

## THE IMPACT ON PSYCHOPATHOLOGY AND NEURODEVELOPMENT OF CHILDREN'S OF ALCOHOL DEPENDENT FATHER

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**ABSTRACT: BACKGROUND:** Children of parents with alcohol dependence syndrome are particularly at high risk of emotional and behavioral problems such as learning disability, hyperactivity, psychomotor delays, somatic symptoms and emotional problems. Neuropsychological functions in these children have been the focus of attention over the last decade. **AIM:** Aim of this study was to compare the nature and extent of behavioral and cognitive problems in children of men with and without alcohol dependence. **MATERIALS AND METHODS:** Children of patients with Alcohol Dependence Syndrome, with no known psychiatric illness; aged between 5 and 10 years (Both male & female); with mother having GHQ scores less than 4, formed the study group and control group formed by the children of normal. 108 such Children (54 in Study group and 54 in Control group) were evaluated for psychopathology, neuro development and cognitive functioning. Tools used were: DSM IV criteria for diagnosis of Alcohol Dependence Syndrome, Severity of Alcohol Dependence Questionnaire, General Health Questionnaire (GHQ-28), and Socio-demographic data sheet, Child Behavior Checklist (CBCL), Wechsler Intelligence Scale for Children – IV (WISC-IV), Trail Making Test (TMT) and Neurodevelopment Scale. **RESULTS:** Behavioral, emotional difficulties and Neuro developmental deficits are commonly seen in children of alcohol-dependent parents as they scored statistically significant high scores on Neurodevelopmental Scale, Externalizing subscale and a marginal high score on Internalizing Subscale of CBCL. On the WISC-IV, there was a statistically significant difference in various subtests and indices including verbal comprehension, perceptual reasoning, working memory, processing speed and total intellectual quotient; indicating a global dysfunction. On the TMT, children of alcohol-dependent parents took as much time to do the task as the control group but tended to make more errors and this difference is statistically significant. **CONCLUSIONS:** The current findings indicate that children of alcohol-dependent father are at increased risk for behavioral, emotional and cognitive deficits. Overall intellectual capacity and functioning in the areas of verbal comprehension, perceptual reasoning, working memory, processing speed was severely impaired in these children. Also they had more difficulty with Neurodevelopment tasks and frontal lobe functions.

**KEYWORDS:** Neurodevelopment, Psychopathology, Children, Alcohol dependent fathers.

**INTRODUCTION:** Parental mental illness and its impact on the development and behavior of children has been an active field of research over the last two decades. Children of parents with alcohol dependence syndrome are particularly at high risk for emotional and behavioral problems such as learning disability, hyperactivity, psychomotor delays and somatic symptoms. There have been attempts to study various aspects of children of people with alcohol dependence from India and some published literature is available that looks at various domains in the same sample.<sup>[1,2]</sup> Six

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of the seven studies of parents who were alcohol dependent found some association with child hyperactivity and other childhood conduct problems such as lying, stealing and truancy.<sup>[3,4]</sup> Pihl and Brice.<sup>[5]</sup> reviewed the studies of cognitive functioning in children of alcoholics. They found that these children have lower verbal intelligence, overall poor verbal skills, poor verbal and nonverbal memory and poor abstraction and planning.

Christiansen et al.<sup>[6]</sup> found on the Child Behavior Checklist (CBCL), that among 103 Danish children of alcohol-dependent fathers, there was a significantly greater incidence of symptoms on 17 of the 118 CBCL items. Children and adolescents of parents with alcohol dependence have an increased risk for internalizing problems such as depression, anxiety, substance abuse, and so on or externalizing problems such as opposition, conduct problems (Stealing, lying, and truancy), anger outbursts, aggressively, impulsivity, and again substance abuse.<sup>[7]</sup>

The available literature review indicates that children of parents with alcohol dependence are at risk for a wide range of neuropsychological dysfunction and psychopathology. This study was an attempt to examine the broad areas of dysfunction in children of fathers with alcohol dependence in the Indian context so that early identification and intervention can be planned.

**AIMS:** Aim of this study was to compare the nature and extent of behavioral and cognitive problems in children of men with and without alcohol dependence.

## **MATERIALS AND METHODS:**

**STUDY DESIGN:** Case-Control Observational Study.

**SOURCE OF DATA:** Children of patients with a diagnosis of Alcohol Dependence Syndrome according to DSM IV TR Criteria reporting to out-patient department, Department of Psychiatry, Dr. PDMMC Amravati.

