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Study of Family Environmental Status of Children and Adolescents Suffering From Attention Deficit Hyperactivity Disorder with Comorbid Disruptive Behaviour Disorder

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Abstract: Attention Deficit Hyperactivity Disorder (ADHD) is a common neuro developmental disorder in children. Most common comorbidity is Disruptive behaviour disorder. Family and social environmental factors are not considered as having etiological role but may exacerbate pre-existing symptoms and genetic or neurological vulnerability. These children are particularly challenging and require intensive intervention to prevent greater morbidity and impairment. This study aims to see whether family adversity is related to ADHD with Conduct disorder. This case –control, cross sectional study was done in a child Guidance clinic of Psychiatry department of R.G Kar Medical College, Kolkata. Children diagnosed as ADHD with co morbid DBD fulfilling the inclusion and exclusion criteria were selected as cases (N=32). Control population was collected from schools of both rural and urban areas who did not have any psychiatric disorder (N =62). The consenting parents of the cases and control were interviewed with a standardized questionnaire named Family Environmental scale (F.E.S). Significant differences were found in all variables. The control group family has shown more cohesion, more acceptance and caring, more expressiveness, more independence, more family organisation and control, enjoyed more active recreational orientation but less family conflict. The cases, ADHD with co morbid ODD or CD have shown high family conflict.
Keywords: ADHD, Disruptive behaviour Disorder, Family environment.

INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is the most common neurobehavioral disorder of childhood and among the most prevalent chronic health condition of school aged children. The clinical finding of distractibility, impulsivity and hyperactivity are the characteristic features of ADHD. ADHD is of three types -Inattentive type, Hyperactivity type and combined type.

It is a dysfunction or failure in the brain circuitry that monitor inhibition and motor control. The loss of self-regulation that impairs other brain functions that is crucial for maintenance of attention [1]. The etiology of ADHD is unknown. It is believed to be a complex interaction of genetic, social environmental and biological risk factors [2].

Postnatal social environment is studied as risk factors for development of ADHD. Chronic exposure to exceptional social environments early on during development can increase the risk for ADHD like pattern. Claim that parenting is implicated in the cause of ADHD is controversial. Whereas children reared with extreme neglect and abuse may be at increased risk for ADHD, variation in parenting style within the normal range has been assumed not to play a part [4]. Negative & hostile response from parents may be evoked due to the child's hyperactivity [5].

A lack of positive parenting behaviours such as expression of sensitivity, acceptance and positive guidance, warmth, involvement, was reported to be related to externalising problem in pre-schoolers [6].

High level of negative parental control such as harsh discipline, intrusiveness, negativity and hostility also proved to be associated with externalising problem [7].

Early externalizing problems are predictive of other forms of psychopathology and often interfere with the child's personal, social and academic development [8]. Although developmental psychopathologist now generally assumes such problems to have their roots in children's early developmental history, early identification of children at serious risk of developing such pathology is hampered by a lack of insight into the determinants leading later maladaptive outcome [9, 10].

Specific parenting characteristics highly influence the clinical severity, psychiatric co morbidity and impaired functioning of children with ADHD. It has been shown that parenting style significantly moderates the association of ADHD with other psychiatric symptoms. Specifically, maternal over protection predict higher anxiety, depression, conduct disorder, antisocial, and borderline symptoms, whereas paternal affection and warmth interact with ADHD symptoms to predict lower anxiety, reduced Conduct disorder(CD) and antisocial symptoms [11].

However, the very limited evidence from good longitudinal studies does not support the idea that this increases the likelihood of ADHD onset or persistence rather it predicts the onset of later comorbid conduct disorder and depression [12,13].

However, the fact that parent training can significantly reduce core ADHD symptoms in pre-schoolers highlights the potential power of social environment to influence the course of ADHD [14].

In summary, in ADHD, working hypothesis is that, genetic and environmental influences of small effect, likely act together to create a spectrum of neuro biological risk [15].

ADHD often co exists with oppositional defiant disorder (ODD), Conduct disorder (CD), Learning disorder (LD), Anxiety disorder, Depression, Epilepsy, Tic disorder, Mental retardation etc. At least 1/3 of ADHD children present with co-morbid ODD, ¼ of them with CD [16].

These Co Morbid groups have different risk factors, different course and treatment response. The risk factors which have been studied are stress, caused by poverty, neglect or abuse, diet, perinatal condition, in utero exposure to nicotine, alcohol, cocaine exposure to toxins etc.

Social factors are not considered as having etiological role but may exacerbate pre-existing symptoms, and genetic or neurological vulnerability.

