Of Subclinical Hepatic Encephalopathy

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Abstract

The sample of this study consisted of 24 patients with age range of 5-15 years suffering from non-alcoholic non-active liver cirrhosis and 20 normal control subjects matched for age, sex and education with the patient group. They were subjected to medical, neuro-psychological and psychiatric assessment. The neuro-psychological testing involved testing of both the performance ability, which was impaired in-patients, and the verbal ability, which was preserved. The different medical parameters whether clinical signs and symptoms or laboratory investigations were tested for correlation with the neuro-psychological abnormalities and no correlation were found except with prothrombin. Psychiatric assessment includes clinical mental status examination, psychiatric rating scale and personality assessment forms. Individual psychiatric symptoms which detected by clinical mental state examination did not show significant differences between the patients the and control subjects, although psychiatric symptoms in general were significantly more in the patients. However, the use of the brief psychiatric rating scale revealed the prevalence of some psychiatric symptoms more significantly in the patients than the control subjects. Personality assessment revealed that generally, patients were more emotional, anxious and easily provoked. However, there is no evidence that these psychiatric symptoms and personality characteristics could explain the existing neuro-psychological abnormalities. This study concluded that cases of subclinical hepatic encephalopathy significantly detected by neuro-psychological testing might have particular psychiatric and personality profile, which is not manifest by clinical mental state examination, but clinical psychiatric scales could reveal it.

Introduction:

The association between liver disorder and mental disturbance has been recognized since the time of Hypocrites, who noted that "those whose madness results from bile shout, play tricks and will not keep still" (Chadwick & Mann, 1950). Scientific investigations of the links between hepatic and mental symptoms began in the 19th century (Walshe, 1951). By the 1950s, detailed accounts of the neuropsychiatric symptoms associated with liver disease had appeared (Summerskill et al., 1956).

Great attention was paid to hepatic encephalopathy; a condition found to complicate most forms of liver disease.

Hepatic encephalopathy is a complex neuropsychiatric syndrome characterized by augmented neural inhibition, which is associated with acute, subacute, or chronic hepatic failure. It involves derangement in mental functions ranging in severity from intellectual impairment detectable only by careful psychometric testing to coma (Gibertstadt et al., 1980 ;Sherlock,1985). It was also possible to be diagnosed in the absence of overt clinical signs or symptoms if there are any cognitive deficits or neuropsychological findings, which indicate such cerebral disorder. Thus, these patients were described by many studies as having a

“latent” or “sub-clinical” condition of hepatic encephalopathy (Rikkers et al., 1978; Tarter et al., 1989; Sood et al., 1989) or “hepatic minimal encephalopathy” (Eisenburg, 1996).

Most of these studies focused on patients with hepatic cirrhosis and reported that they might have mental impairment even when clinical examination is normal (Schomerus et al., 1981). Tarter et al., (1984) found that individuals with chronic nonalcoholic cirrhosis, despite the absence of overt clinical signs of hepatic encephalopathy, were impaired on neuro-psychological tests that measure visuopractic capacity, visual scanning and perceptual-motor speed. In contrast; intellectual, language, memory, attention, motor and learning abilities were found intact. Recently, McCrea et al., (1996), in a prospective study compared the performance of patients with liver disease against carefully matched normal controls on neuro-psychological test battery. He found that the cirrhotic patients having latent or sub-clinical hepatic encephalopathy exhibited relatively selective deficits in complex attentional and fine motor skills, with preservation of general intellectual ability, memory, language and visuo-spatial perception.

The overall results of these studies conclude that these patients showed a significant impairment in cognitive functions as detected by neuro-psychological testing particularly in the performance rather than the verbal abilities.

Psychometric measures are reported to be significant indicators of sub-clinical hepatic encephalopathy to the extent that they have been reported to be more sensitive than are other biological parameters e.g. electroencephalogram (McClain, 1980). Even subtle cerebral pathology has been

found to be better detected by such Psychometric measures than other routine clinical radiological examination (Goldstein, 1973).

