


# Early Media Overexposure Syndrome Must Be Suspected in Toddlers Who Display Speech Delay With Autism-Like Symptoms

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Sylvie Dieu-Osika, MD<sup>1</sup>, Marie-Claude Bossière, MD<sup>2</sup>, and Eric Osika, MD<sup>3</sup> 

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## Background

The identification of developmental problems in a child's acquisition of speech is a core part of clinical observation. Conditions that can account for speech problems can be divided into primary, those for which no other etiology can be found, and secondary. Autism spectrum disorders are an example of such a secondary condition, and when a child is observed with speech delay, it is essential to pay attention to their socially interactive and communicative skills. In this article, we suggest that early media overexposure (EMO) is another condition of this sort.

## Case Presentation

A 25-month-old boy was observed during a general pediatric visit, following parental concern over speech delay, feeding, and sleep disorders. He was a first child without special neonatal history, looked after by his mother at home with scarce outdoors activities (the pregnancy of a second child occurred when he was only 9 months old and the mother felt too tired to go outside). Parents reported typical "infantile anorexia" with a child who refused to eat adequate amount of food for more than 6 months and who lacked interest in food and showed strong interest in exploration instead. The sleep schedule was erratic with very late sleep onset and many wakes during the night. Neurological examination was normal, except for the items of language and more largely social behavior. He presented as sad and restless, and during all adult initiated interactions, it was difficult to meet his gaze and he had no joint attention. He neither sought after nor desired adult interactions, but there was a small observable improvement in his responsivity toward the end of the session, probably due to the close attention paid to him. Following discussion with his father, it was noted that he did not engage in structured play, but preferred to "tinker repeatedly with locks,"

suggesting stereotypical repetitive activity. Formal language testing was not possible as he did not use any verbal language although his parents stated that he would say a few isolated words at home "water," when he was thirsty, or "not that." Parents commented that he always held a hard object and used to turn the wheels of little cars close to his eyes. Although there was no evident stereotyped behavior during examination, parents commented that he sometimes bit himself when he was over-excited. During the consultation, when asked to draw, he evidently found the close proximity of adults challenging and started to draw on the table and then on books but not on the paper presented to him. He did not respond to "don'ts" but did respond to regular "increase" in volume of voice to "no." He stopped, suspended his movement, and appeared to be thinking, which suggested an ability to hear and to be considering those around him.

He received normal results in the audiogram performed a few days later. Parents were asked to complete the Ages and Stages Questionnaire, Third Edition (ASQ-3). The ASQ-3 is a widely used, parent-reported screening measure.<sup>1</sup> The ASQ-3 identifies developmental progress in 5 domains: communication, gross motor, fine motor, problem solving, and personal-social. The questionnaire includes 30 items scored as yes, sometimes, or not yet on questions asking about a child's ability to perform a task. All ASQ-3 results of the child except gross motor measure were below the cutoff score expected for the age.

Because of the boy's autism-like symptoms, a diagnostic assessment tool was asked to an experienced child psychiatrist. The Childhood Autism Rating Scale

<sup>1</sup>Jean Verdier Hospital, Bondy, France

<sup>2</sup>Praticien Hospitalier, Paris, France

<sup>3</sup>Saint Camille Hospital, Bry-sur-Marne, France

### Corresponding Author:

Eric Osika, Service de pédiatrie, Hôpital Saint Camille, 2 Rue des Pères Camilliens, Bry-sur-Marne 94360, France.

