



**ORIGINAL RESEARCH PAPER**

**Paediatrics**

**COMPARISON OF THE PATTERNS OF SLEEP DISORDERS IN AUTISTIC CHILDREN AND THEIR SIBLINGS AS A EARLY PREDICTOR OF AUTISM**

**KEY WORDS:** autism, neuro plasticity, sleep disorders, parasomnias

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**ABSTRACT**

**BACKGROUND:-** Autism spectrum disorder (ASD) is an early onset neuro- developmental disorder characterized by persistent difficulties in social interaction and communication with repetitive behavioral problems symptoms appears within 2years of life. Children with ASD frequently suffer from co-morbid psychopathologies out of which sleep disorders are most commonly occurring in up to 50 to 80% of the cases leading to synaptic plasticity and pruning during brain development. **AIM & OBJECTIVES:-** So our aim is to correlate the sleep profiles between the autistic children and their siblings who are very likely to develop autism in near future. So, early screening and treatment for sleep problems in high risk siblings can prevent the insult to growing brain. **METHODOLOGY:-** This was a case-control study which was conducted between 01/10/2020 & 30/06/2022 .Total 84 cases (autistic child and their sibling)and 46 control(only sleep disorder) were taken who presented to the Neurology OPD at Hi-tech medical college, Bhubaneswar by assessing the sleep/wake diaries ,school sleep habit survey and social responsive scale-2 (SRS-2) and child behaviour check list (CBCL). **RESULT:-** Sleep problems in early childhood were associated with higher SRS-2 score which was related to severity of autistic symptoms in 89% cases. Autistic child and their high risk siblings showed no significant difference regarding their sleep profiles except that autistic children had more insomnia in 26% cases and their siblings showed more wake latency and parasomnias 33% cases.95% of the siblings of autistic child developed autism subsequently in the later life. **CONCLUSION:-** The impairment of circadian sleep regulation increases vulnerability to develop symptoms of ASD, which needs to be addressed in early stage of life to have a better social and adaptive adjustment.

**INTRODUCTION:-**

- According to DSM-5, autism spectrum disorder (ASD) are complex , multi factorial early onset neuro developmental disorder characterized by persistent difficulties in social interaction ,communication & presence of stereotypic behaviors ,symptoms appears within 2years of life.
- The incidence of autism in India 2022 is-88.50 per10,000 population. (by world population review)
- The increased incidence of ASD in recent times is due to:-
  1. Covid related restriction of movements
  2. Increased screen time
- 3.Perinatal risk factors like-increased parental age at the time of conception , cigarette & alcohol addiction, maternal comorbidities like-preeclampsia, diabetes.
- Children with ASD frequently suffer from co-morbid psycho pathologies out of which sleep disorders occurs in up to 50-80% of cases.
- Poor sleep in early childhood (impaired myelination and oligodendrocyte precursor cell proliferation) is related with alteration in brain development leading to cognitive, attention, emotional and behavioral problems.

**AIM & OBJECTIVE:-**

The aim of our study is to correlate the occurrence of sleep problems in autistic child and their siblings to determine if sleep problems were associated with symptoms of autism in siblings of autistic children..

**METHODOLOGY:-**

- This study was a case control study which was conducted at Hi-Tech medical college and hospital, Bhubaneswar from 01-October 2020 to 30 June 2022 .
- A total of 142 cases were enrolled out of which :-42 were

autistic child (Group-A) ,42 were siblings of autistic child without autism symptomatology (Group-B) who presented to our Neurology OPD &control group- 58 (Group-C) those presented to Pediatrics OPD were taken.

- Sleep patterns were assed by:-
  - 1.Sleep /wake dairies.
  - 2.School sleep habit survey.
  - 3.Social responsive score-2 (SRS-2).

Siblings who showed any sleep disturbances or a SRS-2 score >60 were further investigated with:-

- 1.M-CHAT &
- 2.ISSA scoring for autism.

**INCLUSION CRITERIA:-**

1. Autistic children from age 1.5 to 6yrs
2. Siblings of autistic children without manifestation of symptoms of autism and no prior diagnosis of autism.
3. Control group with no family history of autism.
4. Parents given consent.

**EXCLUSION CRITERIA:-**

1. Single child.
2. Siblings of autistic children with mental retardation, epilepsy or any other neurological disease.
3. Siblings who received prior medications that might interfere with psychiatric assessment.
4. Siblings with positive family history of psychiatric disorder
5. Parents not given consent.

The data was analyzed by SPSS 2.0 software.

