Case Series

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Youth Violent Offenders with Autism Spectrum Disorder.

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ABSTRACT

Adolescents and young adults with autism spectrum disorder often face interpersonal and learning challenges that are poorly understood by the public. Understanding how these individuals lose control to the point of engaging in violence and crafting effective interventions require further exploration of the medical and criminal justice systems. Investigating several challenging cases, we illustrate commonalities among the young offenders, including comorbidities, addictive behaviors, family histories, and adverse childhood experiences. All these reviewed cases have undergone medical assessment, with some incarcerated and others remaining free.

Keywords: incarceration, addiction, autism spectrum disorder, offenders, young people.

INTRODUCTION

Autism spectrum disorder (ASD), per the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (American Psychiatric Association, 2013), is primarily characterized by poor social and emotional reciprocity, impairment in nonverbal communication and social interactions, and repetitive and restricted behavioral patterns or interests beginning in early development. Links between ASD and violent behavior are controversial for various reasons, including psychiatric comorbidity, challenges in interpreting social cues or rigid thought patterns, and exposure to unfriendly environments and mistreatment (Del Pozzo et al., 2018; Im, 2016b; Mouridsen, 2012).

Psychiatric comorbidity among criminal offenders with ASD is estimated to be 78.9% (van Buitenen et al., 2021), including schizophrenia spectrum disorders (31.7%) and substance use disorders (39.8%). Over 50% of patients with ASD have a comorbid diagnosis of attention-deficit/hyperactivity disorder (ADHD) (Lee and Ousley, 2006), and >70% exhibit intellectual disability (Buck et al., 2014). Both are linked to aggression in incarcerated populations (Fazel et al., 2008; Retz et al., 2004).

Individuals with ASD may misinterpret nonverbal cues and have impaired abstract thinking and time sequencing (Wing, 1981). A small proportion of ASD individuals may develop circumscribed interests in violence-related materials, potentially leading to violent threats toward others owing to misattributed personal frustrations (Allely et al., 2017).

Patients with ASD often have a naïve and limited understanding of interpersonal relationships, leading to progressive social isolation and feelings of loneliness. Some may attempt to develop close relationships in misguided ways (Murrie et al., 2002), and they are at a higher risk of being bullied (Cappadocia et al., 2012). American household survey studies show that youth with ASD tend to experience adverse childhood experiences (ACEs), often attributed to co-occurring behavioral and emotional disturbances (Kerns and Lee, 2015). ACEs in individuals with ASD may be associated with violent behaviors (Allely et al., 2017).

In East Asian countries, despite increasing public awareness of ASD, there is little understanding of intermittent aggression in ASD and rare clinical analytical reports on the risk factors associated with criminal offenders with ASD. We present five

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cases of criminal offenders with ASD who received medical evaluations drawn from facility medical records.

Case 1: The Bullied One

AB, a 15-year-old ninth-grade student with a stubborn and self-centered personality, lived with his parents and younger sister. His pregnancy had been without incident, and he was relatively easy to care for in infancy, showing no motor or language delays.

During childhood, AB exhibited some inattention and had low motivation and poor achievement in Chinese and English, although he excelled in mathematics and science. He was diagnosed with ADHD, but his family chose to allow him to learn naturally. Around 9 to 10 years old, he began displaying symptoms of eye blinking and shoulder–neck twitching, particularly during anxiety and fatigue. At 12, he experienced persistent hiccupping and was diagnosed with Tourette's syndrome. He was aware of his impending tics or vocalizations and suppressed them without medication.

After receiving a smartphone at 13 years old, AB spent much time playing violent video games, resisting parental restrictions. He often played until 2 or 3 am on school nights, and his academic performance suffered. His parents sometimes confiscated his phone, but he then took theirs without permission to play games until morning, often borrowing his mother's phone for "school needs" and refusing to return it. This led to verbal and physical conflict. His father's reprimands and physical punishment alienated AB from him and strained AB's relationship with his mother.