Email: eric.osika@gmail.com



(CARS) is a 15-item behavioral rating scale and each item covers a particular characteristic and behavior, with a first edition validated in French.<sup>2</sup> Scores of less than 29, between 30 and 36, and above 36 on the CARS are considered indicative of normal, mild to moderate autism, and severe autism, respectively. In this first examination, the CARS gave a score of 36, which placed this boy in the “mild to moderate autism” category. None of the 15 items were normal; poor results were obtained in all the social categories (social relations, imitation, emotional responses, language) and in “level of activity.” A family screen time questionnaire revealed that he had been exposed to background all the day long, as well as foreground television (he watched the TV News with his father after work) since his first 6 months and that he was habitually watching YouTube Kid alone on the parents’ smartphone for 3 hours a day, especially during mealtime (as he was suffered of feeding disorders). On the family’s screen questionnaire, his mother reported using her mobile phone herself for more than 3 hours a day while his father reported essentially watching the TV.

Subsequently, his parents were asked to completely stop any and all screen and media exposure for all the family (the sister is 6 months old). Written pieces of advices were provided to the father by the pediatrician to increase outdoors activities, play with traditional toys (as balloons or truck), and foster social interaction with same-age peers. A regular schedule for meals and sleep times was also recommended. Two and a half months later, the parents reported to the pediatrician that, as asked, they have stopped giving their smartphone and that the television was now only switched on when their son was asleep. Sleep quantity and quality have improved. At the examination, the boy was more stable, less agitated, and was now able to remain focused on his activities for a longer period of time. His language was observed to be somewhat jargonized, but with intentional prosody, and in which it was now possible to recognize words and groups of words. His play activities had become more varied. During this interview, he spoke to the adult and pointed his finger at the waiting room searching for a joint attention, in an attempt to tell a story in which the words “balloon” and “truck” appeared. In explanation, his father stated that that they had left a balloon and a truck in the waiting room. The boy’s language seemed to fulfill its communicative function. Complex instructions given by his father were well understood and executed. When he was asked to build a tower of 6 cubes, the boy obeyed, displayed observable signs of pleasure, and made the activity last, indicating an increased interest in toys. He made seemingly easy and often sustained eye contact with those around him and was positively responsive to smiles. The

CARS assessed by the same child psychiatrist gave him a new score of 21, which placed him in the “non-autistic” category. Some items were categorized as close to or completely normal (body use, nonverbal communication, and level of activity), and the overarching impression was one of a non-autistic child. On the other hand, his language remained abnormal. Pieces of advice were repeated to parents to support the progress, and 6 months later, the child was integrated thanks to the intervention of the pediatrician in a public day care center.

A new ASQ score is assessed at the age of 3 years: the communication, problem solving, and personal-social scores are normal. Only the fine motor measure is still under the cutoff score expected for the age. Screen time is now limited to 20 minutes a day.

## Discussion

There is now evidence that excessive screen time can be harmful to children’s social-emotional, attentional, and cognitive functions.<sup>3</sup> Some studies have reported autism-like symptoms in the most severe cases, findings that coincide with the above-described case. Wu found that children exposed to a screen time of more than 2 hours per day had a significantly increased risk of having emotional and prosocial problems, as well as behavioral symptoms of autism (using the Clancy Autism Behavioral Scale).<sup>4</sup> Chonchaiya et al reported that infants aged between 6 and 18 months and who had been exposed to television since the age of 6 months displayed higher levels of pervasive developmental problems (using the Child Behavior Checklist).<sup>5</sup> Recently, Yurika et al reported a 5-year-old boy, who, having been exposed to media during his early development, had later displayed neurobehavioral symptoms that mimicked autism. She used, as we did, the Child Autism Rating Scale.<sup>6</sup> Similar observations have been reported and discussed by clinicians worldwide.<sup>7-9</sup>

From our discussion of case study as well as previously published studies in this field, we describe a new condition called “Early Media Overexposure” syndrome. This syndrome is caused by overexposure to media at an early age. It affects young children and it associates speech delay with autism-like symptoms. We suggest, however, that the condition can be reversed by way of a total ceasing of media and screen exposure.

