The Reach of Television and In-Person Behavioural Services for Children with Autism Spectrum Disorder (ASD): An Comparitive Assessment

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ABSTRACT:

Aim: To evaluate children with autism spectrum disorder (ASD) to typically developing controls and children with delayed language development (DLD), in order to determine the pattern and degree of television viewing in ASD children.

Methodology: A total of 84 controls (mean age 2.43 ± 0.81 years) and 54 ASD patients (mean age 2.56 ± 0.66 years) were enrolled. In our earlier study, 56 people with DLD who had language developmental levels comparable to those with ASD were included. The primary outcome indicators encompassed the frequency and beginning of television viewing, together with the programme genre and the presence of carer co-watching.

Findings: Individuals with ASD started watching TV considerably earlier than controls (6.44 ± 6.35 vs. 12.41 ± 6.00 months of age, p \$ 0.0001*) and watched TV for longer (4.60 vs. ± 1.91 vs. 3.05 ± 1.90 h∕day, p £ 0.0001*) and controls (4.60 ± 1.91 vs. 2.06 ± 1.21 h∕day, p £ 0.0001*). Those with ASD appeared to watch more adult program than normal controls, and they were less likely to watch television with caregivers than both control groups.

Conclusion: There is an earlier onset and higher frequency of television viewing in autistic children compared with children with typical development.

Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental condition often distinguished by social communication deficits and repetitive sensory motor behaviours usually appearing early in life. ASD can also be characterized by maladaptive cognitive functioning and particular behaviours that impair communication and learning, thus affecting social interaction.[1,2,3] ASD is typically present before the age of 3 years and is commonly accompanied by abnormalities in cognitive functioning, sensory processing, attention, and learning.[4] ASD is considered a spectrum because the various cognitive, social, and behavioural manifestations differ greatly amongst individuals, and the degree of impairment may range from mild to severe.[4] Though the etiology of ASD is still obscure, the consensus is that the development of atypical neurological functioning is multifactorial, involving the complex interaction of genetic and environmental components.[5]

ASD is quite common. It is estimated that 1/100 children are diagnosed with autism around the world.[6] In addition, ASD is up to four times more common in boys than girls and can affect people of all races, ethnicities, and socioeconomic backgrounds. Diagnosing ASD can be

complex, as there is no specific test for this condition. With the use of the DSM-V, experienced healthcare professionals, such as pediatricians and psychiatrists, can make a clinical diagnosis based on behavioural observation.[7]

Methodology

At the Meenakshi Medical College, Hospital and Research Institute in Kanchipuram, the Department of Paediatrics saw 54 children with ASD, whose mean age was 2.56 years (SD 0.66, age range 1.5–3.83 years), and 56 children with DLD, whose mean age was 2.11 years (SD 0.47, age range 1.33–3.67 years). As normal controls, 84 typically growing kids who visited the department over the same time period were enrolled. Their mean age was 2.43 years (SD 0.81, age range: 1.5–4 years). In our earlier investigation, participants with DLD and normal controls were enrolled (9). Age and gender matching to individuals with ASD was used to enlist generally growing controls. A growth-oriented and behavioural paediatric team consensus discussion including all of the authors, as well as a psychologist, developmental and behavioural paediatric fellows, a speech and language pathologist, a physical therapist, and a behavioural specialist, verified a diagnosis of ASD. This was based on the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revised criteria (15). The multidisciplinary team previously indicated made the diagnosis of DLD after conducting a medical assessment. The DLD group did not include individuals with recognised causes of developmental delay (DLD), such as ASD, genetic syndromes, hearing loss, neurological diseases, and global developmental delay (9). The Meenakshi Medical College, Hospital and Research Institute, Kanchipuram, Department of Paediatrics' Institutional Review Board gave its approval to the research project. Following the acquisition of informed consent, every participant underwent a comprehensive medical history, physical examination, and developmental evaluation conducted by one of the authors (WC or CP), who are both developmental and behavioural paediatricians with specialisation in ASD. Prenatal, perinatal, and postnatal history, developmental milestones, developmental delay or regression, behavioural issues, system reviews, and prescription drugs were all extensively reviewed in the medical history. The characteristics of people with ASD, DLD, and controls are listed in Table 1. Parental age, income,

education, status as the child's major carer, the number of family members, and family support—the participation of other family members in the child's care—were all considered socioeconomic factors. The parental and family traits of people with ASD, DLD, and controls are listed in Table 2. The primary focus of the study was on the subjects' early (onset), average amount of television watched (frequency), favoured shows (content), and method of watching television (con-- text) to document whether they were allowed to watch tele- vision alone or whether caregivers cowatched with them.