Since adolescence, as AB recalled and his mother and teachers observed, AB had few friends and no close ones. He sometimes stood so close while talking that others could feel his breath, and he unintentionally offended others with his comments and irrelevant videos or disturbed them with repetitive, bizarre movements in class, without understanding others' nonverbal expressions of harassment. AB was socially excluded at school, and classmates often taunted him, nicknaming him "Wuhan pneumonia" or a "spy."

The family noticed AB's obvious difficulty communicating with others and progressively greater stubbornness and argumentativeness, resulting in disproportionate anger. For example, he locked his mother out of the house for not helping him with eye drops, slept on his mother's bedroom floor to protest her perceived favoritism toward his younger sister, and refused to accept others' cautions regarding his inappropriate actions.

At home, AB often showed irritability, destroying family furnishings, accusing his parents of various shortcomings, slamming doors, throwing objects, and even beginning physical altercations with his parents. The neighbors often knocked on the door or called the police to complain. His mother also began calling the police after AB reached 14, reporting domestic violence and applying for a protective order (the court ultimately rejected this). The juvenile court required AB to meet regularly with a juvenile protection officer, who suggested that his parents take him to a child and adolescent psychiatrist.

At initial evaluation, AB had difficulty describing organized sequences of events. AB's above-average intelligence was observed, along with his relatively poor attention, learning, and coping skills. AB presented one-sided interpersonal interaction in conversations, with poor emotional and social reciprocity, restricted activity patterns, and problematic internet usage. Projective and self-report data indicated his subjective need for achievement, fairness, and winning, together with a low self-concept. He disliked himself, felt rejected, perceived unfair treatment of him, and tended to respond in a pedantic, self-centered manner, using sarcastic and impolite comments and reacting from personal likes and feelings. When his needs went unmet, he felt troubled, disappointed, and guilty.

Receiving diagnoses of ASD and ADHD, AB began receive weekly individualized psychiatric interventions, including cognitive behavioral therapy (CBT) and solution-brief focused therapy (SFBT), mainly focusing on his anger toward his condition, family problems, and hatred of his father. Months later, AB built an alliance with his mother and sister to overcome his deficits in social interactions. However, he still spent much time playing online games. His father continued to punish him physically for playing too much or too late. One day, he hit his father's head with a hammer during a fight. The father was sent to a surgeon, and AB was recommended for hospitalization by the therapeutic teams. AB's school allowed him to continue adjusted studying from the hospital. He was prescribed antipsychotic agents and psychostimulants for his irritability, impulsivity, and inattention. The core problems of his double diagnosis were introduced to AB, his family, and his teacher. Disability and catastrophic illness cards were applied for, and special education with counseling was introduced to his campus.

At 16 years old, after discharge, AB continued to receive individual therapy and began group therapy, including Program for the Education and Enrichment of Relational Skills (PEERS) and Dialectical Behavior Therapy (DBT) to promote emotional recognition, social skills, tolerance of frustration, and problem-solving skills. The teacher and AB brought paper notes, online records, and even videos related to conflicts into therapeutic sessions to verify the underlying social cues and refine social strategies for interacting with others. We accompanied AB to his school and in his surrounding community to have him observe facial expressions, movements, and behaviors on passersby; these were adopted as materials for his role-play tasks in social skills training programs.

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Two years after AB's violence against his father, who tended to arrive home after AB fell asleep and leave early in the morning, the family successfully had dinner outside, with no verbal conflict. AB watched videos online on his cell phone and spoke as little as possible during the meal. When he encountered a novel problem, AB returned to our clinic for help earlier than appointed. His mother and teacher called our therapeutic team in case of stressful events.

Case 2: Dual Disability

CD, a 21-year-old, unmarried, unemployed man with a vocational high school education and no history of epilepsy or substance use. Born after a 38-week gestation, he was diagnosed with ventriculomegaly and was under pediatric neurology follow-up. His developmental milestones were delayed. At 7–8 months, he could not sit steadily and was diagnosed with spina bifida. Following early intervention and rehabilitation, he gained the ability to stand and walk steadily. He did not produce sounds until around 2 years old, but after speech therapy, he formed sentences before turning 3.