It was noted that research in the field of psychiatric aspects of liver disease concentrated on the organic rather than the functional aspects of the problem. Little on this subject has been published in the psychiatric literature particularly studies on children. Collis and Lloyd (1992) commented on that by stating that the psychiatric consequences of liver disease had been relatively neglected by the psychiatric literature with the exception of the extensive descriptions of the cognitive impairments associated with hepatic encephalopathy.

However, the emotional accompaniments of liver disease are assuming greater significance, especially now that the prognosis of fulminating and chronic disease has been radically improved following the establishment of liver transplant programs.

This study was done to fulfill the following aims:

1. Testing for the previously reported findings in a group of non-alcoholic non-active cirrhotic children and early adolescents.
2. Psychiatric and personality assessments besides the neuro-psychological assessment: As mentioned before, most of the previous studies have been focusing on the neuro-psychological assessment with relatively neglecting the psychiatric (functional) aspect of the problem.

Material and Methods

In this study, 24 patients with hepatic, non-active non-alcoholic cirrhosis (Group 1)

were consequently admitted to the liver unit of Pediatric department in Mansoura University Hospital. 15 of them were males (62.5%) and 9 were females (37.5%). Their ages ranged from 5-15 years.

Twenty children without liver, kidney, metabolic, psychiatric disorder or other major diseases, with age range of 5-15 years were selected as controls (group 11). Both groups were matched for age, sex and education.

Selection Criteria:

1. Absence of any clinically detectable cerebral dysfunction (i.e. grade 0 by Parsons-Smith et al., 1957).

2. Absence of clinically diagnosed psychiatric disorder.

3. No previous history of hepatic encephalopathy, neurological or psychiatric disorder.

4. All patients were in child's B grade of liver disease (7-9 points on the functional categorization of cirrhosis patients based on Pugh's modification of child's score (Pugh et al., 1973).

All patients and control children were subjected to the following:

Psycho-organic Assessment:

Evaluating both the medical condition and the psychological performance was done by different clinical and investigation tools and by applying various neuro-psychological tests detecting psychological cerebral dysfunction. The following procedures were done:

1. Clinical medical examination

2. Laboratory investigations:

a. Routine tests: Complete blood picture (CBC)

b. Liver function tests:

- Total serum bilirubin
- Serum albumin
- Prothrombin time
- Serum enzymes:
- Aspartate aminotransferase (AST)
- Alanine aminotransferase (ALT)

3. Abdominal sonography

4. Histo-pathological examination of liver biopsy specimens (only for patients)

5. Neuro-psychological testing using:

a. Wechsler intelligence scale for children (Wechsler, 1981)

Three sub-tests of the Wechsler intelligence scale were used:

i. Digit span (forward and backward): The ability of reciting increasingly numbers of digits mentioned to the subject both forward and backward .

ii. Coding test (Digit symbol in adults): The ability of pairing arbitrarily assigned symbols with numbers

iii. Test of Similarities: The ability of telling in what way pairs of items are similar.

b. Trail-making Test: using its two forms; Trail A and Trail B (Reitan, 1958)

“Trail A: The task is to connect the numbers in proper sequence by drawing a line from one circle to the next until joining all the circles and recording the time taken

“Trail B: Connecting the circles in sequence alternating back and forth between numbers and letters of alphabet (1,A - 2,B - 3,c - 4,d ...etc.)

c. The Picture Intelligence Test “PIT” (Saleh, 1978): Assessing the ability of finding out from multiple sets of pictures

(each consists of five similar pictures) the different one.

Functional Psychiatric Assessment:

The clinical psychiatric status was evaluated by clinical psychiatric examination and by the assessment of the symptom and personality profiles using clinical psychometric scales.

