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Temperamental traits of children with HIV: A comparative study

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Abstract: *Temperament is a very important aspect of functioning that needs to be understood in children with HIV. Temperament significantly influences the manner in which a child interacts with the environment over the long term. Temperamental traits may be an early sign of vulnerability to later development of psychological problems. The aim of this study was to analyze the temperamental traits associated with children with HIV. Three groups of thirty each of children with HIV staying with family, children with HIV staying at orphanage homes away from family attending outpatient services at paediatric ART centre and children without HIV staying at orphanage homes away from family attending paediatric outpatient clinic for minor ailments were matched for age, sex, education and social background. The Temperamental Measurement Schedule (TMS) was used for evaluating the temperamental dimensions. The characteristic temperamental traits associated with HIV children were low threshold of responsiveness and low rhythmicity.*
Keywords: *Temperament, HIV children, psychological problems*

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I. INTRODUCTION

The National AIDS Control Organization estimates around 21.17 lakhs people in India are living with HIV giving a national adult prevalence of 0.26% (0.22% -0.32%). Of these, an estimated 40.5% were females and 6.54% were children below 15 years. [1] Due to advances in treatment and survival, pediatric HIV is now viewed as chronic illness (Meyers & Weitzman, 1991). [2] Because children are now living longer with HIV, the next challenge is to optimize the health of these children. There is growing research and programme literature on the impact of the HIV/AIDS epidemic on children. These impacts occur in a number of overlapping and interdependent domains, including children's psychosocial development. As a result of death and migration, family members, including dependent children, often move in and out of households. Caregivers change and siblings may be split up. Separation from siblings has not only been found to be a predictor of emotional distress in children and adolescents, but children become more vulnerable when they are cared for by very aged relatives due to the conditions of mutual dependency that often exist between adult and child. The common impacts of HIV/AIDS include deepening poverty, such as pressure to drop out of school, food insecurity, reduced access to health services, deteriorating housing, worsening material conditions, and loss of access to land and other productive assets. Psychosocial distress is another impact on children and families, and it includes anxiety, loss of parental love and nurture, depression, grief, and separation of siblings among relatives to spread the economic burden of their care. [3]

Affected and orphaned children are often traumatised and suffer a variety of psychological reactions to parental illness and death. In addition, they endure exhaustion and stress from work and worry, as well as insecurity and stigmatisation as it is either assumed that they too are infected with HIV or that their family has been disgraced by the virus. Loss of home, dropping out of school, separation from siblings and friends, increased workload and social isolation may all impact negatively on current and future mental health. Existing studies of children's reactions suggest that they tend to show internalising rather than externalising symptoms in response to such impacts—depression, anxiety and withdrawal—as opposed to aggression and other forms of antisocial behaviour. [4, 5, 6] Apart from other impacts, children affected by HIV/AIDS are themselves often highly vulnerable to HIV infection. Their risk for infection arises from the early onset of sexual activity, commercial sex and sexual abuse, all of which may be precipitated by economic need, peer pressure, lack of supervision, exploitation and rape. [7] Children who grow up without the love and care of adults devoted to their wellbeing are at higher risk of developing psychological problems. [8] A lack of positive emotional care is associated with a subsequent lack of empathy with others and such children may develop antisocial behaviours. Not all children are, however, affected or affected to the same degree. Protective factors—in the form of compensating care from other people including teachers, as well as personality predisposition—may lessen the impact on children of reduced care in the home environment.

Temperament refers to individual characteristics that are assumed to have biological or genetic basis, that determine the individual's affective, attentional and motor responses cross- situationally and that play a role in subsequent social interaction and social functioning. These individual differences appear early during childhood and are stable to a certain extent. [9] Temperament is thought to be a relatively stable construct that helps to predict how children react to and manage their environments. Different temperamental traits in children shapes how they adapt to different psycho social situations.Thus, temperament is fundamental to the understanding of adaptive and maladaptive childhood functioning. [10] Even though there is a genetic basis for temperamental dispositions of an individual, these are modified by environmental factors. Alexander Thomas and Stella Chess who launched the New York Longitudinal Study in 1956 systematically explored these differences in children and their significance. They documented nine temperamental dimensions such as activity level, rhythmicity, approach or withdrawal, adaptability, threshold of responsiveness, intensity of reaction, quality of mood, distractibility, attention span and persistence. Modern concepts of temperament emphasize its emotional, motivational and adaptive skills. [11] Temperament is a predictive factor for child behaviour. It is an essential ingredient for self regulation and a part of future personality formation. Previous studies found relationship between difficult temperaments with future behavioural disturbances. [12, 13, 14, 15, 16] Researches done by DePauw and Mervielde and Bucky and Edwards showed the effectiveness of temperamental character on future personality and psychiatric state. [17, 18] Hashemian P Showed temperamental characters of high power and energy (high activity) have relation with conduct behaviour, impulsivity, hyperactivity and anxiety. Distractibility and irregularity are associated with hyperactivity. [19]

