

Aggressive Behaviors and Verbal Communication Skills in Autism Spectrum Disorders

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Abstract

Aggressive behavior is a common problem among children with autism spectrum disorder (ASD) and could negatively affect family functioning and school and social competence. The aim of the present study was to investigate the relationship between aggressive behavior, such as self-aggression and other-aggression, with verbal communication ability and IQ level in children with ASD. The sample examined in this study included 88 children with a diagnosis of ASD. For the purposes of our study, much attention was focused on individual items of the Autism Diagnostic Observation Schedule and the Autism Diagnostic Interview–Revised that were useful to evaluate the aggressive behavior. We have not found any association between aggressive behavior (other-aggression and self-aggression) and the absence of language or low IQ in children with ASD. Thus, the degree of severity of autism is probably the most important risk factor for this behavior.

Keywords

autism spectrum disorder, ASD, neurocognitive endophenotype, aggressive behaviors, verbal communication skills

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Introduction

Autism spectrum disorder (ASD) is a childhood-onset neurodevelopmental disorders characterized by persistent deficits in social communication and social interaction across multiple contexts and by restricted, repetitive patterns of behavior, interests, or activities.¹ The presence of co-occurring problems as behavior disorders can greatly affect the complexity of the core symptoms of the condition. A challenging behavior that often accompanies ASD is aggressive behavior that include self-aggression and other-aggression.

In the autistic disorder, aggression and its persistence over time may result in part from the absence of language and/or communication difficulties, as well as the “deficit of theory of mind,”² that is, a deficit of abstraction, which causes in autistic individuals lack of empathy and inability to attribute mental states to oneself and to others and to predict behavior on the basis of these states.

Aggressive and destructive attitudes are the main causes of stress among parents and children with developmental disorders, particularly ASD children.³ Moreover, aggression increases the risk of child

physical abuse by caregivers, including parents and other people who live with the children themselves.⁴

Aggressive behaviors have a negative impact on teachers’ educational efforts⁵ as they reduce learning opportunities of the child, even when educational interventions are well-conducted, and they can cause a condition of emotional breakdown and burnout among both ordinary and support teachers; these results allow us to understand how aggression may interfere with instruction and educational interventions on the child, thus preventing possible improvements that could be made in all sectors of his development.

Depending on the serious consequences associated with the presence of aggression, it is therefore necessary to investigate this matter among children with ASDs. Dominick et al showed that ASD children with a higher

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incidence of atypical behaviors (capricious, aggressive, and self-aggression attitudes) are most likely to show a lower nonverbal IQ, reduced communication skills, greater impairment in social interaction, and a greater number of stereotyped behaviors.⁶ Moreover, in stressful situations, low-functioning ASD children tend to release stress through aggressive behaviors, where instead subjects with a normal development regulate and express their stress through cognitive skills (such as coping mental strategies, symbolization abilities, representation, and anticipation of stressful situation), social interaction, and verbal and nonverbal communication.⁷ Communication is the process of exchanging information in different forms with other people. It is not limited to language but includes nonverbal communication and understanding of symbols. Infants with ASD do not seem to be as aware of language, and they tend to use gestures less often and in less meaningful forms of communication.⁸ Children with ASD who develop functional communication often display atypical communication styles, such as echolalia, contact gestures, pronoun reversals, and neologisms. It is likely that these develop because these children have a limited understanding of the meanings and intentions of symbolic forms of language.⁹ The impairments in ASD are often described as qualitative impairments. Garcia-Perez et al reported that when matched for age and developmental language level to peers with mental retardation, children with ASD were very comparable in objective measures of communication, such as head nodding or shaking while speaking, looks to the interviewer, and total number of smiles, but they scored significantly lower on subjective measures of communication, such as engagement and conversation flow.¹⁰ Children with ASD may use language to meet needs and respond to questions, but they tend to make comments less often.¹¹ They use language as a functional tool, such as for requesting items.¹² In fact, they may not anticipate engagement at all and tend to declare or express their needs or wants without any expectation for others to engage.⁹