The following procedures were performed:

1. Clinical psychiatric examination focusing on detecting any existing psychiatric symptoms (clinical judgment).
2. Applying the Brief Psychiatric Rating Scale "BPRS" (Overall & Gorham, 1962) searching for and evaluating psychiatric symptoms - if found - (psychometric judgment).
3. Personality assessment using Personality Assessment Form "PAF" (Shea et al., 1987). Because of the heterogeneous nature, the small size of the sample and the early age, clustering of categories was done to reduce sources of errors, make small group comparisons easier and overcome the difficulty of defining a single specific personality disorder particularly in young age. This clustering was also recommended by Korenblum et al (1987) who reported that - frequently - a single specific personality disorder can be hardly found and thus, they clustered categories of personality disorders in a group of early adolescents into:
 - i. Cluster A: paranoid, schizoid, and schizotypal.
 - ii. Cluster B: histrionic, narcissistic, and borderline.
 - iii. Cluster C: antisocial (including conduct disorder)
 - iv. Cluster D: avoidant, dependent, compulsive and passive aggressive.

v. Cluster E: Mixed atypical other

Statistical Methods:

Data were collected and subjected to statistical processing using SPSS computer package under windows on IBM compatible PC (personal computer).

Results

Table (1) shows the psychometric test results in the patients and control subjects. It indicates that the Coding test (Digit symbol in the adults) had the highest statistically significant difference between patients and control subjects ($p=0.0003$) followed by the Trail-making test ($p=0.001$) then the Picture Intelligence Test ($p=0.002$). On the other hand, the tests of Similarities, the Forward Digit Span and the Backward Digit Span did not show statistically significant differences between both groups.

Table (2) shows the correlation between the Coding Test (digit symbol in adults), which had the highest statistical significance and the other neuro-psychological tests. As shown, the highest correlation was found with the Trail-making test ($r=0.74$, $p=0.0005$) followed by the picture intelligence test ($r=0.55$, $p=0.006$) then the Forward Digit Span ($r=0.51$, $p=0.01$). There was no statistically significant correlation with the Backward Digit Span or Similarities Test.

Table (3) shows that there was no correlation between scores of the Coding Test "digit symbol and different clinical medical parameters with the exception of prothrombin level ($r=0.51$, $p=0.01$).

Table (4) shows psychiatric symptoms that were encountered by clinical judgment. None of the patients or control subjects had a clinical diagnosis of any psychiatric

disorder due to exclusion by the selection criteria of patients and control subjects. Out of the 24 patients, 10 (41.7%) were found to have psychiatric symptoms compared to 3 out of 20 (15 %) of the control subjects and the difference between both groups was statistically significant ($X^2=3.73$). Although the psychiatric symptoms were found more in-patients than control subjects, yet the differences were not statistically significant.

Table (5) shows the psychiatric symptoms encountered by BPRS (brief psychiatric rating scale) in both patients and control groups. No one of either groups had a symptom with severity greater than 3 (moderate) except one patient who had been rated 4 (moderate severe) on the symptom of somatic concern and hypochondriasis. Otherwise most of the patients or control subjects who had symptoms were rated in the range of 1-3 (very mild to moderate). With the exception of one symptom

(depressed mood, sorrow and sadness) all the other symptoms encountered by the brief psychiatric rating scale had significantly higher scores in patients than in control subjects. The total symptom score was significantly greater in patients (mean=6.5 $\pm$ 52.92) than control subjects (mean=3.05 $\pm$ 1.39).

Table (6) shows distribution of personality disorders among patients compared to control subjects as clusters each of which comprises different personality categories as previously shown. Only cluster D had a statistically significant difference between both groups ($X^2=4.28$) which means that patients had more (29.2%) avoidant, dependent, compulsive and passive aggressive personality disorders than control subjects (5%)

Table (1):

Neuro-psychological Test Results (As Mean Rank) In The Patient Compared To Control Groups

The Test	Mean Rank		Z	P
	Patient	Control		
Picture intelligence	16.08	27.85	3.07	0.002 **
Trail-making	28.98	17.1	3.21	0.001 **
Digit span (backward)	19.44	24.38	2.3	0.2
Similarities	22.7	24.1	1.3	0.76
Coding test (Digit symbol)	16.52	29.67	3.58	0.0003 **
Digit span (forward)	21.67	23.19	0.39	0.69