In childhood, CD exhibited limited eye contact, significant emotional fluctuations, and restricted types of peer play. He had few friends, was strongly interested in history, and enjoyed enacting scenes from martial arts stories. He struggled to understand implicit meanings in conversations, stories, comics, and movies; although he could express his own thoughts, he could not maintain back-and-forth communication. His obstinate nature and difficulty in adapting to different situations often led to emotional outbursts, impulsivity, conflicts with classmates, and trouble sitting still.

In adolescence, CD began displaying anxiety symptoms. Life events in middle and high school, including transferring schools, poor academic performance, and unsuccessful intimate relationships with female peers, led to environmental and interpersonal adaptation challenges. Between 19 and 20, he often felt emotionally low and irritable, exhibiting disordered sleep and appetite and poor emotional coping skills, manifested in jumping from heights, putting plastic bags over his head, and wrist cutting. He relieved stress through heavy drinking, consuming over 20 standard drinks every 2–3 days, leading to physical tolerance. When intoxicated, he experienced memory blackouts, psychomotor agitation, increased heart rate, and perceptual distortions, including hearing his mother scolding him before sleeping, although he recognized this was not real. These perceptions disappeared after waking. His drinking and hangovers significantly impacted his school attendance, academic performance, and social interactions. He found it difficult to reduce his drinking and had little motivation to do so. CD's behavior was impulsive and showed low self-efficacy. His interpersonal relationships were influenced by extreme values, often guarded and inconsistent. He struggled to empathize and express regret, and he had difficulty coping with long-term anxiety and emptiness. Under extreme stress, he experienced transient perceptual distortions. His actions included animal cruelty, verbal and physical altercations, and domestic violence, which he often rationalized and attributed to others. He was briefly hospitalized for attempted violence toward his family but refused any medication or intervention after discharge.

In psychological assessments, CD appeared defensive and suspicious. Final reports indicated low-average intelligence, with poor perceptual reasoning and processing speed but above-average verbal comprehension. Personality assessment revealed passive-aggressiveness and borderline and antisocial traits, along with unstable emotions, persistent depressed mood, long-term anger, and poor self-awareness. Upon interpersonal frustration, he tended to devalue, blame, or attack others, showing a negative self-concept and a poorly integrated sense of self. In social story exploration, CD expressed himself in a brief, undetailed manner with extreme values and struggled to recognize emotions in characters, indicating primitive and immature emotional differentiation.

At 21, CD had an argument with his parents after they tried to stop him following a woman with disturbing behavior. He attacked a passerby with a knife, causing severe bleeding. He was sent to the emergency room for psychiatric evaluation and hospitalization. At first, he claimed he wanted to take revenge on his parents, but later, he said he could not remember anything related to the assault, saying, "the evil made me do it." No psychotic or manic symptoms were noted, but emotional disturbances and maladaptation were evident. The court ultimately placed him on probation. CD again refused any medical follow-up or intervention.

Case 3: A Burnout Family with Three Patients

EF, a 14-year-old male, has a mother with bipolar I disorder and a brother with ADHD. His mother experienced no prenatal or perinatal complications, and EF showed no delays in motor skills or self-care. However, around 3 years old, he began to exhibit persistent deficits in social communication and interaction. This included a lack of social-emotional reciprocity, manifested as difficulty engaging in back-and-forth conversation, sharing interests, and expressing emotions, along with limited nonverbal communicative behavior, with poor eye contact and struggling to understand social cues or gestures. In elementary and junior high school, EF had few friends and was occasionally excluded or manipulated by peers. He demonstrated restricted, repetitive behaviors and interests, with stereotyped use of objects (like lining up toys), difficulty with transitions, and an excessive fascination with samurai items, tattoos, and graffiti. In addition, EF exhibited unusual tactile sensitivity, requiring notification before being

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touched and preferring collarless clothing.

During elementary school, EF clearly exhibited hyperactivity, inattention, irritability, argumentativeness, defiance, and vindictiveness. Entering adolescence, he exhibited physical aggression, deceitfulness, property destruction, serious rule violations, and truancy. His lack of remorse and empathy made it difficult for his parents, counselors, social workers, and probation officers to implement effective behavioral modification. While his mother regularly sought medication refills for herself, EF consistently refused to take medication.