The frustration of being unable to communicate with others can lead to behavioral outbursts in some children. These behaviors have a wide range of expression and can be aggressive physical behaviors, self-harming behaviors, or loud vocalizations. These challenging behaviors are proposed to be a form of communication when there are breakdowns in the process and the children are not getting their needs met.^{7,9} Moreover, in a longitudinal study, Estes et al found that children with verbal or nonverbal IQ impairment at age 6 were more likely to demonstrate externalizing behaviors at age 9, suggesting that cognitive functioning may play a causal role in the ontogeny of behavior problems including aggression.¹³

The aim of the study was to investigate if the communication impairment and cognitive impairments (ie, high vs low functioning) increase the prevalence of aggressive behaviors (self-aggression and other-aggression).

Materials and Methods

The total sample examined in this study includes 88 children referred to the Child and Adolescence Neuropsychiatry Unit, University “Aldo Moro” of Bari. Parental informed consents were obtained from all participants. We only selected children with a diagnosis of ASD according to *DSM-5* criteria, confirmed by the Autism Diagnostic Interview–Revised (ADI-R)¹⁴ and the Autism Diagnostic Observation Schedule (ADOS).¹⁵ Children with ascertained neurological disorders (ie, epilepsy, cerebral palsy) and genetic syndromes (ie, X fragile, tuberous sclerosis) were excluded from this sample. Diagnoses were made by child psychiatrists specialized in assessment of ASDs, through direct clinical observation and diagnostic tests; diagnostic instruments administered to the children were the following:

- ADI-R and ADOS, used to confirm ASD diagnosis and to evaluate variables inherent in language, social interaction, stereotypies, and aggression
- Leiter-R, Wechsler Intelligence Scale for Children (3rd edition), and Wechsler Preschool and Primary Scale of Intelligence (3rd edition), used to calculate IQ and thus distinguish high-functioning (HF) children from low-functioning (LF) ones

ADI-R is a standardized, structured diagnostic interview administered by a trained psychiatrist to the main caregiver of child with suspected autism (usually mother and/or father); the focus is child development history and current presentation of the main symptoms of ASDs, in order to obtain the ASD diagnosis.

Cutoffs are set as a function of a diagnostic algorithm based on *ICD-10* and *DSM-IV* guidelines; higher scores indicate an increase in the number and severity of typical behaviors of ASD children.

In this study, we focused on ADI-R individual items, useful for assessing current and past aggressiveness toward the caregiver, other people, and also toward oneself:

- ADI 81: aggression toward caregivers or family members
- ADI 82: aggression toward other people
- ADI 83: self-aggression

Possible scores attributed to these behaviors range from “0” (no aggression or rare episodes that do not constitute a serious problem) to “3” (violence with use of tools).

The presence of a self-aggressive behavior was considered if the children obtained a score ≥ 1 at ADI 83. The presence of others-aggressive behavior was considered if the children obtained a score ≥ 1 at ADI 81 or ADI 82.

ADOS was administered to all participants in this study in order to describe severity of ASD key-symptoms; this test is a standardized and semistructured observation of ASD main features in the following areas: Language and Communication (A); Reciprocal social interaction (B); Total A + B; Imagination and creativity (C), stereotyped behaviors and restricted interests (D), which do not contribute to the diagnostic algorithm.

The score (from 0 to 3) for each question is given by a diagnostic algorithm that provides cutoff values for diagnosis of 2 subcategories: “Autistic Disorder,” when cutoffs for autism are reached or exceeded in social and communicative domains (ADOS-A and B); “pervasive developmental disorders (PDD)-NOS,” when cutoffs for ASDs are reached or exceeded in communication (ADOS-A), social (ADOS-B), and linguistic (TOT A + B) domains.

Specifically, it is necessary to evaluate ADOS individual items to judge aggressive behavior: “D3,” index of “self-aggressive behavior” (“0” = no attempt to injure themselves; “1” = rare and/or uncertain self-aggression behavior; “2” = clear self-harm). “E2,” index of “tantrums, aggression, destructive or negativistic behavior” (“0” = absence of behavior; “1” = occasional tantrums; “2” = serious and repetitive tantrums and aggressive behaviors). The presence of self-aggressive behavior was considered if the children obtained a score ≥ 1 at D3. The presence of other-aggressive behavior was considered if the children obtained a score ≥ 1 at E2.

