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An Overview of Aggressive Behaviors in Children with Autism Spectrum Disorder

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A B S T R A C T

Children and adolescents with autism spectrum disorder (ASD) frequently exhibit symptoms of irritability and aggression, which may appear as tantrums, self-injury, and violent behaviors. As a result, parents often bring their children to the emergency room or seek psychiatric treatment. Aggression refers to conduct that poses a threat or inflicts injury by bodily or verbal actions, such as striking, biting, hurling things, or using offensive language against another individual. Aggressive behaviors can detrimentally impact the patient's quality of life, increase their stress levels, and hinder their ability to get educational and social assistance. A multidisciplinary approach is crucial for assessing patients and selecting the most effective treatment. Both non-pharmacologic and pharmacologic treatments are available to address violent behavior in children with ASD. As a health practitioner, it is crucial to understand the circumstances that might trigger aggressiveness in children with ASD and possess the knowledge and skills to effectively manage and treat these patients. By doing so, we can optimize their outcomes and enhance their overall quality of life.

1. Introduction

Autism spectrum disease (ASD) is classified as a neurodevelopmental disease characterized by difficulties in social communication, social relationships, and restricting, repetitive behavioral patterns.[1,2] In addition to these symptoms, children and adolescents with ASD frequently exhibit signs of irritability and aggression, which may manifest as tantrums, self-injury, and aggressive behaviors.[3] As a result, parents often bring their children to the emergency department or seek psychiatric consultation. Aggressiveness is defined as conduct that poses a threat or inflicts injury by bodily or verbal actions such as striking, biting, hurling things, or using offensive language against another individual. Patients may exhibit either a single aggressive behavior or many aggressive behaviors simultaneously, with varying durations, frequencies, and intensities.[4,5]

Aggressive behaviors can have a negative impact on the patient's quality of life, increase their stress levels, and hinder their ability to get educational and social support. Aggressive behaviors in children with ASD are also linked to residential placement, functional impairment, and the need for more extensive therapies. It can also contribute to heightened family stress, financial burden, and an increased need for caretakers. Additionally, it is associated with delinquency, conduct difficulties, emotional dysregulation, low peer acceptability, and peer rejection.[4]

The etiology of violent behavior in children with ASD is intricate and challenging to differentiate from other medical or psychiatric symptoms. The utilization of a multidisciplinary approach is crucial in

order to conduct a comprehensive evaluation and determine the optimal course of therapy for patients. As a health practitioner, it is crucial to be knowledgeable about the circumstances that might trigger aggressiveness in children with ASD and possess the skills to effectively manage and treat these patients.[5] By doing so, we can optimize their outcomes and enhance their overall quality of life. Therefore, we aim to conduct a comprehensive review on agressive behavior in children diagnosed with autism spectrum disorder.

Prevalence

An epidemiological study found that the average prevalence of ASD was 62 persons per 10,000 people.[6] The male-to-female ratio is around 4.5 to 1.2. The incidence of violent conduct is more pronounced in children with ASD compared to other developmental disabilities. Multiple studies have shown that children who have both intellectual disability (ID) and ASD exhibit hostility more frequently compared to those who just have ID.[7,8]

A previous study reported that 25% of children with ASD exhibit violent behavior difficulties. This conclusion significantly deviates from many studies that indicate a range above 50%. According to parent assessments on a specific item of the Autism Diagnostic Interview-Revised, aggressive behavior is present in 56% of children with ASD against their caregivers and in 32% towards non-caregivers. The findings of the research conducted utilizing the Autism Treatment Network (ATN) sample closely align with the proportion, resulting in a percentage of 53.7% based on parents' yes or no responses. The variations in the definitions of violent behaviors, diagnostic criteria for Autism Spectrum Disorder (ASD), and the lack of established assessment instruments in ASD populations pose challenges in comparing the findings of studies.[9]

Another study further examined the prevalence of agitation in individuals with ASD. During the study period, researchers discovered that 12.4% of ASD kids admitted to the pediatric medical ward experienced at least one recorded episode of agitation. In addition, agitation was also exhibited by 18.5% of the individuals in their sample who were hospitalized. The Child Behavior Checklist at an ASD clinic recorded aggressive behaviors in 25% of children, ranging from 2 to 16 years of age.[8]

Causes and factors that contribute to the development of a disease

Several circumstances, including mental health concerns, exposure to hazardous substances, central nervous system infections, and neurologic and metabolic diseases, contribute to aggressive behaviors in children. However, determining the origin and identifying the elements that contribute to violent behavior in children with autism spectrum disorder (ASD) is a challenging task due to the complexities of distinguishing ASD characteristics from other medical or psychiatric symptoms.[9,10]

