

## Behavioral Problems in Children with Down Syndrome

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*Manuscript received: May 12, 2004, Initial review completed: July, 2004;*

*Revision accepted: January 3, 2005.*

*Forty consecutive children with Down syndrome were included as the Study Group (SG). The Control Group (CG) consisted of forty children attending the immunization clinic in pediatric OPD. Behavior Screening Questionnaire (BSQ) was used to screen the study groups as well as their siblings and control group for behavioral problems. The assessment of parental attitudes was done on Attitude Screening Questionnaire which includes 2 separate questionnaire for mother and father. Twenty-two children (55%) with Down's syndrome showed behavioral problems as compared to 5 (12.5%) in control group. Children with Down's syndrome showed behavioral problems related to all the spheres (feeding, socialization, toilet training and sleep) as compared to control group. Mothers showed highly indulgent attitude as related to feeding to nearly total neglect as related to socialization and toilet training whereas in Paternal Attitude Screening Questionnaire, there was total neglect in all the spheres as compared to control group. There is higher prevalence of psychiatric disorders in children with Down's syndrome and their siblings.*

**Key words:** Behavioral problems, Down's syndrome, Parental attitudes.

**T**HERE are few studies which have analyzed the behavioral problems in children suffering from mental retardation (1-5) and very few on Down syndrome(6,7). Children suffering from Down syndrome have a wide range of psychiatric comorbidity(1-5,7,8), but there is no systematic study from Indian subcontinent.

Not only children suffering from Down syndrome but their siblings and parents are also at risk(2,9). Parental interactions(10-12) and public attitudes(13) also influence the development of children with Down syndrome and comorbidity. Taking into account the paucity of scientific data on Down syndrome, the present study was undertaken with the aims to study the-pattern of behavioral problems in children with Down syndrome; prevalence of behavioral problems in siblings of children

with Down syndrome; attitudes of parents towards children with Down syndrome; and association of antenatal, natal or postnatal factors with Down syndrome.

### Subjects and Methods

The present study was conducted in the Pediatric Outpatient Department of All India Institute of Medical Sciences (AIIMS), New Delhi. Forty consecutive children with Down syndrome were included as the Study Group (SG). The Control Group (CG) consisted of forty age and sex matched children attending the immunization clinic in Pediatric OPD. After ensuring the confidentiality of the information, the informed consent was taken from the parent. The children were examined along with their parents (Mother/Father or both).

*Questionnaires/Scales used*

- (a) *Semi-structured questionnaire*: It was used to record the history (socio-demographic profile, antenatal, natal or postnatal history) and development.
- (b) *Behavior Screening Questionnaire (BSQ)* (14) was used to screen the study groups, their siblings and control group for behavioral problems. This questionnaire is a structured interview of the mother regarding child's behavior and includes 45 questions related to feeding, sleep, toilet training and social habits. Each item is scored on 5-point scale. For extreme behavior problems score of one, for occasional problems score of three and if no problem, score of five is given. Score 2 and 4 are given for behavior 1 to 3 and 3 to 5, respectively. The scale allows maximum score of 20 and if the score is three or more in item, it indicates normal behavior in that area. Individual scores of each item were added mathematically and total score of less than 12 or score of less than 3 on each item indicated a behavioral problem.
- (c) The assessment of parental attitudes was done on *Attitude Screening Questionnaire*, which included two separate questionnaire for mother and father. Maternal Attitude Screening Questionnaire (MASQ)(14) scale has 5 questions each related to maternal attitudes in relation to child's feeding, toilet, sleep and socialization habits. Seven questions were related to maternal feeling about child's nature, expectations, goals of child rearing, role as a parent, understanding of child's behavior, discipline and ways to influence them. The scoring is done as complete rejection (score 1), complete indulgence (score 5), balance adjustment (score 3). Score 2 is given between behaviors 1 and 3 and 4 for behavior between 3 and 5. This scale has been previ-

ously used in Indian population(15) and found reliable.

Paternal attitude in both study and control groups was assessed on a standardized questionnaire developed from the characteristics described by Chamberlin(16) to differentiate various types of child rearing approaches defined in terms of parent's new points *i.e.*, autocratic, corporative and overprotective. This was a structured interview having 7 questions followed by suggested answers. Fathers were told that none of the suggested answers were wrong so he may tell that answer which is most appropriate in his opinion. First six questions have 3 suggested answers. For first questions, score of 1, 2 or 3 were given respectively for a, b or c answers' while for seventh question, score of 1 was given for a or b choice 2 for c or d and 3 for e, f, g. This scale allowed a maximum score of 21.