Each child is given 1 of 4 different ADOS modules, selected according to age and language level of participants.

Statistical Analysis

Descriptive statistics were used to summarize the variables studied and the characteristics of the subjects. Chi-square test was used to evaluate the presence/absence of other-aggression or self-aggression in our sample (in the total sample and in each group), according to items ADI 81, ADI 82, and ADOS E2 for other-aggression, and ADI 83 and ADOS-D3 for self-aggression. In order to identify possible differences among variables of the aforementioned tests, we used the χ^2 test.

A *P* value of less than .05 was considered as statistically significant. For statistical processing, we used the

data processing program the Statistical Package for Social Science, Version 20.0.

Results

The sample ($N = 88$) included children aged from 2 years and 4 months to 11 years and 9 months, with a mean age of 4.75 years, including 7 females and 81 males. On the basis of direct observation and of ADI-R items B (language and communication), the total sample was divided into 2 groups of equal number ($N = 44$): “Verbal Group [V]” and “Nonverbal Group [NV].”

According to IQ we established 2 categories within each group, setting “ $IQ < 80$ ” as the cutoff.

The “High-functioning ASD [HF]” consisted of 51 children, which included all children with a normal IQ level. The “Low-functioning ASD [LF]” consisted of 37 children with any degree of mental retardation.

The sociodemographic characteristics and comparison between group at ADI and ADOS items are reported in Table 1.

Other-Aggression

Verbal and Nonverbal Groups. In relation to the Verbal Group, the percentage of children with aggressive behaviors to caregivers or family members (ADI 81) was 47% and 18% to other people (ADI 82), while in the Nonverbal Group we found that the 47% of children showed aggressive behavior to caregivers or family members (ADI 81) and 25% to other people (ADI 82). The results of ADOS showed that in the Verbal and Nonverbal Groups the percentages of other-aggression (ADOS E2) were 22% and 38%, respectively. However, no significant differences between the Verbal and Nonverbal Groups were found.

HF and LF Groups. Comparing HF and LF groups, we found that the HF group showed aggressive behaviors to caregivers or family members (ADI 81) in 54% and aggressive behaviors to other people (ADI 82) in 23%, while the LF group showed aggressive behaviors to caregivers or family members (ADI 81) in the 37% and aggressive behaviors to other people (ADI 82) in 18%. The results of ADOS showed that the percentages of other-aggression (ADOS E2) in the HF and LF groups were 27% and 35%, respectively. No significant differences between the HF and LF groups were found.

Self-Aggression

Verbal and Nonverbal Groups. Self-aggression (ADI 83) was found in 34% of Verbal Group and in 27% of the Nonverbal Group. The results of ADOS showed that the

Table 1. Sociodemographic Characteristics and Comparison Between Groups at ADI-R and ADOS Items.

	Verbal Group (N = 44)	Nonverbal Group (N = 44)	P	High Functioning (N = 51)	Low Functioning (N = 37)	P
Age	5.07 ± 1.9	4.5 ± 1.9	.21	4.03 ± 1.7	4.41 ± 2.1	.34
Gender			.42			.39
Male	46	35		48	33	
Female	5	2		3	4	
ADI_81	47%	47%	.11	54%	37%	.11
ADI_82	18%	25%	.43	23%	18%	.6
ADI_83	34%	27%	.48	35%	24%	.27
ADOS_D3	2%	9%	.16	2%	10%	.07
ADOS_E2	22%	38%	.1	27%	35%	.44

Abbreviations: ADI-R, the Autism Diagnostic Interview–Revised; ADOS, Autism Diagnostic Observation Schedule.

percentages of self-aggressive behavior (ADOS D3) in the Verbal and Nonverbal Groups were 2% and 9%, respectively. No significant difference between the Verbal and Nonverbal groups were found.