**STUDY SAMPLE:** This study attempted to look at psychopathology and cognitive functioning in a group of children of men with alcohol dependence and compared them with a control group of children of men without alcohol dependence. 108 Children (54 in Study group and 54 in Control group) were evaluated for psychopathology, neurodevelopment and cognitive functioning. The study was approved by the Hospital Ethics Review Board. Informed consent was taken from all the parents of the children who participated in this study.

**INCLUSION CRITERIA:** Children of male patients diagnosed with Alcohol Dependence Syndrome; having no other known psychiatric illness; aged between 5 and 10 years; with mother having General Health Questionnaire (GHQ) scores less than 4 and living with the index parent for at least the preceding year. Both male and female were included in the study. A control group from the pediatrics out-patient department and the school setting was taken with no parental psychiatric illness and mother scoring less than 4 on GHQ.

**EXCLUSION CRITERIA:** Parent having any known organic brain syndromes, mental retardation or any other psychiatric illness, children having any known visual/auditory handicap, children with known chronic medical illness like diabetes, asthma or chronic renal disease.

## TOOLS FOR ASSESSMENT:

1. DSM IV criteria for diagnosis of Alcohol Dependence Syndrome.<sup>[8]</sup>
2. Severity of Alcohol Dependence Questionnaire (SADQ).<sup>[9]</sup>
3. General Health Questionnaire (Goldberg's' GHQ-28).<sup>[10]</sup>
4. Socio-demographic data sheet (developed for the study)
5. Child Behavior Checklist (CBCL) (Achenbach and Edelbrock).<sup>[11]</sup>
6. Wechsler Intelligence Scale for Children – IV (WISC-IV).<sup>[12]</sup>
7. Trail Making Test (TMT) (Luria et al.).<sup>[13]</sup>
8. Neurodevelopment Scale (Lindahl et al.).<sup>[14]</sup>

## METHOD OF DATA COLLECTION:

1. Male patients who fulfill the DSM IV criteria for alcohol dependence coming to the Department of Psychiatry, Dr. PDMMC, Amravati, who had children aged between 5 and 10 years were included in the study.
2. Fathers in the study group were then administered the Severity of Alcohol Dependence Questionnaire (SADQ)<sup>[9]</sup> which is a short, easy to complete, self-administered 20-item questionnaire designed to measure severity of dependence on alcohol. There are five subscales with four items in each: Physical withdrawal, Affective withdrawal, Withdrawal Relief Drinking, Alcohol Consumption and Rapidity of Reinstatement. Each item is scored on a 4-point scale, ranging from "Almost Never" to "Nearly Always", resulting in a corresponding score of 0–3. Thus, the total maximum score possible is 60 and the minimum is 0.
3. Mothers were screened using the General Health Questionnaire (GHQ) (Goldberg)<sup>[10]</sup> for psychopathology. It is a self-rating scale with the severity of symptoms compared to the habitual state of the person in question on a 4-point rating scale. The 28-item version was used in this study. Children whose mothers scored above the cut-off on the GHQ were excluded from the study.
4. Mothers were further interviewed by using a socio-demographic data sheet and the Child Behavior Checklist (CBCL; Achenbach and Edelbrock)<sup>[11]</sup> which is a descriptive instrument designed to classify behavioral and emotional disorders of children aged 4 through 16 years comprehensively. Each of the 113 items is scored on a 3-step response scale: 0, not true; 1, sometimes true; and 2, often true. The two broad band groupings of behavioral problems assessed correspond to the internalizing and externalizing behavior.
5. Children were assessed on the Wechsler Intelligence Scale for Children – IV (WISC-IV)<sup>[12]</sup> which is an updated version of the previous Wechsler scales for children (WISC, WISC-Rand WISC-III). It provides information about the child's overall intellectual capacity (IC Total) and functioning in the main areas of intelligence (verbal comprehension, perceptual reasoning, working memory and processing speed). The scale includes 15 subtests, 10 primary and 5 optional.
6. The Trail Making Test is a test of controlled attention and is widely used as a screening device, a test of laterality: a test of perceptuo motor functions and is a sensitive measure of frontal dysfunction. The test consists of a set of numbers (1–16) and alphabets (A–P)

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randomly spread on a sheet of paper. The child is asked to alternate between alphabetical and numerical sequence (1-A, 2-B, etc.). The total time taken and the number of errors made are recorded.

7. The final test done with the children was the Neurodevelopmental Examination (Lindahl et al)<sup>[14]</sup> which is used in children of age between 5 and 9 years. This examination consists of 21 tasks which range from an evaluation of the child's auditory and visual acuity to threading wooden beads within a time limit. It is a sensitive indicator of neurological compromise and is known to pick up subtle deficits. Each item was scored 0, 1 or 2: 0 score if normal, 1 if uncertain or mildly abnormal and 2 if abnormal. The maximum score is 40 and a score of 8 and above is considered significant and indicates dysfunction.
8. All the data obtained were analyzed after loading on to SPSS and using the student's "t" test. A comparison of all the parameters was made between the study and the control group.