- (d) *Developmental Quotient (DQ)* of children in study group was evaluated by a clinical psychologist (Mrs. Savita Sapra) using Gessel's developmental schedule, Seguin Form Board, Vineland social maturity scale, DASSI-II (Bayley's scale), Malin's Intelligence Scale (for Indian children) and Stanford-Binet test.

The children in Study Group also underwent other laboratory investigations (Thyroid function tests, EEG, BERA, CT Scan Head *etc.* whatever required) and systemic evaluation (Vision and hearing assessment).The behavioral problems were diagnosed and classified according to ICD-10 (by WHO).

**Results**

Majority of children were in the age group of 2-4 years (57.5%) followed by children between age group of 6 to 24 months (20.0%), 4-6 years(15.0%) and above 6 years (7.5%). There were 26 boys (65.0%) and 14 girls

(35%). Fifteen children (37.5%) with Down's syndrome had one sibling followed by those who were alone (25%), had two siblings (20%), 3 siblings (20.0%) or above 4 (7.5%). Two children had twins with Down's syndrome. Majority of children belonged to joint families (62.5%). About 50% mothers had education upto high school whereas 80% fathers had above high school education. Majority of mothers (90%) were housewives whereas fathers were employed (35%), business (22.5%) or other skilled work (25.0%). Higher number of children belonged to families with monthly income below Rupees 5000 (40%).

Only seven mothers (17.5%) were above 30 years at the time of delivery. Among the antenatal factors, intake of drugs (22.5%), toxemia of pregnancy (5%), multiple pregnancy (5%), family history of mental retardation (5%) were seen. In perinatal factors, delayed crying (92.5%), low birth weight (50.0%), preterm delivery (35.0%) were common. In postnatal period, Jaundice (12.5%), seizures (12.5%), birth asphyxia (12.5%), congenital heart disease-VSD (5.0%) were seen. Eighty five per cent children were brought to hospital due to delayed milestone followed by those with complaints of seizures (12.5%), delayed speech (7.5%), scholastic problems (7.5%), head nodding (2.5%).

**TABLE I**—Scores of children on Behavior Screening Questionnaire (BSQ).

Behavior	Study group Mean (SD)	Control group Mean (SD)
Feeding	2.04 (0.82)	4.16 (1.12)*
Toilet training	1.24 (1.36)	3.85 (0.17)*
Sleep	2.92 (0.72)	4.22 (0.64)*
Socialization	1.76 (0.86)	3.72 (0.40)*

\*Significant (P < 0.01).

Majority (82.5%) were hospital delivered and had a natural delivery (85%). Breast-feeding was given upto 6 months in 32.5%, upto one year in 25.0% and more than one year in 22.5% whereas 20% did not receive breast feeding at all.

Twenty cases (50%) had Developmental Quotient of 51-70 followed by 36-50 (32.5%), 30-35 (10.0%) and above 70 (7.5%).

The children with Down's syndrome showed behavioral problems related to all the spheres (feeding, socialization, toilet training and sleep) as compared to control group (Table I).

Mean scores on Maternal Attitude Screening Questionnaire (MASQ) were significantly different in all the spheres of rearing except sleep (Table II). Mothers showed highly indulgent attitude as related to feeding to nearly total neglect as related to socialization and toilet training whereas in Paternal Attitude Screening Questionnaire (PASQ), there was total neglect in all the spheres as compared to control group.

Twenty-two children (55%) with Down's syndrome showed behavioral problems as compared to 5 (12.5%) in control group. The behavioral problems more common in children with Down's syndrome as compared to control group were unsocialized disturbances of conduct (37.5%), sleep disturbances

**TABLE II**—Scores on Maternal Attitude Screening Questionnaire (MASQ).

Behavior	Study group Mean (SD)	Control group Mean (SD)
Feeding	4.52 (0.16)	3.64 (0.36)*
Toilet training	1.82 (1.02)	3.12 (0.62)*
Sleep	3.80 (0.64)	4.02 (0.18)
Socialization	1.92 (0.90)	3.92 (0.56)*

\*Significant (P < 0.01).

(15.0%), ADHD (12.5%), enuresis (12.5%), and seizures (12.5%). Among siblings of Study Group, the behavioral problems noted were unsocialized disturbance of conduct (15%), ADHD (10.0%), *etc.* (Table III).