Studies have noted that characteristic temperamental traits may be associated with both physical and psychiatric disorders in children. [20, 21] Literature on temperamental characteristics of children with HIV is scant. Even though relationship between temperament and psychopathology is well documented, Indian studies that specifically analyze the relationship between temperament and HIV children are sparse. With this background, the present study was undertaken to analyze the temperamental characteristics of children with HIV.

II. Materials And Methodology

The present study was a comparative cross sectional exploratory study conducted at Pediatric ART Centre of a tertiary pediatric hospital. Before starting the study, permission was taken from concerned authorities and institutional ethical committee clearance for conducting study at Pediatric ART centre. A total sample of 90 with three groups of 30 each of HIV children staying with family members, HIV children staying at homes away from family and non HIV children staying at homes away from family was taken for the study with purposive sampling method. After taking written informed consent from parents / caretakers, children fulfilling inclusion criteria of age group of 8-14 years of both sexes with HIV diagnosis based on NACO guidelines were taken into the study. [22] Children with Mental retardation, Cerebral palsy, Epilepsy, history of any complicated head injury, acute illness at time of study and other major physical illness (congenital heart disease, congenital anomalies etc) were excluded. Details about socio demographic data, socioeconomic status of study groups by modified Kuppuswamy scale were collected with a semi structured intake proforma. Subsequently the caretakers were administered Malhotra Temperament Measurement Schedule to assess the temperamental dimensions of children. The data thus collected was subjected to statistical analysis using Chi-Square test and ANOVA by statistical software SPSS version 17. The significant findings obtained while comparing the three groups were discussed.

TOOLS: A written consent was obtained from all the caregivers of ninety children after explaining about the study. The following tools were applied to the caregivers of children.

I. **Semi structured Intake proforma:** This was specifically compiled for present study to record socio demographic details covering age, sex, social background, education status and socio economic status.

II. **Temperament Measurement Schedule (TMS):** [23, 24] This schedule, devised by Savita Malhotra in 1995, was used to measure the temperament of the children. This is a standardised scale for Indian children.TMS measures nine temperament variables: approach-withdrawal, adaptability, threshold of responsiveness, mood, persistence, activity, intensity and distractibility. It consists of 45 items (five items in each of nine variables) rated on a five point scale. Definitions were provided for the two extreme scores one and five with a mid point at three. The score less than three were in negative direction and those more than three were in positive direction. Mean scores for each of these variables were computed by dividing the total score by five.

The nine temperamental variables were reduced to five dimensions of factors. Factor one, sociability consists of three variables namely approach withdrawal, adaptability and threshold of responsiveness. Factor two, emotionality consists of two variables namely mood and persistence. Factor three, energy level is constituted by activity level and intensity of reaction. Factor four consists of one variable, distractibility. Factor five also made of one variable rhythmicity. The test-retest reliability of this schedule is 0.83 to 0.94 with satisfactory factorial and construct validity.

DATA ANALYSIS: The data was collected and subjected to statistical analysis using means and standard deviation for continuous variables and frequencies and percentages for discrete data. One way analysis of variance (ANOVA) was used to assess group differences (i.e., HIV children staying with family vs HIV children staying away family vs Non HIV children staying away family) for each of temperamental dimensions on Temperamental Measurement Schedule (TMS). Post hoc analysis by LSD (Least Square Difference) method was employed to compare the means of individual groups. Null hypothesis is rejected when $p < 0.05$.