The incidence of children with autism spectrum disorder (ASD) has risen in the past decade, and the cause of ASD is still a subject of contention among specialists. Medical conditions might potentially worsen violent behavior in children with ASD. Seven According to Hyman et al., behavioral outbursts can arise from stressful environmental events, as a response to a medical illness, or as a symptom that supports the diagnosis of a mental health issue. Functional challenges, such as difficulty in social communication, can lead to behavioral disruptions, which in turn might impact the patient's capacity to participate in educational and communal endeavors.[7]

Hill et al. concluded that sociodemographic characteristics, such as age, gender, parent education, race, and ethnicity, did not exhibit any correlation with violent behavior in children diagnosed with autism spectrum disorder (ASD).[7] Researchers found that aggressive conduct in children with ASD correlated with poorer cognitive functioning, increased use of psychotropic medicines and melatonin, reduced severity of ASD symptoms, and a higher prevalence of sleep, internalizing, and concentration issues. In addition, Howe et al. found that individuals with a prior history of agitation, sensory sensitivity, and previous psychiatric hospitalizations also experienced agitation.[9] Psychiatric comorbidity, intellectual

impairment, severe pain upon admission, or a DSM-IV ASD diagnosis in their study did not show any correlation with agitation in individuals with ASD.

It is crucial to identify the risk factors associated with aggressive behavior in children with autism spectrum disorder (ASD) during their medical hospitalization. Health practitioners who possess knowledge of the risk factors may effectively identify high-risk patients and mitigate their likelihood of engaging in violent behavior by providing various support services, including psychiatric consultation, occupational therapy, and tailored care plans. Health practitioners expect that these support services will enhance the quality and safety of inpatient medical treatment for children with ASD.[7,9]

The manifestation of symptoms

The Diagnostic and Statistical Manual of Mental Disorders, 5th edition, revised the diagnostic criteria for autism disorder compared to the DSM IV-TR.[3] This revision involved removing sub-diagnostic categories such as pervasive developmental disorder not otherwise specified, Asperger syndrome, and disintegrative disorder. Now, ASD encompasses both lower- and higher-functioning forms of autism. Experts have revised the diagnostic criteria for autism to include only two criteria: social communication or interaction and repetitive behaviors. This is a shift from the previous version, DSM IV-TR, which had three criteria: communicative intent, social reciprocity, and restricted or repetitive behaviors.[3]

Several symptoms often accompany ASD, including aggressive behaviors, irritability, hyperactivity, mood disturbances, sleeplessness, and anxiety. Many children with autism spectrum disorder (ASD) frequently employ disruptive behaviors as a means of expressing their dissatisfaction with their circumstances. Effective actions can become ingrained as recurring behavioral patterns. Approximately 40% to 50% of people diagnosed with autism spectrum disorder (ASD) exhibit self-injurious behaviors, particularly those who also experience sleep disturbances and aggressive behaviors. Hill et al. did a thorough study of the signs and symptoms of self-harming behavior in people with autism spectrum disorder (ASD), including the most likely co-occurring disorders and injuries that go along with them (Table 1).[7]

Treatment

Managing children who exhibit agitation and violence in the emergency room can be difficult, especially because it can lead to delays in screening and diagnosis. The main objective of treating agitation is to prevent any injury to patients, safeguard caregivers, and secure the safety of hospital workers. The therapy of children with ASD has several objectives. The objectives are to reduce primary impairments such as social communication and restricted or repetitive behaviors, enhance functional autonomy, and decrease, eradicate, or preempt maladaptive behaviors. A multimodal treatment strategy, which includes speech therapy, occupational and physical therapy, behavior management, medicines for concurrent diseases, and specific educational assistance, addresses the primary symptoms of ASD.[11,12]

Table 1. Clinical presentations of self-injurious behavior.

Type of self-injury	Potential associated conditions	Potential associated injury
Head slapping or hitting	Headache, ear infection, sinus infection, toothache	Contusions, fracture of bones in hand, abrasions, detached retina
Head banging	Headache, ear infection, sinus infection, toothache	Contusions, abrasions, detached retina
Gum or tooth banging or digging	Gingivitis, dental pain	Tooth autoextraction, gum injury, tooth fracture
Eye poking	Eye pain, vision loss	Eye abrasion
Finger and toenail picking or biting	Pain	Nail removal, paronychia, infection, ingrown nails
Stomping or kicking	Leg pain, restless leg syndrome	Fractures, bruises
Rumination	Eosinophilic esophagitis, gastroesophageal reflux	Dental damage, esophageal ulceration and bleeding, precancerous lesions of esophagus, nutritional compromise
Scratching and skin picking	Eczema, skin infection or infestation, allergy	Scarring, infection