Table (2):
Correlation Between the Coding test (The Most significant Neuro-psychological Test)
and Other Neuro-psychological Tests

Neuro-psychological Test	Forward Digit span	
	Correlation Coefficient (r)	P
Digit span (backward)	0.37	0.08
Trail-making	0.74	0.0005 ***
Digit span (forward)	0.51	0.01 *
Similarities	0.41	0.06
Picture intelligence	0.55	0.006 *

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Table (3):
Correlation Between The Coding Test (The Most Significant Neuro-psychological Test)
and Clinical Medical Parameters

Medical Parameter	Forward Digit Span	
	Correlation Coefficient (r)	P
Age	0.11	0.61
Size of the right lobe of liver	0.16	0.45
Size of the left lobe of liver	0.16	0.44
Size of the spleen	0.37	0.07
Albumin	0.09	0.68
Bilirubin	0.05	0.83
Alkaline phosphatase	0.12	0.57
SGPT	0.03	0.89
Prothrombin	0.51	0.01*
SGOT	0.02	0.93

Table (4):
Psychiatric Symptoms Encountered By Clinical Assessment

Psychiatric Symptoms	Patients		Control		X ²
	NO	Yo	NO	Yo	
Detected Psychiatric Symptoms	10	41.7	3	15	3.73 *
Nervousness and increased reactivity	4			5	1.47
Emotional withdrawal	1			0	0.85
Depressed mood	2	8.3	1	5	0.19
Guilt feelings	0	4.2	0	0	-
Aggressive behavior	1	4.2	0	0	0.85
Suspiciousness	0	0	1	5	11.23
Irritability and agitation	3	12.5	0	0	1.7
Misinterpretations	4	16.7	1	5	1.47
Hypochondriacal symptoms	2	8.3	2	10	0.04
Obsessive Ideas, Rituals & Phobias	3	12.5	1	5	0.47
Anxiety	3	12.5	2	10	0.36

*p<0.05 (significant)

Table (5):
Psychiatric Symptoms Encountered by BPRS (brief psychiatric rating scale)

Psychiatric Symptoms	Patients		Control		t
	Mean	± SD	Mean	± SD	
Somatic concern and hypochondriasis	1.63	1.28	0.65	0.75	3.01''
Anxiety, worry and fear	1.5	1.18	0.75	0.72	2.48*
Tension, overactivation and nervousness	1.38	1.1	0.55	0.51	3.09''
Depressed mood, sorrow and sadness	0.75	0.68	0.55	0.51	1.09
Hostility and contempt	1.17	0.92	0.5	0.69	2.68''
Total Score	6.5	2.92	3.05	1.39	4.84*

*p<0.05 (significant)

Table (6):
Personality Disorders (Clustered) In Patients Compared to Controls

Personality	Patients		Control		X ²
	NO	%	NO	%	
Cluster A	4	16.7	2	10	0.41
Cluster B	3	12.5	3	15	0.06
Cluster C	2	8.3	1	5	0.19
Cluster D	7	29.2	1	5	4.28*
Cluster E	4	16.7	5	25	0.47

*p<0.05 (significant)

Discussion

Collis and Lloyd (1992) stated that the psychiatric consequences of liver disease had been relatively neglected by the psychiatric literature with the exception of the extensive descriptions of the cognitive impairments associated with hepatic encephalopathy. Most of the studies about the psychiatric aspects of liver disease focused on the assessment of the organic mental status through applying various sets of neuro-psychological tests.

Individuals with chronic nonalcoholic cirrhosis, despite the absence of overt clinical signs of hepatic encephalopathy showed signs of neuro-psychological impairment on neuro-psychological testing in many studies. The overall results of these studies concluded that these patients showed a significant impairment in cognitive functions as detected by neuro-psychological testing particularly in the performance rather than the verbal abilities. These patients were described as having some form of subclinical hepatic encephalopathy.