III. Results

Socio demographic distribution across three groups is depicted in table I. All three groups were equally matched with relation to age distribution. Mean age of all three groups was 11 yrs. HIV with family group had 17 boys and 13 girls, HIV away family group had 16 boys and 14 girls and Non HIV away family group had 15 boys and 15 girls. All three groups were equally matched with respect to sex distribution. In HIV with family group, 53.3% belong to urban background and 46.7% belong to rural background, in HIV away family group 43.3% belong to urban background and 56.7% belong to rural background and in Non HIV away family group 50% belong to urban background and 50% belong to rural background. All three groups were comparable in relation to social background. Most of children were pursuing primary education, 73.3% in HIV with family group, 60% in HIV away family group and 70% in Non HIV away family group. Majority of the children in all three groups were school going. Two children (6.7%) in HIV with family group and one child (3.3%) in HIV away family group were not going to the school and staying at home because of severity of illness. 46.7% of children with HIV with family group belong to lower socio economic status, 30% belong to lower middle class, and 20% belong to upper lower class. 96.7% in both HIV away family group and in Non HIV away family group belong to lower socio economic status. This difference reached high statistical significance ($p<0.001$).

One-way ANOVA test was done to find any variance of mean scores of Temperamental Measurement Schedule among three groups namely HIV children staying with family, HIV children staying away family, Non HIV children away family which is depicted in table 2. HIV children staying with family (3.15) and HIV children staying away from family (3.15) have lower mean scores of approach withdrawal compared to Non HIV children staying away from family (3.22). This difference is not statistically significant. Non HIV children staying away from family had lower mean scores in variable of adaptability (3.20) compared to HIV children staying with family (3.21) and HIV children staying away from family (3.28) but the difference is not statistically significant.

Table 1: Socio Demographic Distribution Of Study Groups

VARIABLE	HIV WITH FA N (%)	HIV AWAY FAMILY N (%)	NON HIV AWAY FAMILY N (%)		p VALUE
	Mean (SD)	Mean (SD)	Mean (SD)	F VALUE	
AGE OF CHILD	11.03(2.04)	11.57(1.79)	11.30(2.00)	0.56	0.57
SEX	N (%)	N (%)	N (%)	CHI-SQUARE	
MALE	17(56.7%)	16(53.3%)	15(50%)		
FEMALE	13(43.3%)	14(46.7%)	15(50%)	0.268	0.88
SOCIAL BACKGROUND					
URBAN	16(53.3%)	13(43.3%)	15(50%)		
RURAL	14(46.7%)	17(56.7%)	15(50%)	0.623	0.73
EDUCATION OF CHILD					
PRIMARY	22(73.3%)	18(60%)	21(70%)		
SECONDARY	8(26.7%)	11(36.7%)	9(30%)	2.926	0.57
ILLITERATE	0(.0%)	1 (3.3%)	0(.0%)		
CURRENT OCCUPATION STATUS OF CHILD					
SCHOOL GOING	28(93.3%)	29(96.7%)	30(100%)		
STAYING AT HOME	2(6.7%)	1 (3.3%)	0(.0%)	2.069	0.36
SOCIOECONOMIC STATUS					
UPPER MIDDLE	1 (3.3%)	0(.0%)	0(.0%)		
LOWER MIDDLE	9(30%)	0(.0%)	0(.0%)		
UPPER LOWER	6(20%)	1 (3.3%)	1 (3.3%)	32.50	<0.001
LOWER	14(46.7%)	29(96.7%)	29(96.7%)		

Fig 1: Mean Plot Depicting Threshold Responsiveness Scores Across Three Groups

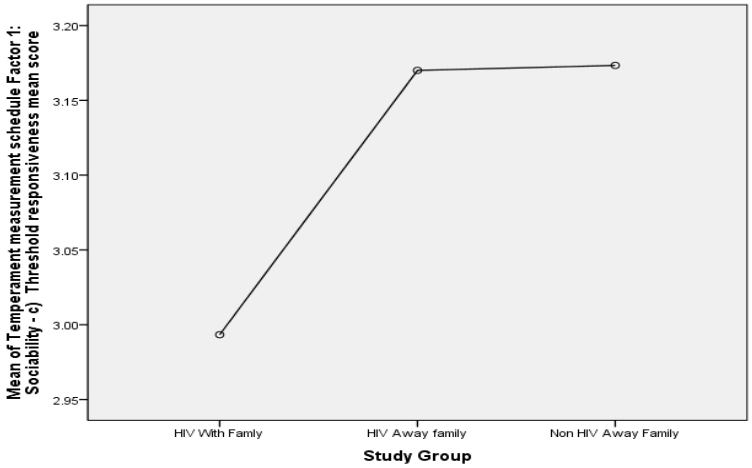
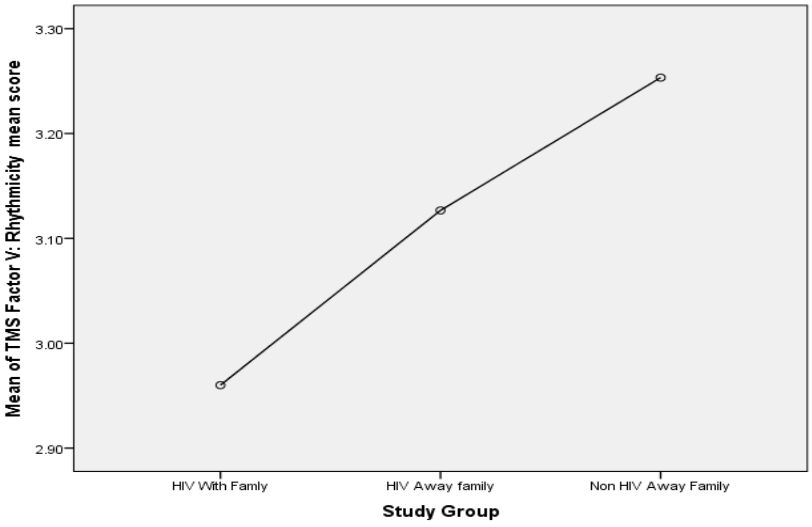