The initial reason for the general practice consultation in our case was speech delay. The examination found symptoms that could evocate one of autism spectrum disorders and was confirmed by the Childhood Autism Rating Scale, an accurate instrument for the screening and diagnosis of childhood autism.<sup>10</sup> During the discussions with parents, the screen exposure was

found to have begun early in the child's life. The child was found to have been intensely exposed to screens, with most experiencing the presence of consistent background television, as well as heavy use of mobile phones. In connection with this, parents were found to be exposed to their own mobile phones for an excessive amount of time during the time shared with their child. This may have deeply disrupted family interactions and could explain the language delay and social disturbances displayed by the child. Background television indeed has a profound effect on children and families. It diminishes the quality and quantity of parental communication.<sup>11,12</sup> This "barrier effect" to interactions is related to the broader notion of "technoference."<sup>13</sup> Furthermore, handheld mobile use by the child and heavy media use by the parents may have severely aggravated the "barrier effect" between parents and child, challenged essential interactions, and led to our clinical findings.<sup>14</sup>

Klin and colleagues have well described that the context of the infant-caregiver dyad is the catalyst for subsequent development: initially spontaneous reflex-like responses transition into remarkably sensitive and contingent social action, all within the first month of life. Interestingly, these transitions may be disrupted in autism spectrum disorders.<sup>15</sup> The screens offer no reciprocal social reward such as a returned smile or eye gaze for looking at the eyes of the projected individual, and no opportunities for joint attention, turn taking, or the complexities of social engagement. Heffler and Oestreich have largely discussed the potential mechanisms by which screen exposure could act as a potential "environmental trigger" for neurodevelopmental disorders. Because of the lack of real-life social interaction, and limited multisensory input, the audiovisual materials developed neuronal pathways compete with preference for social processing, negatively affecting development of social brain pathways, and causing global developmental delay. This heightened neural response to the sensory exposure alters the infant's behavior, and affects further social and cognitive growth through an aberrant trajectory of neurodevelopment.<sup>16</sup>

The 2-month-long media fast prescribed by the pediatrician after the diagnosis of "EMO" syndrome, without any other alteration in conditions, led to a rapid improvement. This is evident through the normalization of the autism score. However, there is a possibility that the differences between the 2 CARS measures found could be due to causes other than the abolition of screen time. However, both tests were performed by the same examiner at a close interval, and during the interview, no alternate intervention during this period (eg, by a speech therapist or psychologist) was reported by the parents. It is also clear that some children who are overexposed to screens at an early age may be children with preexisting

autism spectrum disorders, as these children are known to have a particular predilection for screens.<sup>17</sup> We are convinced, however, that an abolition of screen use should be introduced to every child displaying the clinical characteristics we note, as the recovery of interactions between parents and children associated with a media break are of benefit to everyone.

The gravity of these clinical findings confirms the importance of the recommendations of the American Academy of Pediatrics, who, for a long time, have discouraged screen exposure for very young children.<sup>18</sup> It is no longer possible to ignore discussions regarding the harmful effects of screens on young children or for pediatricians, to "understand the evolution of digital technology without demonizing," as in some recommendations from pediatrics institutions.<sup>19</sup> What should be encouraged is a sharing of this information by parents. Therefore, all families should be informed, from maternity unit, about the risks of early exposure of their child to screens. Our findings show that such overexposure could lead to symptoms that mimic autism spectrum disorder and that these symptoms can be reversed or improved by a break from media and screen use. We are convinced that this removal of media must be thorough and be implemented early on to be effective. In turn, this could only be done if pediatricians systematically ask parents about screen time exposure and systematically pay attention to autism-like symptoms.

### Author Contributions

SDO: Contributed to conception and design; critically revised manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

MCB: Contributed to acquisition; critically revised manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

EO: Contributed to conception and design; drafted manuscript; critically revised manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

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### Ethical Approval

Ethics committee and institutional review board approval are not required.

## Informed Consent

Written informed consent was obtained from the parents of the patient for the publication of this case report.

## ORCID iD

Eric Osika  <https://orcid.org/0000-0003-1474-0643>

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