In this study, the Coding Test (digit symbol in the adults) had the highest statistically significant difference between patients and

control subjects followed by the Trail-making and Picture Intelligence tests.

Meanwhile, neither the test of Similarities nor the Digit Span showed statistically significant differences between both groups. In other words, performance ability (measured by the Coding test "Digit Symbol" and Trail-making test) besides perceptual ability (measured by the Picture intelligence test) had been found to be significantly impaired in non-alcoholic cirrhotic patients with subclinical hepatic encephalopathy. On the other hand, the verbal ability (measured by the tests of Similarities and the Digit Span) was preserved as shown by the absence of significant differences between patients and control subjects.

Having the highest statistical significance, the Coding Test "digit symbol in adults" which measures performance ability was tested for possible correlation with other performance and verbal tests. It was highly correlated with performance and perceptual tests; Trail-making and picture intelligence tests respectively. On the other hand, it did not have a similar correlation with the tests of verbal ability. This confirms the finding of this study and other studies that the

neuro-psychological impairment in subclinical hepatic encephalopathy was detected in the performance and perceptual rather than the verbal abilities.

The impairment of performance with preserved verbal abilities which was found in this study came in agreement with many other studies (Ridders et al., 1978; Sarin et al., 1987; Taeter et al., 1987 and Sood et al., 1989). The neuro-psychological impairment in spite of the absence of overt clinical and mental abnormalities indicate the lack of sensitivity of neuro-logical and bedside mental status examination in detecting cerebral dysfunction (Gitlin et al., 1986). Meanwhile, the preserved verbal ability could account for masking the neuro-psychological impairment which indicate the significance of using neuro-psychological testing to detect cases of latent subclinical hepatic encephalopathy.

Different sets of tests were used in different studies although all of them had the same target, which was assessment of both the verbal and performance abilities. As just mentioned, the performance tests were the more significant in this study as well as other studies. They have been used differently in different studies and their relative efficacy in detecting cases with subclinical hepatic encephalopathy were not the same probably due to methodological and sample differences. In this study, the Coding Test was superior to the Trail-making Test (both were used to assess the performance ability) and following them, came the picture intelligence test (which was used to measure the visual perceptual ability). In other studies (Sood et al., 1989), the block design test, which assesses the visual-spatial motor functioning, was superior to the digit symbol test. Koch et al. (1990) could obtain the best discrimination

between patients and control subjects by testing for the reaction time to white and colored light with a reaction time apparatus and with the digit symbol (Coding test in children) and also with the block design test. McCrea et al. (1996) used a comprehensive neuro-psychological test battery and found that cirrhotic patients with subclinical hepatic encephalopathy exhibited relatively selective deficits in complex attention and fine motor skills, with preservation of general intellectual ability, memory and language. They suggested a subcortical patho-physiology possibly reflecting involvement of the basal ganglia. A related test for Trail-making test called "The Number Connection Test" was used in many studies (Conn, 1977, Sood, 1989 and Quero et al., 1996) gave similar results as that given by Trail-making Test.

The neuro-psychological test results from this study were tested for probable correlation with clinical medical parameters including clinical medical examination and laboratory investigations. Apart from prothrombin level there was no correlation between any of the other clinical medical parameters and the Coding Test (being the most significant neuro-psychological test in this study). This finding was confirmed by reports from many other studies which could not find any correlation between the neuro-psychological abnormalities and hepatic function status (Ridders et al., 1978; Gitlin et al., 1986 and Sood et al., 1989).