Children who have both ODD/CD and ADHD have more varied and severe ODD/CD symptoms, greater levels of parental psycho pathology, more conflictual interaction with parents, greater peer problems, school difficulties and poorer prognosis into adulthood than those with either condition alone[18].

Family and genetic study support the idea that children with co morbid ADHD and CD may represent an etiologically distinct subtype [19]. These children are particularly challenging and require intensive intervention to prevent greater morbidity and impairment. Family adversity is related to ADHD combined type and may be related specifically to ADHD symptoms in addition to Conduct disorder symptoms.

Most studies of ADHD did not look at psycho social factors the way it might contribute to the severity and persistence of disorder. So, in this study we intend to see whether the family factors including distinct parenting practices are associated with ADHD with comorbid childhood disruptive behaviour problems.

AIMS AND OBJECTIVES

To identify the family environmental risk factors associated with ADHD with co morbid disruptive behaviour disorder (DBD).

MATERIALS AND METHODS

Study setting

The study was conducted at child guidance clinic of psychiatry department of R.G Kar Medical College.

Type of study

It was a cross sectional observational study,

Duration of study

2 years.

Tools used

- A predesigned pretested semi structured Case history proforma containing identification, baseline information and sociodemographic variables.
- CBCL (child behaviour check list 6 to 18 years)

- FES: (Family environmental scale –by H. Bhatia & N K Chaddha. FES comprises of 69 questions, in eight sub scales looking for 3 major dimension of family functioning. The eight-sub scale or factors are Family cohesion, Expressiveness, Acceptance and caring, Family conflict, Active recreational orientation, Independence, Organisation and control. The sub scales-cohesion, expressiveness, conflict and acceptance and caring comprises of the Relationship Dimensions; independence and active- recreational -orientation comprises of Personal Growth Dimensions: and subscales – organization and control are included in System Maintenance Dimensions.

Inclusion criteria: Children

- Children aged between 9 to 15 years
- Living with both parents,
- Belong to middle socio-economic status
- Belong to Nuclear family
- Have given consent by parents

Exclusion criteria: Children with

- Any sensory deprivation
- Having seizure or other neurological disorder
- Mental retardation
- Having low birth weight
- Children living in slums

METHOD

Children 9 to 15 years of age were screened by Child Behaviour check list (CBCL), parents' version. Patients with symptoms of hyperactivity and attention deficit with symptoms of disruptive behaviour disorder were then diagnosed as ADHD with DBD according to DSM IV.

They were sent for psychological evaluation and IQ testing to rule out mental retardation. The children with average IQ were taken for detail case history.

The consenting parent (mother) of the children was interviewed with Family Environmental scale (F E S) questionnaire to investigate the social and emotional status of the family. F E S questionnaire finds out three dimensions of family functioning which consists of eight factors or variables. These variables had three responses, like low, average and high. These responses were entered in an excel sheet.

Likewise, children up to age 15 years from normal schools with similar socio-economic status and without any psychiatric diagnosis as screened by CBCL, were selected and after parental consent were taken up in the study as control group. The mothers of these children were interviewed using the same F E S questionnaire. The responses are entered into the excel sheet.

STATISTICAL ANALYSIS

Data were transcribed into SPSS 23 and results were analysed using appropriate statistical method.

RESULTS

Total number of 36 children suffering from ADHD along with co-morbid DBD was considered for the study alongside 62 controls. The mean age of male ADHD with co morbid DBD was 9.7 years and that of female was 9.6 years with no significant difference in between. Mean (SD) age of the cases was 9.70 (1.714) years whereas that of control children was 11.71 (0.912) years.

There was no significant difference in representation from different sex and religions both for the cases and controls (Table No.1).

Table-1: Distribution of Socio-demographic characteristics of cases and controls

Demographic characteristics		ADHD+ DBD (%)	Controls (%)
Sex	Male	25 (69.44)	34 (54.84)
	Female	11 (30.56)	28 (45.16)
Religion	Hindu	26 (72.22)	54 (87.10)
	Muslim	10 (27.78)	8 (12.90)

On comparison, all the scores of different components of FES for ADHD+ DBD cases were found to be significantly different from those for controls with Mann-Whitney U Test as depicted in Table 2.

