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Case Report

Autism Spectrum Disorder in a Rural Pakistani Child with a History of Early Excessive Screen Exposure: A Case Report

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ABSTRACT

Deficits in communication, social interaction, and behavior mark autism spectrum disorder (ASD). In low-resource settings, diagnostic delays and excessive early screening exposure complicate clinical profiles and access to therapy. We present a 7-year-old female from a rural community in Pakistan who presents with profound regression in speech, social interaction, and adaptive behavior. A child psychiatrist used DSM-5 criteria to diagnose ASD, which should be regarded as a working clinical impression. The child had no prior family history of neurodevelopmental disorders. Still, beginning in infancy, the patient had a history of extended unsupervised mobile screen exposure (3–5 hours/day of animated content). Symptoms included echolalia, idiosyncratic language, violence toward animals and peers without remorse, toileting difficulties, and emotional detachment. Carers reported fewer violent outbursts (from daily to 1-2/week) and better sleep (from 3-4 to 6-7 hours/night). Over the course of six months, risperidone (up to 1 mg/day) and carbamazepine (200 mg/day) partially improved aggression (from daily to 1-2 times/week) and sleep (from 3 to 7 hours/night), but social and language impairments remained. There were confounding variables, such as low socioeconomic position, and no standardized developmental assessments were conducted. This single case suggests that excessive early screen time may be associated with or modulate neurodevelopment. Due to the dearth of research and the absence of standardized ASD tests, it is not possible to conclude on screen time. This case illustrates gaps in ASD diagnosis and management and emphasizes the need for awareness campaigns, low-cost therapies, and culturally contextualized interventions.

1. Introduction

Deficits in language, communication, socialization, and restricted/-repetitive behaviours are characteristics of autism spectrum disorder (ASD), a complex neurological disorder. Genetic, metabolic, and environmental factors have significantly increased the rates of ASD diagnosis, even though its etiology is still multifactorial. This has drawn increasing attention to environmental impacts, especially in the digital era. It is believed that excessive early screen use is associated with "digital autism," a pattern of behaviours similar to ASD. This word has no recognised diagnosis, and the data is still associative and evolving [1]. The overwhelming majority of the evidence relating early screen time to developmental outcomes is correlational and observational, with conflicting findings and the possibility of reverse causality [2]. In LMICs like Pakistan, delays in diagnosis, low parental awareness, and limited therapeutic access exacerbate the issue. We report a case of a rural Pakistani child who developed ASD symptoms as a result of excessive early mobile use, which were made worse by medication side effects and the lack of structured intervention. Our objective is to demonstrate the interplay between excessive early screen use, delayed ASD identification, and limited access to behavioural therapy in this rural Pakistani environment.

2. Case Presentation

This case spotlights a 7-year-old girl from a low-income, rural Pashtun home. Up to the age of 2.5, she developed normally, including walking and speaking Pashto at a young age. Her mother, who was past forty when she gave birth, frequently used a mobile device to keep the youngster busy. Pregnancy and delivery went without a hitch, and there were no issues with the newborn. Walking at 13 months and speaking for the first time in 12 months were typical early motor milestones. There was no family history of ASD, intellectual disability, seizures, or mood disorders. The child was first exposed to unsupervised screens when they were about 12 months old. They watched animated cartoons on a mobile device for three to five hours every day, generally without the help of carers. Regression started to show at age three. The youngster replicated aggressive animated behaviours, stopped meaningful speech, and exhibited echolalia in response to cartoon scripts. The neurological evaluation yielded ordinary results. Due to resource constraints, genetic testing, MRI, EEG, and metabolic workup were not performed. Differential diagnoses, such as post-infectious or metabolic regression, were considered but excluded based on clinical history and accessible laboratory tests. She became extremely fixated on birds and kittens, acting violently and erratically towards them. The patient regularly urinated unexpectedly outside the toilet,

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Table 1: Pharmacological treatment