However, there is controversy in the literature regarding the correlation between hepatic function derangement and the degree of psychometric test abnormalities. While in this study and the later studies previously mentioned no correlation was found (except for prothrombin in the present study), but others as (Gilberstadt et

al., 1980) found a significant correlation. Collis and Lloyd (1992) reported that a correlation has been shown between the hepatic and neuro-psychological abnormalities when studied in small groups of both alcoholic (Tarter et al., 1986a) and non-alcoholic (Tarter et al., 1989) cirrhotics. Arria et al. (1990) found that serum vitamin E levels were significantly lower in patients who had neuro-psychological impairment than in those who did not have. However, they found that measures of hepatic dysfunction did not distinguish between the two groups. Amodio et al. (1996) reported that Neuro-physiological and neuro-psychological impairment in cirrhotics without overt hepatic encephalopathy were found linked to each other and to hepatic dysfunction.

Thuluvath et al. (1995) found that the neuro-psychological tests correlated significantly with albumin, prothrombin time, Child-Pugh's score, clinical encephalopathy, and ammonia. In this study, the only medical parameter correlated with the neuro-psychological test was prothrombin. There is no available explanation for this partial correlation but as previously mentioned there is great controversy and the reports about this point are conflicting. In line with our finding, Walton and Bowden (1997) failed to obtain evidence for general or specific correlation between mental ability and liver function.

In this study, patients were selected with exclusive criteria to rule out any clinically diagnosed psychiatric disorder. However, based on clinical judgment patients were found to have psychiatric symptoms more than control subjects. Although these symptoms were mild to moderate in severity, and the differences were not statistically significant.

Using the Brief Psychiatric Rating Scale (Overall, L. & Gorham, R., 1962); somatic concern, hypochondriasis, worry, fear, anxiety, hostility and contempt which were found significantly more in patients than control subjects. The total score was also significantly more in-patients than control subjects. The difference between clinical judgment and assessment may be due to the low-grade severity of symptoms and indicates the significance of psychometric assessment in such cases.

Using the Personality Assessment Form (Shea et al., 1987); personality categories were clustered to reduce errors due to factors like small sample and the difficulty to define a specific single personality category in such young age. Cluster D, which comprised the avoidants, dependents, compulsives and passive aggressives - was significantly more in patients than control subjects.

Thus, it seems that the patient group could be described as more emotional, anxious and easily provoked.

As mentioned before, less work has been orientated towards the emotional and the functional psychiatric status of patients in general. The term subclinical (latent) hepatic encephalopathy used to refer to a condition in which patients with cirrhosis, regardless of its etiology, demonstrate a number of quantifiable neuro-psychological defects, yet, on clinical examination, have a normal mental and neuro-psychological status (Sood et al., 1989). The condition was extensively studied on the basis of neuro-psychological testing rather than the clinical psychiatric assessment. Thus, there is little in the available literature about this point. Collis and Lloyd (1992) stated that the diagnosis of psychiatric disorders in patients with chronic liver disease may be

difficult because hepatic dysfunction often leads to symptoms such as lethargy, fatigue, and anorexia which are also common in depression. Furthermore, the early stages of hepatic encephalopathy may mimic functional psychiatric disorders such as anxiety.

The cirrhosis patients with subclinical (latent) hepatic encephalopathy were reported to have less psychiatric and personality disturbances when compared to chronically ill diseased subjects.

Tarter et al., (1984), reported that the cirrhosis group exhibited less personality and psychiatric disturbances than did the chronically ill disease control Grohn's group.

They concluded that the neuro-psychological deficits identified in the former group were not due to simply emotional disturbances. Akil and Brewer (1995) described multiple psychiatric symptoms in his patients suffering from Wilson's disease including personality changes, such as irritability and low threshold to anger, depression, deteriorating of academic and work performance, cognitive impairment, psychosis and anxiety.

Seniow and Czionkowska (1996) reported - about psychiatric symptoms in the same disease - that they are sometimes ambiguous, covering changes in behavior and personality, affective disorders, and deterioration of cognitive functioning.

In this study, the control subjects were normal which may explain the relatively more prevalence of psychiatric and personality changes in the patient group. At the same time, there is no evidence that psychiatric symptoms of such low grade of severity (which were not statistically

significant on clinical judgment) can explain the various neuro-psychological abnormalities. The impact of the original liver disease and other situational factors may underlie these psychiatric disturbances.