**OBSERVATIONS:-**

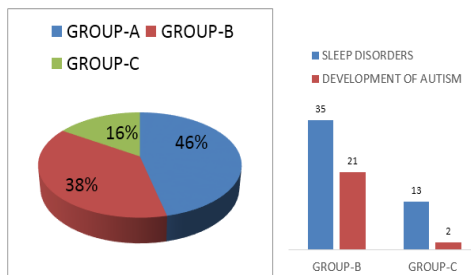
**[TABLE-1-SHOWING DISTRIBUTION OF SLEEP PATTERN AMONG THE GROUPS]**

GROUP CHARACTERISTICS	GROUP -A (AUTISTIC CHILD) n= 42		GROUP -B (SIBLINGS OF AUTISTIC CHILD) n=42		GROUP -C ( CONTROL) n= 56	
	MALE n=36	FEMALE n =6	MALE n = 32	FEMALE n= 10	MALE N = 38	FEMALE N= 18
SUBJECTIVE SLEEP DURATION AT NIGHT	RANGE= 8-10 HRS MEDIAN= 8.5HRS	RANGE= 8-10HRS MEDIAN= 8.8	RANGE=9-11HRS MEDIAN= 9.5 HRS	RANGE=9-11HRS MEDIAN= 9.3HRS	RANGE= 10-13 HRS MEDIAN= 11.1 HRS	RANGE= 11-13 HRS MEDIAN= 10.1 HRS
SLEEP LATENCY	RANGE= 0-80MIN MEDIAN= 15MIN	RANGE= 0-80MIN MEDIAN= 15MIN	RANGE= 0-80MIN MEDIAN= 39MIN	RANGE= 0-80MIN MEDIAN= 35MIN	RANGE= 0-30MIN MEDIAN= 18MIN	RANGE= 0-30MIN MEDIAN= 18MIN
WAKE AFTER SLEEP ONSET	RANGE= 0-90 MIN MEDIAN= 28 MIN	RANGE= 0-90 MIN MEDIAN= 27.5MIN	RANGE=0-120MIN MEDIAN= 10 MIN	RANGE=0-120MIN MEDIAN= 10MIN	RANGE= 0-120 MIN MEDIAN= 12MIN	RANGE= 0-120 MIN MEDIAN= 12MIN
WAKE LATENCY	RANGE= 0-30 MIN MEDIAN= 2MIN	RANGE= 0-30 MIN MEDIAN= 20MIN	RANGE=0-30 MIN MEDIAN= 44MIN	RANGE=0-30 MIN MEDIAN= 40MIN	RANGE= 0-60 MIN MEDIAN= 15MIN	RANGE= 0-60 MIN MEDIAN= 12MIN
NO OF PARASOMNIAS/ WEEK	RANGE= 1-4 MEDIAN= 2	RANGE=1-3 MEDIAN= 1.5	RANGE=3-6 MEDIAN= 4	RANGE=3-5 MEDIAN= 4	RANGE= 0-1	RANGE= 0-1

**TABLE-2- SHOWING ASSOCIATION OF SRS-2 SCORE AMONG THE GROUPS**

SRS-2 SCORE	GROUP-A N=42	GROUP-B N=42	GROUP-C N=58	INCIDENCE OF SLEEP DISTURBANCES
<60	0	2/7 (28.57%)	1/37 (2.70%)	3/44 (6.81%)
60 TO 65	6/10 (60%)	7/14 (50%)	2/15 (13.33%)	15/39 (38.46%)
66 TO 75	17/27 (62.9%)	10/18 (55.55%)	1/4 (25%)	28/49 (57.14%)
>76	4/5 (80%)	2/3 (66.66%)	1/2 (50%)	7/10 (70%)
TOTAL	27/42 (64.28%)	19/35 (54.28%)	5/21 (23.80%)	50/98 (51.02%)
rVALUE	Between Group-A & B- 0.97	Between Group B & C-0.91	Between Group-A&C-0.80	

**TABLE-3 -SHOWING ASSOCIATION OF SLEEP DISORDERS WITH SCREEN TIME**



**PICHAART SHOWING-Prevalence of sleep disorders Among the groups**

**BAR DIAGRAM SHOWING-prevalence of autism with sleep disorder**

**TABLE-4 -showing all the characteristic parameters among the group**

SUMMARY	GROUP-A	GROUP-B	GROUP-C
PRESENCE OF SLEEP DISORDER	38/42(90.47 %)	31/42(73.80 %)	13/58(22.41 %)
PRESENCE OF INCREASED SCREEN TIME	19/36(52.77 %)	16/33(48.48 %)	5/36(13.8 %)
PRESENCE OF HIGH SRS-2 SCORE	27/42 (64.28%)	19/35 (54.28%)	5/21 (23.80%)
DEVELOPMENT OF AUTISM	38(100%)	21/31(67.74 %)	2/13(15.38 %)

**DISCUSSION:-**

- In the present study sleep disorder in autistic child is 90.47% which is significantly higher than the control group.
- Our idea of screening autistic siblings for sleep pattern showed that 73.80% have sleep problems & 54.28% have high SRS-2 score.
- 48.48% the high risk siblings with sleep disorder associated with increased screen time.
- 67.74% of high risk siblings developed autism in their latter life.
- Autistic children showed more of insomnias & the wake after sleep onsets whereas in the siblings there is increased sleep latency and number of parasomnias.

**CONCLUSION:-**

- Recognition of abnormal sleep patterns in the siblings of autistic children may warrant a early screening test to detect ASD.
- In our study we concluded that the pattern of sleep in both autistic children and their siblings who went on to develop ASD in latter life is comparable.
- Prolonged use of screen time may be a cause of early sleep disturbances which may be a earliest marker of screening.
- Similar observations were observed by different authors .All used scales in this study were completed by parents ,which may have been a source of recall bias.
- However our study has small sample size and further prospective study may be required to validate our observations.

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