Drug	Indication (Case-Specific)	Starting Dose	Current Dose	Duration	Monitoring (Case-Specific)	Adverse Effects (Observed)	Outcome (Case-Specific)
Risperidone	Irritability, aggression, and self-injurious behavior	0.25 mg BID	0.5 mg BID	6 months	Baseline: ECG, metabolic panel, prolactin; Ongoing: weight, EPS, metabolic labs; caregiver report	Mild EPS (tremor, rigidity), mild weight gain	Significant reduction in aggression and irritability; improved social interactions
Carbamazepine	Mood lability, impulsivity, hyperactivity	100 mg BID	200 mg BID	6 months	LFTs, CBC, serum drug levels, clinical observation	Mild sedation, transient drowsiness	Improved mood stability and decreased impulsive behavior
Procyclidine	Extrapyramidal symptoms secondary to risperidone	1 mg BID	1 mg BID	2 months	Clinical EPS monitoring (rigidity, tremor, abnormal movements)	Dry mouth	EPS resolved; risperidone tolerated better

All doses reflect the patient's individualized pharmacological regimen. Monitoring parameters are based on clinical guidelines for antipsychotics, mood stabilizers, and anticholinergic agents. Adverse effects listed are those observed during the treatment period. Outcomes represent case-specific clinical response as reported by caregivers and treating clinicians; BID, twice daily; ECG, electrocardiogram; EPS, extrapyramidal symptoms; LFTs, liver function tests; CBC, complete blood count.

demonstrating poor toileting awareness and difficulty with self-care routines. She also had difficulty comprehending social standards. Despite her strong dependence on her mother, father, and aunt, she continued to be emotionally detached from other kids. She was diagnosed with pulmonary tuberculosis in 2019 and treated with the normal 8-month regimen. Vidaylin M, Polymalt, and Variant-HB syrups were used as nutritional supplements. The prevalence of ASD symptoms increased in 2020. Even with **(Table 1)** early indications of improvement in language and social cues before age three, prolonged screen time completely halted growth.

Due to the patient's behavioural dysregulation, social impairments, and speech regression, some alternative and concomitant conditions were taken into consideration:

1. Intellectual disability: Taken into consideration, although the initial diagnosis of ASD was more consistent with the behavioural profile and developmental regression.
2. Reactive attachment disorder: This is less likely because early social deprivation was mild.
3. Post-tuberculous neurodevelopmental sequelae: A study of the patient's TB history revealed no focal neurological impairments or abnormalities in imaging.
4. Conduct disorder and disruptive behaviour disorder: Rather than chronic oppositional tendencies, behavioural symptoms were context-specific and associated with developmental regression.
5. Childhood-onset schizophrenia: Uncommon; although there was significant echolalia and self-talk, psychotic symptoms like hallucinations were not seen.
6. Specific language impairment: Multiple domains were engaged in the regression pattern rather than a single language delay.
7. Genetic syndromes (tuberous sclerosis, Rett syndrome, fragile X): Based on clinical results, genetic testing was not recommended because there were no dysmorphic characteristics or any systemic indicators.

Medical consultation was delayed. A children's specialist physician later prescribed risperidone, carbamazepine, and procyclidine.

The patient showed partial improvement in sleep quality and a reduction in aggressive outbursts. While mobile use has stopped, symptoms such as self-talk, solitary play, obsessions with new animals, destructive actions (e.g., throwing chickens into fires, breaking valuables), and violence toward a cousin (leg fracture) continued without remorse. The family never pursued IQ testing or speech therapy due to a lack of facilities and inflated costs. They avoided school enrollment due to behavioral volatility and the subject's reliance on maternal presence. The father and other family members were unable to manage her independently. Her self-talk, object preoccupation, and inability to recognize consequences persisted. She was persistent in acting impulsively and violently towards animals and peers throughout this period, which was consistent with his lack of behavioural control. Children with ASD exhibit different behaviours, and not all of them are the same. Her interactions with animals involved an unhealthy mix of obsession and violence. She failed to recognize the finality of harm, reflecting a disconnection from real-world emotional feedback modeled after cartoon behavior. Language comprehension remains

Table 2: Timeline of Clinical Course and Key Events

Age/Period	Event/Observation
0–12 months	Normal motor development; limited social engagement per caregiver
12–24 months	Introduction to unsupervised cell phone use; screen exposure increasing to several hours/day
2.5–3 years	Peak screen exposure (≥4–6 hours/day); onset of speech regression and reduced social interaction
3 years	TB diagnosis and treatment initiated
3–4 years	Aggressive behaviors escalate; solitary play; echolalia from cartoon content
4.5 years	First clinical evaluation: ASD suspected
After 4.5 years	Screen withdrawal advised; risperidone and carbamazepine started
Following 3–6 months	Reduction in aggression and irritability reported; minimal improvement in speech and social communication