At age 13, EF was incarcerated for 2 months for assault, domestic violence, and sexual assault. In prison, he frequently clashed with officers and other inmates, leading to a head injury and brief loss of consciousness. He refused all medication in prison. After release, EF continued to associate with gang members, showing low self-esteem and self-efficacy and engaging in problematic behaviors driven by impulsivity and the rigid belief that he could gain acceptance from delinquent peers by following their behaviors of getting tattoos, smoking, drinking alcohol, and using psychoactive substances. His lifestyle became chaotic. He frequently asked his parents for alcohol and cigarette money, and he attempted to tattoo himself. His parents' interventions were met with violence. EF was admitted to a psychiatric emergency unit and hospitalized for four months in a single room with a structured schedule including handmade job training and basic courses in Chinese and mathematics, reflecting his limited foundational knowledge. During hospitalization, he received medication, CBT, and SFBT.

Psychological assessment indicated borderline intellectual disability, poor recognition of facial expressions, limited understanding of social narratives in interpersonal cues or metaphors, and underdeveloped language skills. EF eventually cooperated with the medical team to enhance his knowledge and receive antipsychotics and psychostimulants for his irritability, impulsivity, and inattention. He showed moderate improvement in the acute ward. However, after discharge, he struggled to control himself, often leaving home at midnight to join delinquents, refusing to return to his special education facility during the day, instead spending time with peers involved in fraud. Following discussion with EF, his parents, and the medical team, the court placed him in a reformatory for intensive special education with structured living arrangements and ongoing medical intervention.

Case 4: Force of Inflexibility

GH is a 14-year-old male and a second-year junior high school student with a history of ADHD who received irregular treatment at a local clinic since he was 9. There was no prenatal substance exposure or complications. No perinatal diseases or neurological deficits were observed, and the patient's motor, speech and self-care development was typical. He was primarily raised by his parents, who had no history of criminal behavior, substance use, or mental illness. GH had no brain trauma, seizures, substance exposure, or sexual activity. During kindergarten, no significant social problems or restricted or repetitive patterns were noted.

Beginning in elementary school, particularly in grades 3 and 4 and continuing into junior high, GH exhibited increasingly severe social-emotional reciprocity problems. These manifested as shouting, self-hitting, head-knocking, and unprovoked attacks on others, coupled with an inflexibility toward changes in external or environmental conditions. He struggled with verbal and nonverbal communication in advanced interactions. Under stress, he used idiosyncratic language and vocalizations, including howling. He found it challenging to adapt to different social contexts. For instance, he refused to take tests if he perceived them to be late or refused to attend school if a new teacher's teaching style differed from the previous teacher's. GH experienced abnormal pain reactions and evident hyperphagia.

From 8 to 9 years old, GH showed consistent inattention, hyperactivity, and impulsivity. His father responded by punishing him at school and home to correct his behavior. A teacher reported suspected domestic violence to the social welfare system, leading to the father's receiving parenting education. From then, GH has been increasingly resentful, vindictive, and sensitive. His bullying, theft, truancy, and deceitful behavior to obtain goods worsened despite psychological intervention.

Within a year of turning 13, GH was incarcerated twice for multiple thefts. While in detention, he consistently exhibited irritability, aggression, and violent threats. Despite daily hour-long interviews by correctional staff, his emotional disturbance persisted. Inmate's and staff's attempt on one occasion to calm his shouting and lying on the ground resulted in physical attacks by GH. He was taken to a psychiatric emergency unit for consultation. The medical team, coordinating with correctional staff, parents, teachers, probation officers, investigators, and the court, compiled the patient's history. After 5 days of hospital interviews using SFBT, GH agreed to take medication, and he was transferred to a reformatory for special education. He expressed the desire not to return home, feeling that his parents could not meet his needs.