Table-2: Comparison of scores of different components of FES among ADHD+ DBD cases and controls

Components of Family Environment Scale	Median (IQR) Score		P-value
	ADHD+ DBD	Controls	
Cohesion	47 (11.75)	59 (8.00)	0.000
Expressiveness	29 (9.75)	34 (10.00)	0.000
Conflict	36 (10.50)	50 (10.50)	0.000
Acceptance & Caring	37 (13.75)	52 (11.00)	0.000
Active recreational Orientation	26 (4.75)	31 (5.50)	0.000
Independence	29 (5.75)	31 (6.00)	0.000
Family organisation	7 (3.00)	9 (3.00)	0.004
Family control	14 (4.00)	17 (4.00)	0.000

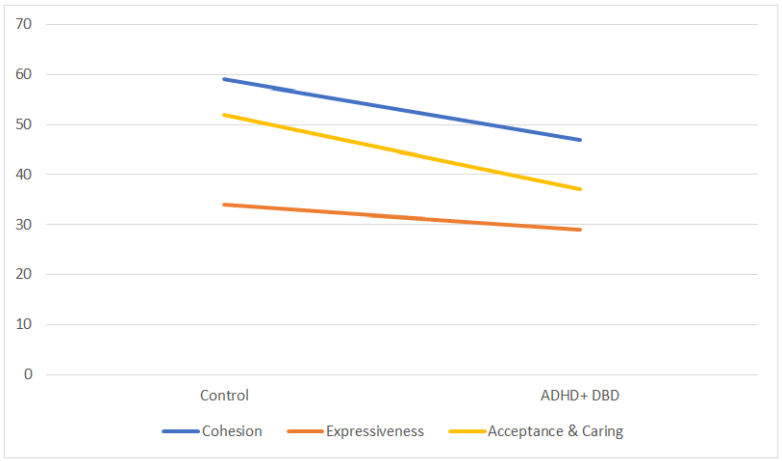

Fig-1: Comparison of median scores of Cohesion, Expressiveness and Acceptance -caring components of FES among ADHD+ DBD cases and controls

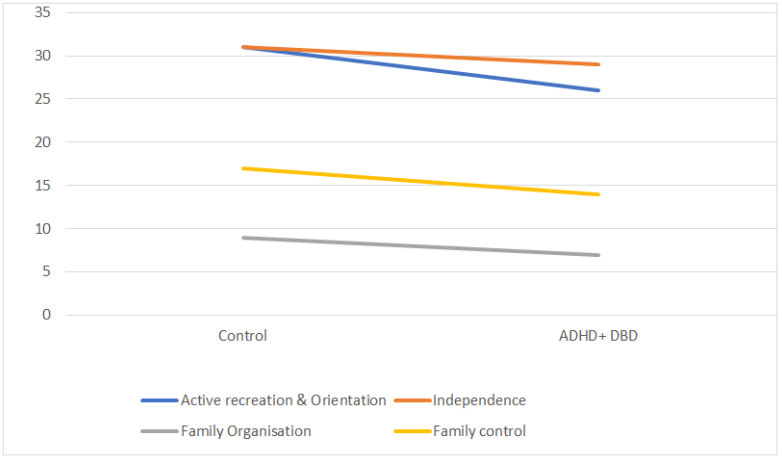

Fig-2: Comparison of median scores of Active Recreation-Orientation, Independence, Family organisation and Family control components of FES among ADHD+ DBD cases and controls

Fig-3: Comparison of median score of Conflict component of FES among ADHD+ DBD cases and controls

The difference in median scores of different components of FES among the ADHD+ DBD cases and control is shown in Fig-1.

Cases scored less in family conflict than control which means more family conflict in cases than control population.

There were less family cohesion, lower expressiveness, less Acceptance and caring, lower

active recreational orientation, less independence and lower family organisation and family control in cases (ADHD with Co morbid DBD) than control.

There was no significant difference in family environmental factors among male and female cases. Family Active recreational orientation was significantly different when compared between Hindu and Muslim cases.

There were 3 cases of alcohol addiction in father and one tobacco addiction in father in male ADHD with co morbid DBD children.

DISCUSSION

The present study aims to assess the influence of family environmental factors on ADHD with co morbid Disruptive behaviour disorder (D.B.D) i.e. Conduct disorder and Oppositional defiant disorder. The other co morbidities of ADHD like depression, learning disorder, tics, mental retardation, anxiety, epilepsy etc were excluded.

The risk factors which could be the confounding variables like very low birth weight, very low socio-economic condition or poverty, residents of slum or very disturbed society, were also excluded from this study.

Children coming only from nuclear and extended nuclear family were taken for this study where relationship between parents and children could be two ways and would be easily understandable. A family is built by reciprocal relationship of its members like parents and children, family rules and maintenance of system.

