

BAR-ILAN UNIVERSITY

**Behavioral Changes during Fever in Children
with Autism Spectrum Disorder**

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Abstract

Throughout the years, parental reports, therapists and clinical psychologists reported a behavioral improvement among children who are diagnosed on the autistic spectrum during febrile episodes, such as: the child's initiative for communication, longer attention spans, higher degree of calmness, use of more words per sentence and more (Brown, 1999; Cotterill, 1985; Sullivan, 1980). Although the febrile phenomenon is known among parents and therapists of children diagnosed on the autistic spectrum, the literature indicated that this phenomenon was academically examined only in one study (Curran et al., 2007).

Curran and colleagues (Curran et al., 2007) examined 30 children diagnosed on the autistic spectrum between the ages of two to eighteen and found an improvement in the "stereotypic behavior", "inappropriate speech", "irritability" and "hyperactivity" factors during fever. However, deterioration was found in the "lethargy and social withdrawal" factor during fever.

The current study aimed to examine whether there is an improvement in behaviors characterizing autism during a disease with febrile episodes as opposed to a routine without illness or fever and to expand the findings by Curran and colleagues. The factors examined in the study included core factors of a disorder on the autistic spectrum, such as communication and inter-personal interaction, lethargy and social withdrawal, repetitive and restrictive behaviors, as well as secondary factors to the disorder, such as irritability and hyperactivity. The study further examined whether this phenomenon subsists only among children diagnosed on the autistic spectrum or whether children with typical development also experience a behavioral change during a feverish disease.

The study examined 60 children diagnosed on the autistic spectrum and 45 children with typical development between the ages of three to eight during a disease with febrile episodes as opposed to a routine without illness or fever. The study was based on a behavioral assessment of the children according to the following questionnaires: Aberrant Behavior Checklist (Aman, Singh, Stewart, & Field, 1985) and a "fever and autism" questionnaire composed for the purpose of the study. To facilitate completion of questionnaires, telephone calls were made to parents wherein they were asked to participate in the research project. Parents who agreed to participate,

and whose children had disease with febrile episodes within the three months following the phone conversation, completed the questionnaire together with the researcher. The parents were asked about the behavior of the child during the disease with febrile episodes, and about the child's behavior without illness or fever

In comparison between children diagnosed on the autistic spectrum and children with typical development during a disease with febrile episodes as opposed to a routine without illness or fever, children with typical development demonstrated lethargy and social withdrawal such as seclusion and apathy during a disease with febrile episodes as opposed to a routine without illness or fever. In opposition, children diagnosed on the autistic spectrum exhibited an improvement in their communicative abilities, interpersonal interaction, lethargy and social withdrawal during a disease with febrile episodes as opposed to a routine without illness or fever. The improvement in the level of communication was demonstrated in the attempt to communicate with parents, searching for comfort, less of a desire for seclusion, less apathy towards the environment, etc. Furthermore, improvement was seen in the restricted and repetitive behaviors during a disease with febrile episodes among children diagnosed on the autistic spectrum. An improvement was found in the stereotypic behavior, inappropriate speech, repetitive stereotypic speech and disorder in sensory modulation factors, during a disease with febrile episodes as opposed to a routine without illness or fever. In a division of the children diagnosed on the autistic spectrum according to levels of function, it was found that high - functioning children demonstrated a greater improvement in stereotypical repetitive speech compared to low - functioning children and children with typical cognitive level demonstrated a greater improvement in stereotypical repetitive speech compared to children comorbid to intellectual disability. In a division according to the linguistic level of verbal and non-verbal children who were diagnosed on the autistic spectrum, it was found that verbal children demonstrated a greater improvement in stereotypical repetitive speech than non-verbal children. In the behavioral fixation factor no difference was found between a time of a disease with febrile episodes as opposed to a routine without illness or fever.

In the factors secondary to the disorder, such as irritability characterized by aggressiveness, offensiveness, self-harm and hyperactivity characterized by excessive activity and lack of ability to rest, an improvement was found in time of a disease with febrile episodes among children diagnosed on the autistic spectrum. In addition, the

hyperactivity level among children with typical development was also found to be lower during a disease with febrile episodes.

In examining the connection between the improvements in autistic behaviors, it was found that as the hyperactivity decreases, there is a greater improvement in lethargy and social withdrawal, as well as in interpersonal interaction and the child gave a more positive impression. It was further found that as the irritability behavior decreased, there is a greater improvement in lethargy and social withdrawal, a greater improvement in interpersonal interaction, a greater positive impression from the child and a decrease in stereotypical behavior. These findings show that a correlation between these factors exists. Since it is unknown whether the improvement in hyperactivity or irritability behavior preceded an improvement in communicative behaviors, it is important to observe that a correlation exists; these are not causal relations.

Furthermore, in examining the differences based on the cause of illness, it was found that the level of improvement in “lethargy and social withdrawal” among subjects whose illness included one of the following: ear infection, throat infection, common cold, dysentery and infectious disease, was significantly higher than that of subjects whose cause of illness was unknown.

The findings of the study indicate a significant improvement during a disease with febrile episodes in the core factors of a disorder on the autistic spectrum: A. Interpersonal communication and interaction, lethargy and social withdrawal. B. Motoric repetitive behavior, stereotypical repetitive speech and over sensitivity/lack of sensorial sensitivity, as well as in behaviors characterizing children on the autistic spectrum that are not included in the DSM-5 definition: irritability and hyperactivity. The current study strengthens the study of Curran and her associates, who found an improvement during a disease with febrile episodes in stereotypic behavior, incoherent speech, irritability and hyperactivity among children who were diagnosed on the autistic spectrum. This study further adds that there is an improvement in additional autistic behaviors relating to the communicative and behavioral aspects of children diagnosed on the autistic spectrum as well as lethargy and social withdrawal, communications and inter-personal interaction and sensory modulation.

The analysis of results included several divisions. First, for all children without internal division in each group. Second, for children who reported a disease with febrile episodes up to thirty days prior to filling out the questionnaires. In these two divisions, identical results were found for each of the examined factors. In addition, in the autistic group it was found that majority of parents of children diagnosed on the autistic spectrum (48 out of 60) did not anticipate a behavioral change in their children due to a fever, compared to ten parents who did (neither parent provided information). The parents who anticipated a change did so in light of previous feverish diseases in which they noticed a behavioral change in their child, due to the fever. Therefore, in analyzing the results an additional division was construed just for those who did not expect a change in their child's behavior due to fever. In this division, it was found that the parents noticed an improvement in all of the examined factors, except for interpersonal interaction. In this factor, no difference was found between a time point of a disease with febrile episodes and a routine time point without fever among children diagnosed on the autistic spectrum. This may indicate that the most meaningful thing parents pay attention to is a change in their interaction with their children. Parents who were familiar with the phenomenon reported so in light of previous feverish diseases during which they observed an improvement in their children's communicative abilities. Parents described children who explain themselves better, who want their parents' company, seek out more attention, initiate conversation, etc.

Certain theories attempt to explain the reason for a behavioral improvement in children diagnosed on the autistic spectrum by referring to the increase in body temperature, change in the immune system during febrile episode, change in metabolism, etc. However, the mechanism at the basis of this phenomenon remains unknown. It is important to continue to raise awareness of this phenomenon while seeking out clues for mechanisms and possibly potential new treatments for the autistic population.