TABLE 2: Temperament Measurement Schedule (Tms) Scores Across Three Groups

VARIABLE	HIV WITH FAMILY MEAN (S.D.)	HIV AWAY FAMILY MEAN (S.D.)	NON HIV AWAY FAMILY MEAN (S.D.)	ANOVA F VALUE	p VALUE
TMS Ia- APPROACH WITHDRAWAL	3.15(0.44)	3.15(0.38)	3.22(0.24)	0.41	0.66
TMS Ib- ADAPTABILITY	3.21(0.43)	3.28(0.32)	3.20(0.22)	0.54	0.59
TMS Ic- THRESHOLD RESPONSIVENESS	2.99(0.35)	3.17(0.29)	3.17(0.24)	3.56	0.03
TMS I - SOCIABILITY	3.11(0.36)	3.20(0.26)	3.19(0.16)	1.02	0.37
TMS IIa - MOOD	3.18(0.49)	3.21(0.43)	3.11(0.20)	0.44	0.64
TMS IIb- PERSISTENCE	3.13(0.35)	3.24(0.37)	3.17(0.22)	0.86	0.43
TMS II- EMOTIONALITY	3.16(0.38)	3.22(0.34)	3.14(0.16)	0.59	0.56
TMS IIIa- ACTIVITY	3.16(0.39)	3.25(0.36)	3.24(0.26)	0.60	0.55
TMS IIIb- INTENSITY	3.16(0.38)	3.25(0.31)	3.23(0.24)	0.65	0.52
TMS III-ENERGY	3.16(0.37)	3.25(0.29)	3.24(0.21)	0.72	0.49
TMS IV-DISTRACTABILITY	3.16(0.34)	3.13(0.30)	3.27(0.15)	2.09	1.29
TMS V-RHYTHMICITY	2.96(0.39)	3.13(0.28)	3.25(0.23)	6.80	0.00

Fig 2: Mean Plot Depicting Rhythmicity Scores Across Three Groups



When compared the mean scores of threshold responsiveness across three groups, we found the difference to be statistically significant with p value of 0.03 which is depicted in fig 1. Mean scores of threshold responsiveness were lower in HIV children staying with family (2.99) compared to HIV away from family (3.17)

and Non HIV away from family (3.17). This indicates HIV children staying with family needed lower intensity of stimulation to evoke discernible response like sensitivity to noise, heat, cold, things he saw and tasted, texture of clothing. Even though sub variable scores of factor sociability differ among three groups, there was no statistically significant difference between mean scores of sociability among three groups. Subjects in Non HIV away family group had lower mean scores of variable mood than the subjects in HIV with family and HIV away family groups but the difference is not statistically significant. We could not find any statistically significant difference when compared the mean scores of variable persistence across three groups. Overall, all three groups had similar mean scores of factor emotionality without statistically significant difference.

When compared the mean scores of temperamental variables of activity and intensity and factor energy across three groups, there was no significant difference. We could not find any statistically significant difference when compared the mean scores of factor distractibility across three groups. Subjects in HIV with family group had lower mean scores of factor rhythmicity (2.96) than subjects in HIV away family group (3.13) and Non HIV away family group (3.25). This difference had reached strong statistical significance with p value of 0.001. It indicates that HIV children staying with family group were irregular in daily functions like sleep-wake cycle, hunger, feeding pattern, elimination schedule. The statistical analysis showed that no association could be made out between socio demographic variables and temperamental traits of HIV children.