### Discussion

Majority of children with Down's syndrome brought to hospital were of 2-4 years age group (57.5%) followed by children between 6 months to 2 years (20.0%). Boys outnumbered girls by 1.9:1 comparable to other studies reporting 1.7:1(17) and 2.1:1(4). The preponderance of boys could be due to factors that more attention and care is given to males as supported by male: female ratio of children attending pediatric OPD(2,4) or Down's syndrome is more common in boys(4). However, Gath and Gumley(2) found no differences with age and sex.

The chances of Down's syndrome are increased after the maternal age of 30 years at the time of delivery(2) but in the present study, only 17.5% mothers were above 30 years of

age. The majority were between the age group of 25-30 years (47.5%). In a study by Gath and Gumley(2) comparing Down's syndrome with other types of mental retardation, mean age of mothers were found to be 33.5 years and 28 years respectively.

There had been an association of psychiatric disturbances in children with type of family(4) being more common in nuclear families(18) but in the present study, majority of children belonged to joint families (65%). This was not significant when compared with control group, which had 60% children belonging to joint families. The significantly greater number of mentally retarded children with psychiatric symptoms in the lower social classes is consistent with other studies(2,17). This could be partly due to preponderance of lower social classes attending the Government hospitals(18). There was no association of Down's syndrome with maternal or paternal education or birth order of the child as reported in previous studies(2,17).

Fifty per cent of the children with Down's

**TABLE III**—Behavioral Problems Seen in the Study and Control Groups and Siblings of Study Group.

Behavioral Problem	Study group (SG) N = 40 (%)	Control group (CG) N = 40 (%)	Siblings of SG N = 60 (%)
Unsocialized disturbance of conduct	15(37.5)	2(5.0)	9(15.0)
ADHD	5(12.5)	1(2.5)	6(10.0)
Enuresis	5(12.5)	2(5.0)	5(8.3)
Encopresis	2(5.0)	—	—
Eating disorder (Pica)	4(10.0)	—	—
Sleep disorders	6(15.0)	3(7.5)	4(6.7)
Tics	2(5.0)	—	—
Others unspecified	4(10.0)	2(5.0)	6(10.0)
Epilepsy	5(12.5)	—	—
Self- mutilation	3(7.5)	—	—
Psychosis	2(5.0)	—	—
Disturbance of emotions specific to childhood	3(7.5)	1(2.5)	3(5.0)

### Key Messages

- There is higher prevalence of psychiatric disorders in children with Down's syndrome and their siblings.
- There is developmental delay in all spheres (motor, adaptive and social) in children with Down's syndrome.
- The parental attitudes are of overindulgence or neglect and need reconstruction through counselling and this will not only help in caring the children with Down's syndrome but also other siblings.

syndrome had DQ between 51 to 70. This has also been reported in various studies that the children with Down's syndrome showed low scores on motor, adaptive and social development at all ages as compared to normal children(19) and this is also seen in relation to feeding, socialization, toilet training and sleep.

The mothers showed an attitude of high indulgence related to feeding to nearly total neglect in relation to socialization and toilet training in comparison to fathers who showed an attitude of nearly total neglect in all the spheres as compared to control group. Other studies have reported that parents of children with mental retardation were relatively more controlling and less playful with their child(9) and in families with a retarded child, there was less frequent maternal behavior towards the retarded child. Also, it has been noted that there is less frequent communicative behavior of the retarded child towards the parents and more frequent spousal interchanges with regard to the child. But fathers of retarded children were documented to differ less from fathers of non-retarded children than did mothers(10,11), this has also been reported in the present study. There is no association of age, sex and level of retardation on child specific parental responses(20). With family intervention or training of parents, there is significant increase in the outcome scores and clinical improvement in the total parental attitude score, orientation towards child-rearing, knowledge towards

intellectual disability and attitude towards management(21,22). There is also improvement in marital adjustment(12,21).

The prevalence of behavioral problems in children with Down's syndrome was 55% as compared to 12.5% in control group. Previous studies have reported the prevalence of psychiatric disorders in mentally retarded children ranging from 13% to 75% (4,7,17, 19,21). Unsocialized disturbances of conduct, sleep disturbances, ADHD, seizures *etc.* are common disturbances observed in children with Down's syndrome and their siblings. This has also been reported in previous studies(1,3,5,6,19).

There is need to conduct more studies on the psychosocial aspects of children with Down's syndrome, especially from this sub-continent.

*Contributors:* MSB and MK designed the study, reviewed literature, analysed data and drafted the manuscript. SS performed developmental evaluation and helped in interpretation of results and drafting of paper. MSB shall act as guarantor.

*Funding:* None.

*Competing interests:* None.

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