Chronological progression reflects caregiver-reported developmental history combined with clinical documentation; "Screen exposure" refers to passive digital media use (cell phone/tablet); TB, Tuberculosis; ASD, Autism spectrum disorder.

severely impaired. She uses unintelligible speech, mixed with occasional copied Urdu/English words. She communicates her needs by dragging family members to the object. Religious modesty norms are unrecognized; she urinates in inappropriate settings. There is no fear of darkness or strangers, though she stops her actions when she hears familiar voices. Caregivers initially resisted psychiatric medication, fearing addiction and sedation. After risperidone and carbamazepine, caretaker reports showed that the frequency of violent outbursts decreased from daily to once or twice a week. The average amount of sleep per night increased from 3–4 to 6–7 hours. Neither reciprocal social contact nor expressive language showed any discernible improvement. Due to limited resources in the rural therapeutic context, no standardized behavioural rating scales were used. Therapy was discontinued for a period due to caregiver mistrust until physicians re-explained the drug mechanisms. The mother now monitors her full-time. Side effects like drooling occur only occasionally. Behavioral therapy is absent due to a lack of awareness about psychological treatment and financial constraints.

The child's developmental trajectory might have been affected by confounding variables. While the child's history of pulmonary tuberculosis and related nutritional deficiencies may have contributed to transient developmental delays, advanced maternal age (>40 years) is a moderate risk factor for ASD. Deficits in social learning and cognitive stimulation were exacerbated by low socioeconomic position and a rural setting with limited access to early interventions and schooling. Potential genetic predisposition cannot be completely ruled out, even though there was no family history of neurodevelopmental problems. Despite these variables, a diagnosis of ASD is most consistently supported by the pattern of early speech regression, ongoing deficiencies in social reciprocity, repetitive behaviours, and emotional detachment. Confounders may have affected symptom severity, but they do not explain the fundamental clinical presentation.

The child's clinical progression was divided into pre- and post-intervention stages to give a more comprehensible timeline. Early developmental milestones, the onset of regression, the diagnosis of tuberculosis, and peak unsupervised screen time were all part of the pre-intervention phase. The results of screen withdrawal and the start of risperidone and carbamazepine were compiled in the post-intervention phase. **(Table 2)** shows a condensed timeline of momentous events.

A child psychiatrist used the DSM-5 criteria to diagnose ASD. The diagnosis is regarded as a clinical working diagnosis because standardized instruments (such as ADOS-2, CARS-2, and Vineland) were not used due to resource constraints. The results of the hearing and vision tests were normal. There was no way to assess IQ [3, 4].

When our child's speech and social interactions declined, we were concerned and perplexed. Her everyday interactions and communication have improved with treatment and support, despite the stressful delay in receiving specialist care.

The patient will continue to receive multidisciplinary care, including occupational therapy, behavioural therapy, and speech and language intervention. Standardized developmental evaluations, carer interviews, and monthly medical visits will all be used to track progress. Interventions will be modified in response to gains in social interaction, communication, and adaptive behaviour. To maximize home-based techniques and ensure continuous developmental stimulation, the care team will also advise and assist the family.

At the most recent follow-up (age 7 years), the patient still exhibits severe impairments in expressive language and social communication, along with a poor comprehension of social norms and persistent repetitive behaviours. After starting medication, her aggression and sleep have improved, but she is still reliant on her primary carer for daily tasks. The family has been recommended for speech-language intervention, behavioural treatment, and occupational therapy. Monthly medical follow-up, home-based developmental stimulation, and ongoing drug monitoring are all part of ongoing care. Long-term objectives include maintaining safety and lowering aggressive behaviours while gradually enhancing social interaction, adaptive functioning, and linguistic abilities.