An in-depth interview was also used to thoroughly assess the average amount of time carers spent with their children each day engaging in interactive activities, such as helping them with toileting, brushing their teeth, bathing, getting dressed, listening to them about their daily activities, eating with them, teaching and encouraging them to talk, playing with them, etc., and the average amount of time carers spoke with their children during the day, such as telling stories and reading to them. Table 3 showed how people with ASD and typically developing controls compared to those with DLD in terms of their television-watching habits and time characteristics, such as the amount of time spent on interactive activities and the amount of time carers spent talking with their kids during the day. Evaluations of joint attention and sociability, play observations, expressive and receptive language, hearing screening, and hyperactive, repetitive, restricted, and stereotyped behaviours were all part of the developmental assessment process. Additionally, Denver-II, a validated developmental screening tool, was used to do developmental screening. The age at which participants could pass those items at the 75th percentile on the language develop-mental domain in the Denver-II was used to establish the language develop-mental level.[12]

Statistical analysis

ANOVA or the nonparametric Mann-Whitney U-test were used to compare continuous variables between subjects with ASD and the typically developing control group, as well as between those with ASD and those with DLD. These comparisons were based on the assumption of normality and equality of variance in each group. Fisher's exact test was used to compare categorical variables. If background variables differed significantly across the groups and could be related to the primary

outcome measures, analysis of covariance (ANCOVA) was performed using those variables as covariates. The statistical analyses were conducted using IBM, Inc.'s SPSS version 23.0. The significance level was set at 0.05 and all reported p-values were two-sided.

Results

Characteristics of study subjects

Among those with ASD and usually developing controls, there were not significant variations in background factors such as chronological age, gender, birth order, preterm birth, birth weight, and past medical illness (Table 1). Additionally, there were no appreciable variations in familial and parental traits between the two subject groups (Table 2). On the other hand, mothers of people with ASD were marginally older than parents of controls. As predicted, the Denver-II and developmental history both showed linguistic developmental delays in persons with ASD. The language developmental age of those with DLD did not differ significantly from those with ASD, despite the fact that they were considerably younger than those with ASD. In addition, an average of father's income in those with DLD was significantly lower than those with ASD, but the comparison of combined parental income between these two groups did not reach a significant level.
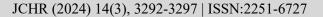
Comparison of television viewing habits between those with ASD and typically developing controls

Television watching started for people with ASD before their receptive and expressive language skills developed. It's interesting to note that televisual viewing began in people with ASD about six months sooner than in normally developing controls. When the majority of the controls started using meaningful words, they started watching television. In contrast to controls, a higher percentage of people with ASD started watching television before the age of 12 months. Nonetheless, both groups started watching television sooner than the AAP suggested before the children turned 24 months old. When it came to how frequently they watched television, people with ASD seemed to watch far more than controls or the AAP guidelines. Those with ASD were more likely to watch adult programmes including advertise- ments, TV series, news, games, entertainment shows and music videos than controls. Furthermore, individuals with ASD were more likely to be allowed.

Table 1 Characteristics of individuals with ASD compared with typically developing controls and those with DLD

Variables	ASD[a] (N = 54)	Control[b] (N = 84)	DLD[c] (N = 56)	p (a vs. b)	p (a vs. c)
Age (years)[†]	2.56 ± 0.66	2.43 ± 0.81	2.11 ± 0.47	0.093	<0.0001*
Language developmental age (years)[†]	1.29 ± 0.61	2.79 ± 1.00	1.39 ± 0.47	<0.0001*	0.193
Difference between language developmental level and CA[‡] (years)[†]	1.22 ± 0.74	0.36 ± 0.36	0.72 ± 0.37	<0.0001*	<0.0001*
Age at which the child can say the first meaningful word (months)[†]	21.43 ± 7.26	11.92 ± 1.92	17.38 ± 4.37	<0.0001*	0.008*
Male gender	42 (77.8%)	55 (65.5%)	46 (82.1%)	0.123	0.567
The first child	29 (53.7%)	43 (51.2%)	33 (58.9%)	0.773	0.581
Preterm (GA[§] < 37 weeks)	7 (13.0%)	8 (7.3%)	4 (7.1%)	0.257	0.309
Birth weight (g)[†]	3032.41 ± 551.06	2969.76 ± 592.62	3115.36 ± 505.51	0.535	0.412

Past medical illness	20 (37.0%)	39 (46.4%)	23 (41.1%)	0.276	0.665

*p < 0.05

†Data are represented as mean ± SD.

‡Chronological age.

§Gestational age.

ASD = autism spectrum disorder; DLD = delayed language development.

Table 2 Parental and family characteristics of individuals with ASD compared with typically developing controls and those with DLD