Non-pharmacological treatment is the initial therapy option. Acquiring knowledge of behavior principles can assist health practitioners in effectively implementing behavioral interventions to address violence in individuals with autism spectrum disorder (ASD). The suggested behavioral treatment is termed applied behavior analysis (ABA). ABA is a therapeutic approach that utilizes the principles of learning and operant conditioning. It involves targeting particular interventions and using positive reinforcement, such as verbal praise, tokens, or culinary rewards. The repetition of learning trials is a crucial element of this treatment. Early implementation of rigorous Applied Behavior Analysis (ABA) can significantly enhance the cognitive abilities of children with autism spectrum disorder (ASD), resulting in a notable boost in their IQ scores and facilitating their successful integration into mainstream educational settings.[10]

Fitzpatrick et al. identified three non-pharmacological interventions for addressing aggressiveness in individuals with autism spectrum disorder (ASD): (1) functional behavior assessment (FBA), (2) reinforcement techniques, and (3) functional communication training (FCT). Functional conduct assessment (FBA) is the systematic gathering of data to identify the specific consequences that reinforce an individual's conduct.[1] The instances of favorable outcomes that are likely to sustain activity include the availability of favored activities or items, social recognition, access to sensory stimulation, and the elimination of demands or other unpleasant stimuli. One can employ various reinforcement strategies, such as reinforcing behavior that occurs in the absence of problem behavior, reinforcing behavior that is incompatible with aggressive behavior, or reinforcing appropriate behavior that serves the same functional purpose as the aggression. Functional communication training (FCT) is a method that focuses on teaching individuals how to effectively ask for something they want in order to decrease unwanted behaviors. This might include requesting social attention, desired objects or activities, or seeking to avoid engaging in undesirable tasks.[2,4]

If training-based treatments are unsuccessful or impractical, pharmacotherapy can be used. The US Food and Drug Administration has only authorized the use of risperidone and aripiprazole as medications for managing irritability and agitation in children

diagnosed with autism spectrum disorder (ASD). The American Psychiatric Association has declared that risperidone and aripiprazole are classified as atypical antipsychotic medicines and should not be used as first-line therapy without thorough assessment and supervision.[13,14]

The Therapeutic Goods Administration in Australia approves risperidone as a therapy for irritability and hostility in patients under 18 years old with autism. However, the use of this prescription might result in many negative effects, including increased body weight, higher levels of blood glucose, lipids, and prolactin, as well as disruptions in the normal progression of puberty.[13] In the United States, aripiprazole is a favored drug because of its lower incidence of adverse effects related to weight gain or prolactin levels, while it does not possess a stronger sedative effect compared to risperidone.[14] Health practitioners must be aware of the children's weight, height, onset of menstruation, menstrual cycle, blood glucose levels, fasting lipids, and prolactin levels. Health practitioners must monitor the children's weight, height, onset of menstruation, menstrual cycle, blood glucose levels, fasting lipids, and prolactin levels after one month, and then every six months. If there is a rise in prolactin levels or the occurrence of aberrant muscular movements, it is necessary to decrease the dosage of the medicine and reevaluate its usage. The table below provides a description of the dosage, indications, and adverse effects of risperidone and aripiprazole.

Table 2. Aggressive behavior in children with ASD drug of choices.

Drug	Age, weight	Dosage	Indication	Side effects
Risperidone	>5 years old, < 20 kg	0,25mg, once daily for 3 days, then increase to 0,5 mg daily. If necessary, increase by 0,25mg every 2 weeks. Usual range 0,5-1,5 mg daily.	Autism spectrum disorder, best for agitation, aggression and impulsivity.	Weight gain, increased appetite.
	>5 years old, >20 kg	0,5 mg once daily for 3 days, then increase to 1 mg daily. If necessary, increase daily dose by 0,5 mg every 2 weeks. Usual range 1 -2,5 mg daily, maximum 3 mg daily.		
Aripiprazole	6-8 years old	2,5 mg once daily for 1 week, then 5 mg once daily. If necessary, increase daily dose in 5 mg increments at intervals of at least a week, to a maximum of 15 mg once daily.	Agitation, irritability.	Less weight gain than risperidone, but little sedation and can be an activating drug.

2. Conclusion

Various clinical presentations might aid a healthcare professional in making a diagnosis and determining any linked diseases and injuries. Non-pharmacological therapy, including functional behavior assessment, reinforcement techniques, and functional communication training, is the primary approach for addressing aggressive behavior in children with ASD. If training-based interventions are unsuccessful or impracticable, pharmacotherapy can be utilized. Risperidone and aripiprazole have been approved by the US FDA as medications for treating irritability and agitation in children with autism spectrum disorder.

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