Case 5: Far from Home

IJ, a 24-year-old woman with a history of ASD from childhood, had poor social-emotional reciprocity and lacked nonverbal communication skills. Her stubbornness, inflexibility, and hypersensitivity to external stimuli caused distress for her and her family. Since childhood, she exhibited fantasies and patterns of pseudologia fantastica, unconsciously captivating

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others with fabricated stories, portraying herself as an orphan or as adopted with complex abuse or sexual abuse from various families or countries. These fabrications led to investigation of her parents, who were blamed for IJ's maladaptive behaviors and inconsistent speech, contributing to her parents' divorce. IJ primarily lived with her father.

In late adolescence, IJ began experiencing delusional atmosphere, moods, referential and persecutory delusions, and auditory and visual hallucinations. Her behavior became increasingly disorganized; she would shout, gesture while talking to herself, and escape from her home, wandering hundreds of miles away after stealing money from her family.

Despite her family's attempts to seek help and even commit her to an acute psychiatric ward under a diagnosis of ASD and schizophrenia, her rigid thinking, thought disorder, poor reality testing, and vindictiveness led her to accuse her family and others of infringing on her liberty or assaulting her.

After discharge, IJ refused all medication and intervention. She moved from town to town, living without fixed residence or employment. She frequently argued with strangers or assaulted passersby and police officers with knives hidden in her backpacks, influenced by her persistent persecutory delusions. Her self-care deteriorated: she rarely showered and ate irregularly. Authorities had difficulty tracking her. During hospitalizations, her threats and verbal assaults often led to early discharge. Compulsory admission was attempted, but her response to antipsychotic medication was poor, and she struggled with the side effects of sedation and akathisia. Following compulsory admission, IJ disappeared and did not return for medication refills. Her lack of cooperation extended to psychological assessment and imaging, making it difficult to identify cognitive or personality changes.

Table 1. Comparison among five subjects with autism spectrum disorder (ASD)

	Case 1	Case 2	Case 3	Case 4	Case 5
Age	15	21	14	14	24
Sex	Male	Male	Male	Male	Female
Diagnosis	ASD ADHD	ASD ADHD Depressive disorder	ASD ADHD	ASD ADHD	ASD Schizophrenia
Family history	No	Mood disorder AUD	Bipolar I disorder ADHD	Mood disorder	Mood disorder
Addictive behaviors	Internet gaming	Alcohol	Internet gaming Cigarette Alcohol Drug-laced coffee bags	No	No
Intelligence	Above average	Below average	Borderline ID	Below average	Unknown
Adverse experiences	School bullying	School bullying Domestic violence	School bullying Domestic violence	Domestic violence	Domestic violence Parental divorce
Violence attempts	To family	To family,strangers	To family	To peers, teachers, correctional staff	To strangers, police officers, medical staff
Suicide attempts	No	Jumping from the building, wrist cutting, and suffocation	No	head knocking on the wall	No
Criminal behaviors	Domestic violence	Domestic violence Severe assaults	Domestic violence Sexual assault Assault	Repetitive thefts	Severe assault
Psychiatric emergency visit	Two times	More than five times	Five times	Once	More than five times
Psychiatric hospitalization	Two times	More than five times	Three times	Once	More than five times

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Pharmacological interventions	Antipsychotics Psychostimulant	Antipsychotics Hyposedative Mood stabilizer	Antipsychotics Psychostimulant	Antipsychotics Psychostimulant	Antipsychotics Hyposedative Mood stabilizer
Nonpharmacological interventions	CBT SFBT DBT PEERS Special education	No	CBT Special education Reformatory referral	CBT Special education Reformatory referral	No
Compliance	Fair	Lost to follow-up	Fair	Fair	Lost to follow-up

ADHD, attention-deficit/hyperactivity disorder; ID, intellectual disability; CBT, Cognitive Behavioral Therapy; SFBT, Solution-focused Brief Therapy; DBT, Dialectical Behavior Therapy; PEERS, Program for the Education and Enrichment of Relational Skills

DISCUSSION

The study examined five criminals diagnosed with ASD (Table 1). All had additional psychiatric diagnoses, experience with psychiatric emergency services, psychiatric hospitalizations, and treatment with antipsychotic medications. Each also had ACEs. Four had comorbid ADHD, three exhibited addictive behaviors, and two attempted suicide. The two adult cases of attacking strangers demonstrated poor treatment compliance. The two adolescent cases received regular treatment and special education through the juvenile reform system.