HF and LF Groups. The HF group showed self-aggressive behaviors in 35% (ADI 83), while self-aggressive behaviors were found in 24% (ADI 83) of the LF group. The results of ADOS showed that the percentages of self-aggressive behavior (ADOS D3) in the HF and LF groups were 2% and 10%, respectively. No significant differences between the HF and LF groups were found.

Discussion

In this study, we investigated aggressive behavior in a group of 88 children diagnosed with ASD, in order to analyze the possible correlations with the verbal communication and cognitive ability. First of all, it should be noted that about half of the children with ASD in our sample showed other-aggression attitudes, where the most frequent targets are the caregivers. The other-aggression behaviors in our study was mainly reported by parents rather than observed by the clinician during the ADOS, having a higher prevalence among the nonverbal children, but there was no significant difference when compared to the verbal subjects. Challenging behaviors are proposed to be a form of communication when the children are not getting their needs met.^{7,9,16} In other studies as well aggression was not significantly associated with clinician observed aspects of communication,⁴ or any type of developmental language regression.¹⁷

Parent of children with ASD reported elevated prevalence of other-aggression behaviors and self-aggression compared to the observation of the clinician. Kanne and Mazurek report higher aggression behavior by parents with respect to direct observation.⁴ This result is probably due to the reduced observation time that the clinicians have compared to parents.

Furthermore, it appears that other-aggression behaviors toward parents and other people are closely related to each other, both in verbal and nonverbal children. The self-aggression behaviors in our sample are much less frequent than those other-aggression behaviors, especially during the clinical observation, probably due to context and limited time available. On the contrary, Rojahn et al found that self-injury was more frequent than hetero-aggressive children in various developmental disorder, but this study was based respondent-based behavior rating scales: the Behavior Problems Inventory.¹⁸

Our study shows that children with verbal communication deficits reported more aggression toward other people than verbal children without statistically significant differences. These data are reported by both parents and then confirmed by the psychiatrist during his observation.⁶ Since behavior is often a form of communication, many individuals with autism (as well as those without autism) voice their wants, needs, or concerns through behaviors rather than words.^{7,12} In any case in our study there is no statistically significant correlation between absence of verbal communication and aggression, as confirmed by the literature, at least according to the clinical observation,⁴ although it is reported that the lack of communication can be a risk factor.^{6,7}

Regarding other-aggression and self-aggression there is no statistically difference between HF and LF, although the parent report unpredictably showed a slight increase in both aggressions in HF, but clinician standardized observation evidence was contrary with more other-aggression and self-aggression in LF ASD children. According to our study, other authors found little correlation between aggression and IQ in patients diagnosed with ASD,⁴ suggesting that it is probably clinical severity of the individual case to determine the occurrence of aggressive behavior, rather than cognitive level, though the latter may worsen a clinical picture that is already compromised.¹⁹

On the other hand, in literature there are other studies that show that the clinical severity of patients with

mental retardation affects directly the emergence of aggressive behavior, mostly auto-aggressive.²⁰ Generally, individuals diagnosed with autism seem to be significantly more likely to show self-injury and aggressive behaviors, than those without autism, especially in the presence of communicative deficits.

Conclusion

In conclusion, this study highlights how the aggressive component is present especially in children with ASD. We have not found any association between aggressive behavior (other-aggression and self-aggression) and the absence of language or low IQ in children with ASD. Thus, the degree of severity of autism is probably the most important risk factor for this behavior.

Author Contributions

ADG: Contributed to conception and design; contributed to acquisition, analysis, or interpretation; critically revised the manuscript; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

FC: participated in the design of the study and performed the statistical analysis, critically revised the manuscript

VT: conceived of the study, and participated in its design and coordination and helped to draft the manuscript

AC: contributed to acquisition, drafted the manuscript

MGC: Contributed to acquisition, analysis, or interpretation; critically revised the manuscript

GP: Contributed to acquisition, analysis, or interpretation; critically revised the manuscript

Declaration of Conflicting Interests

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