**RESULTS:** Out of 127 Children who were screened for the study, 19 children had to be excluded due to no formal education in child (n=9), child unable to come for completing the assessment (n=6) and mothers scoring high on the GHQ (n=4). Out of 108 children included in the study, 54 (29 boys and 25 girls) were in the study group and 54 (26 boys and 28 girls) were in the control group.

Age	n	Mean (years)	SD	"t"	Significance
COA	54	7.4	2.31	1.655	NS
CON	54	7.7	2.79		

Table 1: Socio-demographic profile of the sample (age)

COA - Children of alcohol-dependent fathers; CON - Children of normal; as can be seen in Table 1, there were no significant differences between the two groups with respect to age of the child.

Sex	Children of alcoholics (n=54)	Children of Normal (n=54)
Male	29	26
Female	25	28

Table 2: Socio-demographic profile of the sample (sex)

Table 2 reveals no differences between two groups with respect to sex of the child.

Child Behavior Checklist (CBCL)	n	Mean	SD	df	"t"	Significance
Internalizing scale: COA	54	5.86	2.58	30	1.15	NS
CON	54	4.43	3.76			
Externalizing scale: COA	54	8.96	4.88	30	3.37	P < 0.01
CON	54	5.78	5.23			

Table 3: Mean scores obtained by the two groups on the CBCL

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COA - Children of alcohol-dependent fathers; CON - Children of normal; Table 3 shows the mean scores obtained by the two groups on two Subscales of CBCL- the Internalizing and the Externalizing Scale. As can be seen, COA obtained statistically significant high scores on the externalizing scale and a marginal high score on Internalizing Scale (although statistically insignificant) than CON group.

<b>Subtests &amp; Indices of WISC-IV</b>	<b>COA (n = 54) (Mean±SD)</b>	<b>CON (n = 54) (Mean±SD)</b>	<b>"t"</b>	<b>p</b>
Blocks subtest	7.08±2.55	09.85±2.67	-2.50	0.042
Similarities subtest	5.51±2.95	10.13±3.57	-3.54	0.001
Digit Span subtest	7.34±3.22	12.15±2.72	-3.91	0.001
Picture Concepts subtest	7.38±3.61	12.89±2.72	-3.78	0.001
Codes subtest	8.17±3.17	10.57±2.14	-2.88	0.056
Vocabulary subtest	5.79±3.12	11.57±3.45	-4.97	0.000
Letters-Number sequencing subtest	7.16±3.42	11.67±4.21	-3.19	0.002
Matrices subtest	6.94±3.56	9.35±3.26	-3.96	0.038
Comprehension subtest	5.11±2.38	10.95±2.34	-5.19	0.001
Symbol Search subtest	7.15±2.62	11.65±2.94	-5.07	0.001
Picture Completion subtest	6.94±3.25	11.15±3.39	-3.41	0.001
Animals subtest	8.77±4.25	10.34±3.19	-2.53	0.122
Information subtest	6.99±3.11	09.85±2.45	-2.70	0.091
Arithmetic subtest	7.23±4.01	11.98±3.66	-3.48	0.001
Reasoning subtest	8.30±2.68	09.44±3.74	-2.14	0.121
VCI = Verbal Comprehension Index	17.54±7.85	33.15±8.28	-5.62	0.001
PR I = Perceptual Reasoning Index	19.83±8.58	31.45±7.45	-2.84	0.001
WMI = Working Memory Index	13.72±6.98	21.28±6.24	-5.10	0.001
PSI = Processing Speed Index	14.67±5.89	23.17±3.67	-4.41	0.001
IQ_TI = Total Intellectual Quotient Index	71.3±23.19	111.7±17.7	-5.92	0.001

**Table 4: Scores obtained by two groups on Subtests & Indices of WISC-IV**

COA - Children of alcohol-dependent fathers; CON - Children of normal; Table 4 shows the results obtained by two groups on WISC-IV which reveals statistically significant differences on the similarities, digit span, picture concepts, vocabulary, letter-number sequencing, comprehension, symbol-search, picture completion and Arithmetic subtests and verbal Comprehension, perceptual reasoning, working memory, processing speed and total intellectual quotient indices. In all cases, COA scored lower than CON group.