The global prevalence of ASD is approximately 1% (Lyall et al., 2017), with an estimated rate of 1.0–1.2% in Taiwan (Chen et al., 2015; Hsu et al., 2012). Approximately 70% of ASD individuals have at least one comorbidity. ASD etiology is multifactorial, involving genetics, infections, immune systems, exposure to substances, and environmental factors, all of which can affect neurophysiological development, structure, and connections (Sauer et al., 2021). Approximately 48% of ASD children receive psychiatric medications, compared with approximately 7% of non-ASD children. Approximately 30% are treated with psychostimulants for hyperactivity and inattention, and 20% with antipsychotics for irritability (Madden et al., 2017). Medication adherence in ASD may be below 50%, related to the individual's symptoms and multiple medications (Logan et al., 2014). Compliance with behavioral interventions for ASD patients and their caregivers is also low, associated with caregiver's stress and understanding of ASD and with the presence of multiple comorbidities (Carr et al., 2015; Croen et al., 2017). Relative to adolescents with only ADHD or no psychiatric diagnosis, ASD adolescents have significantly higher rates of psychiatric emergency department visits and acute ward hospitalizations (Kalb et al., 2019).

Individuals with ASD may be profoundly affected by ACEs, including bullying, low family income, parental divorce or separation, caregiver death, caregiver incarceration, witnessing parental violence, experiencing or witnessing community violence, living with someone with a mental illness, living with someone with severe depressive symptoms and suicidal ideation, living with a substance user, and discrimination due to racial or cultural factors (Allen et al., 2008; Hoover and Kaufman, 2018).
ASD individuals are three or more times more likely to be bullied during their schooling years than typically developing peers (Maïano et al., 2016) and more than twice as likely to experience abuse and neglect (McDonnell et al., 2019). These negative experiences and their potential bidirectional relationship to ASD's vulnerabilities pose significant challenges (Kerns et al., 2017). Approximately 63% of individuals with ASD have language impairment, and approximately 15% experience sensory perception abnormalities (Levy et al., 2010). These impairments affect their ability to recognize facial expressions, understand speech, integrate communication content, express emotions, and react to environmental stimuli (Happé and Frith, 2006; Miller et al., 2008; Perkins et al., 2010; Ramachandran and Oberman, 2006; Siponmaa et al., 2001; Young et al., 2020). The development of the ability to infer intentions, emotions, and behaviors is also different in ASD individuals (Burnside et al., 2017), leading to socially naive behaviors, misjudgment of consequences, and distorted interpersonal relationships (Orsmond et al., 2004). Life stressors, including social confusion, isolation, fear of making mistakes, and idiosyncratic sensory experiences can exacerbate anxiety in ASD individuals, leading to more maladaptive behaviors and restricted or repetitive behaviors, along with emotional and behavioral problems (Wood and Gadow, 2010). Difficulties in environmental adaptation, emotional regulation, quality

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of life, functional living, and interpersonal relationships (Fitzpatrick et al., 2016) may increase depressive symptoms, suicide attempts (Shtayermman and Fletcher, 2022), and the risk of violence (DelPozzo et al., 2018). The challenges faced by ASD individuals can lead to increased stress, psychological distress, relationship problems, and difficulties for caregivers (Chan and Leung, 2020; Hickey et al., 2020; Schnabel et al., 2020; Walton and Tiede, 2020), potentially exacerbating burnout (Kütük et al., 2021) and increasing the risk of maltreatment.