IV. Discussion

The present study tried to evaluate the temperamental traits in children with HIV. All three groups namely HIV children staying with family members, HIV children staying away from family at homes and Non HIV children staying away from family at homes were equally matched with respect to age, sex distribution, social background and educational status. When compared socioeconomic status across three groups, we found the difference reaching high statistical significance ($p<0.001$). The higher representation of lower class in HIV away family and Non HIV away family groups is due to the fact that the study sample is taken from orphanage homes as the socio-economic deprivation is most common reason for home placement. In our study we found lower threshold responsiveness and lower rhythmicity in HIV children compared to Non HIV children with statistical significance. When compared to HIV children staying away from family at homes, HIV children staying with family had lower mean scores in threshold responsiveness and rhythmicity variables. Even though without statistical significance, HIV children staying with family had lower scores of sociability compared to HIV children and Non HIV children staying away from family. Lower threshold responsiveness and lower sociability leads to deficits in interpersonal functioning which may predispose to future internalizing behavioural problems. Lack of rhythmicity is of particular importance, as the caregiver and child are in mutually well tuned well adjusted rhythm in the normal course. Any out of rhythm behaviour or gesture or expression can upset the caregiver-child/ parent-child unit.

The higher representation of difficult temperamental traits in HIV children staying with family members compared to HIV children staying away from family at homes can be explained by inconsistent parenting. Staying with parents suffering from illness has long been considered as a risk factor for psychological problems. [8] Because of multiple losses of family members dying of AIDS, financial problems, stigmatization towards HIV infected individuals and burden of caring for HIV infected children, primary caregivers cannot provide consistent parenting. A difficult temperament acts as vulnerability for behavioural problems, while an easy temperament functions as a protective factor. On studying the interaction of family functioning, temperament and behavioural problems, Tschann et al (1996) [25] found that children with more difficult temperaments in high-conflict families had the most internalizing and externalizing behaviour problems, while children with easy temperaments had fewer such problems regardless of levels of family conflict.

The "goodness of fit" model developed by Thomas and Chess predicts that the concordance or the agreement in the temperament as reflected by the characteristic ways of responding to the environment between the child and the caregiver would result in a tendency for positive relations and outcomes. The nature of the environmental demands or expectancies (such as the teaching and parenting styles, and the organization of the learning environment) and children's capacities (such as temperament) may influence activity, sociability, rhythmicity and attentiveness levels. This illustrates how the inappropriate parenting styles in families of HIV probably can have adverse effects on temperamental characteristics of children living in such families. Previous studies have shown the relation between temperamental traits and future behavioural problems. [12, 13, 14, 15, 16] By targeting temperamental traits as part of comprehensive treatment plan, we can prevent future physical and psychiatric disorders in children with HIV. In our country there is a paucity of studies on mother-baby interactions, normal and abnormal, as Child and Adolescent Psychiatry as a discipline is still yet to develop; our study may be fitting in as a small attempt to fill such lacunae particularly for pediatric HIV.

V. Conclusion

Parents and teachers should be aware of the influence of temperament on the behaviours exhibited by children. This will help to understand children and their behaviour in a better way. While planning strategies to help children with HIV cope with life stresses, the temperamental characteristics need to be taken in to consideration. Temperamental characteristics also influence the management of children with psychological and emotional disorders.

LIMITATIONS: Interpretation of findings in the study is limited by small sample size, hospital based cross sectional study and there was no pilot study. In this study there was exclusive reliance on care givers as a source of data. Data from other sources such as teachers and bigger sample size might have improved the validity of these findings. This study was performed in one centre so multi centre study could have been better. There was no blinding in this study. These limitations should be considered while interpreting the results.

FUTURE DIRECTIONS: The present study can be used as a preliminary study for future prospective cohort study. Results obtained in current study are of limited clinical significance due to cross sectional design of study. By changing the study design to longitudinal follow up study with serial assessments of subjects and taking consideration of other variables like psychological adjustment, health locus of control, coping style, emotional problems, behavioural problems , the results will be of more meaningful and can be evaluated for consistency.

KEY MESSAGE: Characteristic temperamental traits of low threshold of responsiveness and low rhythmicity were associated with children with HIV. Temperamental characteristics also should be considered while planning strategies to help children with HIV along with other factors.

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