Variables (a vs. c)	ASD[a] (N = 54)	Control[b] (N = 84)	DLD[c] (N = 56)	p (a vs. b)	p
Father's age (years)†	36.48 ± 6.98	35.49 ± 7.11	36.57 ± 5.76	0.190	0.967
Father's income (baht/month)†	44 629.63 ± 73667.48	24 047.59 ± 19754.32	24 874.55 ± 30 908.10	0.083	0.035*
Father's education (higher than high school)	38 (70.4%)	49 (58.3%)	36 (64.3%)	0.153	0.497
Mother's age (years)†	34.26 ± 5.91	32.13 ± 5.86	32.66 ± 4.43	0.04*	0.110
Mother's income (baht/month)†	18 370.37 ± 67543.01	13 358.43 ± 14 203.19	15 052.73 ± 16 802.89	0.175	0.058
Mother's education (higher than high school)	39 (72.2%)	52 (61.9%)	41 (73.2%)	0.212	0.907
Primary caregiver (mother)	29 (53.7%)	49 (58.3%)	20 (35.7%)	0.592	0.058
Combined parental income (baht/month)†	31 500 ± 67 821.73	18 703 ± 14 964.97	19 964 ± 20 979.47	0.120	0.194
Number of family members (>4 persons)	43 (79.6%)	61 (72.6%)	45 (80.4%)	0.351	0.924
Family support	35 (64.8%)	52 (61.9%)	41 (73.2%)	0.730	0.341

*p < 0.05

†Data are represented as mean ± SD.

ASD = autism spectrum disorder; DLD = delayed language development.

Table 3 Television viewing habits and time characteristics of individuals with ASD compared with typically developing controls and those with DLD

Variables	ASD[a] (N = 54)	Control[b] (N = 84)	DLD[c] (N = 56)	p (a vs. b)	p (a vs. c)
Onset of TV viewing (months)[†]	6.44 ± 6.35	12.41 ± 6.00	7.22 ± 5.52	<0.0001*	0.212
Onset of TV viewing <12 months	43 (79.6%)	34 (40.5%)	39 (69.6%)	<0.0001*	0.229
Onset of TV viewing <24 months	53 (98.1%)	78 (92.9%)	56 (100%)	0.246	0.491
TV viewing/day (h)[†]	4.60 ± 1.91	2.06 ± 1.21	3.05 ± 1.90	<0.0001*	<0.0001*
TV viewing ‡2 h/day	51 (94.4%)	47 (56%)	39 (69.6%)	<0.0001*	0.001*
Viewing adult TV programme	38 (70.4%)	35 (41.7%)	34 (60.7%)	0.001*	0.287
No interaction during TV viewing	43 (79.6%)	11 (13.1%)	32 (57.1%)	<0.0001*	0.011*
Interactive time spending with the child/ day (h)[†]	5.01 ± 2.37	9.06 ± 2.21	7.03 ± 3.01	<0.0001*	<0.0001*
Spending time talking with the child/day (h)[†]	2.09 ± 1.72	5.79 ± 2.24	3.62 ± 2.19	<0.0001*	<0.0001*

*p < 0.05

[†]Data are represented as mean ± SD.

ASD = autism spectrum disorder; DLD = delayed language development.

Discussion

While a study by Shane and Albert and May et al.[8,9] found that people with ASD watched television more frequently than those in the current study, none of those previous research examined television use in younger people with ASD or discussed when people with ASD started watching television. ASD patients may also exhibit restricted and repetitive activities, attention issues, inappropriate regulation to arousal cues, and a combination of social and linguistic difficulties. Additionally, carers might not be able to effectively engage their children, which could lead to children with ASD diverting their attention to unsocial behaviours like watching television. For young children with autism, an adult moderator and enhanced parent-child interaction can be extremely important for brain development.[10] The second part of the first year was when behavioural symptoms of ASD were most likely to appear, starting to show a gradual deterioration in social communication habits and a loss of skills in individuals who were eventually diagnosed with the disorder.[11] As a result, ASD symptoms may start to show up in our study's ASD participants from around six months of age, when social and communication difficulties started to cause issues. This may explain why ASD participants seemed to start watching television earlier than their friends who were typically developing. When television use begins at about six months of age, it may serve as a subliminal indicator of social and/or language impairments in children who may be at risk for autism spectrum disorders. Additionally, the media's possible harmful effects—discussed in the Introduction section—which can co-occur in those with ASD should be taken into consideration. Increased attention to the screen, imitation of words and developing procedural knowledge about television's devices were observed in those with ASD[1], but how this knowledge can be pragmatically generalized in a way of social communication in the daily lives of those with ASD needs to be elucidated.

Small sample numbers, the absence of standardised ASD tests, and the use of an interview as the only objective measure of television watching habits in place of another, more objective one (such as behavioural observation in the home) were among our study's serious flaws. Nonetheless, we made an effort to make up for this shortcoming by conducting interviews in accordance with the methodology, no matter the topic's groups. It is necessary to conduct population-based studies on people with ASD and usually developing controls, including long-term follow-up. In addition, more research is needed to determine the immediate and long-term effects of media use in people with ASD or other neurodevelopmental disorders. This will help parents of ASD children make more informed decisions about their child's media use, especially when it comes to maximising its positive effects and minimising its risks. Future research should also look at the positive effects of watching television, such as mimicry and prosocial behaviour, as a means of creating interactive educational interventions through media that will eventually alter or shape unusual neural networks in the developing brains of individuals with ASD. These interventions should be more developmentally appropriate for those with ASD.[12]

Conclusion

There is an earlier onset and higher frequency of television viewing inautistic children compared with children with typical development.

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