The family relationship factors are detected by four subscales of FAMILY ENVIRONMENTAL SCALE (FES) like 1) family cohesion 2) expressiveness 3) acceptance and caring and 4) conflict. Independence and Active recreational orientation are two subscales of FES which indicate the growth factors of the family. The other two subscales like Organisation and Control indicate the family system management. Smooth running of a family depends upon the healthy relationship among family members, mainly parents and children; proper management of rules and system and maintaining and controlling of home discipline. Thus, non-chaotic, organised and disciplined family helps in proper growth of family member.

In unsupportive parenting, low or lack of Acceptance and caring and low Expressiveness leads to stress and conflict among parents and children. The behaviour like verbal aggression, hostility and criticism may occur whenever conflict arises in the family. This leads to low bondage or cohesion in and among the family members. Four subscales of FES for detecting Family relationship find out the relationship pattern, lack of free play, very strict and rigid rule more control causes less independence and poor personal growth.

The two subscales Independence and Active Recreational Orientation show the family growth pattern. Intrusive and harsh parenting are associated with DBDs. Likewise lack of monitoring, poor control and lack of consistent rules cause disorganised family situation, which leads to disruptive behaviour. The FES subscales, Organisation and Control determine this family system and management.

When we compared all these variables between case and control population, we found significant difference in all variables. The control group had high to average level of family cohesion, expressiveness and acceptance and caring, in comparison to cases that had low level in all these variables.

There was significantly high conflict in the family of ADHD with comorbid DBD children than control group. Inga Dora Sigfusdottr *et al*. stated that when controlling for financial status and family structure, it was found that ADHD was positively and significantly associated with CD with or without family conflict. But the link between ADHD & CD was significantly stronger for those adolescents who had experienced family conflict. The family conflict moderates the association between ADHD & CD for both girls & boys.

The control group had high to average level of family cohesion, expressiveness and acceptance and caring, in comparison cases that had low level in all these factors.

According to Earth & Bierman in 2006 Exposure to marital conflict was upsetting to children and appears to elicit maladjustment in both direct and in direct way [21]. Negative parent –child relationship was significantly associated with child externalising disorder [22].

Taylor had pointed out the importance of culture, social and family variables in learning to focus attention and control impulsivity and hyperactivity. The process of socialisation may be influenced by characteristic of parents, the child, and the reciprocal interaction between them [23].

Taylor said that parental characteristics can moderate or predict the onset of later co morbid conduct disorder in ADHD children [12].

Family cohesion, as one aspect of family function was negatively correlated with child internalizing and externalizing problems [24]. Children

with less cohesive families were more likely to develop conduct disorder and delinquent symptoms [25].

There was significant difference in other family factors like cases had lower independence, low family organisation and family-control as well as low active recreational orientation when compared with control group.

Harsh parenting includes low acceptance restricted or low expressiveness, low cohesion or bondage, lack of independence, physical and verbal abuse or high conflict between parent and child. Brown G.W et al in 1998 found that harsh parenting had a causal role in childhood in disruptive behaviour [26].

Children who are hyperactive, impulsive and negative in their mood are harder for parents to manage. They are temperamentally difficult children, can result in later disruptive behavioural problem [27, 28]

In a study by Schroeder *et al*. Relationship between executive functioning, family environment and parenting practice in children with or without ADHD were examined. In children normal children higher level of family cohesion, organisation, expressiveness and lesser level of family conflict were significantly correlated with greater behavioural control [29].

Elizabeth A *et al*. stated in their study with children having disruptive behavioural problem that parenting practice with punitive interaction were associated with elevated rates of child disruptive behavioural problem. Low level of warmth was associated with elevated level of oppositional behaviour; physical punishment was linked more specifically with child aggression. These parenting influences were fairly constant across ethnic groups and sex [30].

Rubin *et al*. also stated in similar way, that high level of negative parenting such as harsh discipline, intrusiveness, negativity, and hostility proved association with externalizing problem [7].

Brophy &Dunn6 had similar opinion as lack of positive parenting relate to externalising problem. Johnston C in 1996 showed that observed &parent reported behaviour problem were highest in ADHD with high OD group [30].

CONCLUSION

Family conflict is higher and all other family environmental factors like cohesion, expressiveness, acceptance and caring, independence, active recreational orientation, family organisation and control are lesser in families of the children diagnosed with ADHD and co morbid DBDs when compared with normal children.

Further study is needed to identify family environmental risk factors for development of comorbid ODD and CD in cases with ADHD and also for ADHD without comorbidity so that these behavioural problems can be prevented by controlling these factors.

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