3. Discussion

This case suggests that, rather than acting as a direct cause, extensive, unsupervised early-screen exposure may have coincided with or worsened underlying neurodevelopmental vulnerabilities. No causative relationship can be deduced due to the lack of standardized ASD measures, the limited diagnostic workup, and the single-case aspect of this report. Therefore, rather than being confirmed, the observations reported here should be seen as creating hypotheses. High early screen usage is linked to delays in language, communication, and executive functioning, according to more recent research, with some studies indicating dose-response correlations [5]. However, since reverse causation is plausible, children with developing developmental vulnerabilities might also use screens more; causality is still unclear. These results highlight the necessity of interpreting single-case reports like the current investigation with caution[6, 7]. Our subject's mimicry of cartoon aggression, nonsensical speech, and erratic emotional responses reinforces this theory. While classic ASD involves social disengagement and restricted interests, it entails a learned imitation of exaggerated digital personas, intensifying miscommunication and inappropriate behavior. Pharmacologically, risperidone is effective in reducing aggression and improving mood stability in ASD[8]. Even though risperidone is known to induce weight gain, no inferences regarding medication-related anthropometric changes can be made because systematic weight or BMI monitoring was not regularly recorded in this instance. Tolerance with sedative effects is also common in pediatric use. Carbamazepine adds antiepileptic and mood-stabilizing effects but does not address core deficits in language or adaptability. This patient's complete dependence on maternal presence and inability to integrate with educational or social settings mirrors the isolation faced by massive neurodivergent children in under-resourced communities. Carer reluctance to medication, which frequently stems from religious or traditional misunderstandings, further complicates care. Psychotropic drugs may be perceived by carers as addictive or mind-altering, necessitating the development of trust and thorough explanation. Families are often left without support when there are no organized educational possibilities for managing ASD. A lack of emotional foundation is highlighted by the child's inconsistent behaviour, which includes hurting animals without feeling guilty and acting violently towards other children. Although there is evidence that early environmental input may affect socio-emotional development during crucial neuroplastic periods, the limited diagnostic workup in this instance makes these conclusions questionable [9, 10]. Without early social engagement, these children fail to recognize consequences, empathy, or guilt. Several differential diagnoses were assessed in light of potential causes for the child's behavioural dysregulation and regression. Due to economic constraints, no rigorous cognitive testing was conducted, but intellectual disability is still a potential contributing factor. Although conduct disorder was taken into consideration, it

is less likely due to the early beginning of regression, severe deficiencies in social reciprocity, and lack of goal-directed violence. Although environmental neglect and attachment-related problems were investigated, the child showed preferential attachment towards primary carers, which is not consistent with global attachment impairment. There were no clinical communication delays, limited interests, and repetitive behaviours that most closely matched the diagnostic diagnosis of ASD, with heavy early screen exposure worsening symptoms, even though long-term sickness and psychosocial deprivation may have exacerbated developmental issues. Cost, stigma, and a shortage of speech and occupational therapists impede therapeutic support in Pakistan. Structured interventions for girls with cognitive problems are limited by cultural responsibilities [11, 12].

This report is constrained by the lack of objective pre- and post-intervention outcome measures, quantified screen-time data, limited diagnostic investigations, and causal inference. It should be viewed as hypothesis-generating, pointing to areas that warrant further investigation.

4. Conclusions

The case study shows that medication treatments were unable to address the complex behavioural and social issues identified in a child without access to organized behavioural therapies. It also underscores the potential hazards associated with extensive, unsupervised early-screen exposure. Before making more generalizations about early screen exposure and neurodevelopment, further study in larger, well-designed cohorts is necessary, as these findings raise hypotheses.

Conflicts of Interest

The authors declare no competing interests that could have influenced the objectivity or outcome of this research

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Informed consent

Written informed consent was obtained from the patient's parents.

Large Language Model

To improve language, the authors used only Grammarly. The authors evaluated, validated, and approved all content. AI tools were not applied to data interpretation or clinical decision-making.

Authors Contribution

MR collected and organized all clinical data for the case report. NUR provided overall supervision, clinical guidance, and critical revisions. MA drafted and wrote the complete case report and finalized the manuscript.

Data Availability

In compliance with patient privacy laws, Dr. Naeem Ur Rehman retains the medical records that support this case report. The corresponding author may provide de-identified data upon reasonable request and with the necessary ethics permission.

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