<b>Trail Making Test</b>	<b>COA (n=54)</b>	<b>CON (n=54)</b>	<b>"t"</b>	<b>Significance "P"</b>
<b>Time (in seconds)</b>				
1. <300	09	15		
2. 300 - 400	32	27		
3. >400	13	12		
<b>Mean±SD</b>	387.63±81.86	310.17±129.16	1.76	NS

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Errors				
1. No error	02	15		
2. Up to 2 errors	06	27		
3. 2 – 5 errors	25	07		
4. > 5 errors	21	05		
<b>Mean ± SD</b>	<b>6.2±3.17</b>	<b>1.7±2.58</b>	<b>3.26</b>	<b>P &lt; 0.001</b>

Table 5: Scores Obtained by the Two Groups on Trial Making Test

Table 5 shows the mean scores obtained by the two groups on the TMT; there was a statistically significant difference between the two groups in the terms of the errors made – COA made more errors although they took a similar amount of time to do the task.

Neurodevelopment Scale	COA (n=54)	CON (n=54)	"t"	Significance "P"
Score				
< 8	09	15		
8 - 14	32	27		
15 - 23	13	12		
> 24				
<b>Mean ± SD</b>	<b>8.3 ± 3.14</b>	<b>4.7 ± 2.23</b>	<b>3.87</b>	<b>P &lt; 0.001</b>

Table 6: Scores obtained by two groups on Neuro-developmental Examination

Table 6 contains the scores obtained by two groups on the Neuro-developmental Examination, in which COA scored higher, indicating more difficulty with Neuro-developmental tasks compared to CON and the difference was statistically significant.

### DISCUSSIONS:

1. There were no age or sex differences between the two groups.
2. Behavioral and emotional difficulties are commonly seen in children of alcohol-dependent parents and substantive findings exist in literature. In the present study, we used the CBCL as a tool for assessment of behavioral problems and we have found that the children of alcohol-dependent parents obtained statistically significant high scores on the externalizing subscale and a marginal high score on the Internalizing Scale. Other authors have also found, with larger samples, that children of alcohol-dependent parents, especially daughters of alcohol-dependent parents, scored higher than controls on the CBCL.<sup>[5,6,15]</sup> Many Indian studies have also shown higher externalizing behaviour in children who are at high risk for alcohol dependence compared to those at low risk.<sup>[16]</sup> It was found that the children of alcohol-dependent parents had particular difficulties with handling frustration, were irritable and need extra supervision that can be due to both intrinsic as well as extrinsic reasons.
3. On Neurodevelopmental Examination, children of alcohol-dependent parents scored higher, indicating more difficulty with Neurodevelopmental tasks compared to children of normal and the difference was statistically significant. This is an interesting finding as most studies in this area have looked at specific skills. <sup>[10,11,16,17]</sup>

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4. On using the TMT, children of alcohol-dependent parents took as much time to do the task as the control group but tended to make more errors and this difference is statistically significant. This decision of choosing speed over accuracy is a function of the frontal lobe and frontal dysfunction is well known in children of alcohol-dependent parents. <sup>[8,10,17]</sup> In addition, as seen on the CBCL, impulsivity was also found to be a significant factor differentiating children of alcohol-dependent parents from normal children. This impulsivity may also be reflected in the choice of doing a task quickly rather than accurately.
5. On the WISC-IV, there was a statistically significant difference on the similarities, digit span, picture concepts, vocabulary, letter-number sequencing, comprehension, symbol-search, picture completion and Arithmetic subtests and verbal comprehension, perceptual reasoning, working memory, processing speed and total intellectual quotient indices; indicating a global dysfunction. Assessment of cognitive dysfunction using the Wechsler scales has shown significant differences in previous studies as well. <sup>[9]</sup> The present study is based on a small sample and cannot make causative links but this is an area that needs further research.
6. Thus, our study adds to an extensive body of literature showing that there is increased psychopathology in the form of increased externalizing behaviour, difficulties in neurodevelopment and frontal lobe functions in children of alcohol-dependent fathers when compared to normal controls.

**CONCLUSIONS:** The current findings indicate that children in families where there is an alcohol-dependent father are at increased risk for behavioral, emotional problems and cognitive deficits and for this substantive findings exist in literature. Overall intellectual capacity and functioning in the areas of verbal comprehension, perceptual reasoning, working memory, processing speed was severely impaired in these children indicating global dysfunction. Also they had higher scores on the neurodevelopment scale and made more errors on the Trail Making Test. Thus the present study endorses these findings in the Indian context and suggests that children of men with alcohol dependence have difficulties with frontal lobe functions and Neurodevelopmental tasks. In addition, this is a group at risk and preventive strategies like early assessment and intervention in the form of family therapy, parent training and education, play therapy, social skills training, and coping skills training either in individual or group therapy in an outpatient, school or in-home therapy setting can be helpful.

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