Summary and Conclusions

Individuals with chronic nonalcoholic cirrhosis, despite the absence of overt clinical signs of hepatic encephalopathy showed signs of neuro-psychological impairment on neuro-psychological testing in many studies. The overall results of these studies concluded that those patients by clinical examination had a normal mental and neuro-psychological status - yet they showed a significant impairment in cognitive functions by neuro-psychological testing particularly in the performance ability. The verbal ability was almost always preserved. These patients were described as having some form of subclinical (latent) hepatic encephalopathy.

In this study, patients with non-alcoholic non-active liver cirrhosis were subjected to medical, neuro-psychological and psychiatric assessment. The neuro-psychological testing involved testing of both the performance ability which was impaired in patients and the verbal ability which was preserved. The different medical parameters whether clinical signs and symptoms or laboratory investigations were tested for correlation with the neuro-psychological abnormalities and no correlation was found except with prothrombin. These findings were in line with most of the studies in this field. Psychiatric assessment included clinical mental status examination. Psychiatric rating scale and personality assessment form. Individual psychiatric symptoms found in the patients by clinical mental state examination did not differ significantly

from those found in the control subjects. Although, psychiatric symptoms in general were significantly more in the patients than control subjects. However, the application of the brief psychiatric rating scale revealed the prevalence of some psychiatric symptoms more significantly in the patients than the control subjects. Cluster D of personality disorders significantly characterized the patient group. This included: the avoidants, dependents, compulsives and passive aggressives. In general, patients were more emotional, anxious and easily provoked. However, there is no evidence from this study as well as other studies that these psychiatric symptom and personality characteristics could explain the existing neuro-psychological abnormalities. Meanwhile, these personality and psychiatric features - though not out-standing, might put a question mark on the assumption of previous studies that these patients have on clinical examination normal mental status.

To conclude, this study showed the following: Firstly, that the application of neuro-psychological tests could significantly detect cases of subclinical hepatic encephalopathy in a group of children and early adolescence before overt clinical symptoms appear and thus, could help these patients to benefit from long-term treatment. Secondly, personality and psychiatric features might characterize these patients. Although, these features were not striking in this study probably due to the small sample and limitations of age. Further researches are recommended in this direction with larger samples, longer follow-up period and wider range of age and using more comprehensive tools for psychiatric and personality assessment to undermine precisely the question of normal or abnormal mental state in these cases.

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الجوانب الطب نفسية و النفس عصبية فى الاعتلال الدماغى الكبدى الغير ظاهر اكلينيكيًا

هذه الدراسة تمت على ٢٤ مريضاً تترأوح اعمارهم بين ٥-١٥ عاماً يعانون من تليف كبدى غير نشط و غير مسبب بالكحوليات و ٢٠ مريضاً كمجموعة تحكم متماثلة الفسن و الجنس و مستوى التعليم. كل اشخاص الدراسة تم دراستهم و تقييمهم طبياً و نفسياً و لم يوجد اى فرق بين مجموعة المرضى و مجموعة التحكم من الناحية الاكلينيكية برغم ان الاعراض النفسية بوجه عام كانت اكبر بكثير فى مجموعة المرضى اما بالنسبة لتقييم الشخصية فقد وجد ان المرضى كانوا اكثر عاطفة و قلقاً و سهولة فى استثارتهم و برغم ذلك لم يوجد دليل على ان وجود الاعراض النفسية و الصفات الشخصية يمكن ربطها بوجود اضطرابات فى الاختبارات النفسية.

الاستنتاج: الاعتلال الدماغى الكبدى الغير ظاهر اكلينيكيًا و الذى يمكن الكشف عنه بالاختبارات النفسية يمكن ان يكون لها اضطرابات فى الشخصية و اعراض نفسية و التى يمكن عمل اختبارات معينة لها.

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