ADHD is a neurodevelopmental disorder in which individuals may exhibit significant inattention, hyperactivity, and impulsivity before the age 12, affecting learning, interpersonal interactions, and behavior (American Psychiatric Association, 2013). ADHD has over 70% heritability, with non-genetic causes including prenatal exposure to smoking or alcohol, prenatal infections, complications during pregnancy or childbirth, and environmental factors (Thapar et al., 2012). The prevalence of ADHD is approximately 6% (Liu et al., 2018), and approximately 40% of individuals with ADHD experience inattention and organizational difficulties in adulthood. Nearly half of ADHD patients are diagnosed with personality disorders, and nearly 30% have antisocial personality disorder. This population has a higher likelihood of substance use and arrest (Mannuzza and Klein, 2000; Miller et al., 2008). ASD and ADHD have an approximate comorbidity rate of 25–65% (Hedley and Uljarević, 2018; Lai et al., 2019; Lugo-Marín et al., 2019), with approximately 40% in Taiwan (Chen et al., 2015). Patients with comorbid ASD and ADHD are more than twice as likely to have addiction problems than those without either condition (Butwicka et al., 2017). Clinical symptoms common to ASD and ADHD include rigidity, poor attention, idiosyncratic sensory responses, and difficulty predicting behavioral consequences (Lau-Zhu et al., 2019; Nijmeijer et al., 2009; Reiersen et al., 2007). Comorbid ASD and ADHD patients have worse dispersed attention, alertness, anxiety levels, working memory, empathy, and social interaction than those with only one condition (Colombi and Ghaziuddin, 2017; Kotte et al., 2013; Sinzig et al., 2008). Psychostimulants are the primary treatment for ASD cases with comorbid ADHD (Young et al., 2020). While the their effectiveness can reach 70–80% in ADHD-only patients (The MTA Cooperative Group, 1999), it is less than 50% in comorbid ASD and ADHD, with a 20% discontinuation rate due to side effects (Research Units on Pediatric Psychopharmacology (RUPP) Autism Network., 2005). Pivotal response treatment is an important non-pharmacological intervention (Lei and Ventola, 2017). A treatment team can collaborate with patients, caregivers, and educational institutions to establish treatment goals, including improving focus, enhancing emotional self-regulation, using natural reinforcers day-to-day, varying task difficulty, and selectively changing learning topics according to patient need. Schizophrenia's core symptoms include delusions, hallucinations, disorganized speech or behavior, negative symptoms, and a decline in multiple functions, with patients experiencing symptom interference for over six months (American Psychiatric Association, 2013). Schizophrenia has a multifaceted etiology, involving genetic and environmental factors, neurodevelopment, complications during pregnancy, substance exposure, migration, and stressful events (Harrison and Weinberger, 2005; McClellan et al., 2006; McClellan and Stock, 2013). Structural abnormalities in the brains of patients with schizophrenia include reduced frontal lobe and cerebral cortex volumes and anomalies in the limbic system, affecting impulse control, cognition, and emotional regulation (Janssen et al., 2008; McGrath and Susser, 2009; Penttilä et al., 2008; Thompson et al., 2001; White et al., 2008). ACEs and other stressful events can impact neurophysiology, leading to decreased cortical volume, limbic system alterations, dendritic density, myelination, axonal signal transmission, and reduced neuroplasticity, potentially further affecting positive and symptoms and cognitive decline (Damsted et al., 2011). Individuals with ASD are three times more likely to develop schizophrenia in late adolescence (Zheng et al., 2018). The clinical similarities between ASD and schizophrenia include restricted effect, decreased motivation, and difficulties in social communication (Gadow, 2013; Sheitman et al., 2004). Neuropsychological assessments also indicate poorer emotional recognition, processing speed (Eack et al., 2013), and executive function (Demetriou et al., 2018; Dibben et al., 2009) in both ASD and schizophrenia. Treatment for adolescents with schizophrenia predominantly involves antipsychotics (Kahn et al., 2008; McClellan and Stock, 2013), and discontinuing them significantly increases the risk of symptom relapse and is not recommended (Schwartz et al., 2000). Patients with ASD and schizophrenia respond less well to antipsychotics than those with schizophrenia alone, with more refractory symptoms; approximately 30% of patients experience intolerable side effects from antipsychotics (Downs et al., 2017). Non-pharmacological treatments are also important. CBT, family intervention, social skills training, cognitive restructuring, social connections, and problem-solving interventions can enhance illness awareness, treatment compliance, relapse prevention, and educational and training outcomes (Bechdolf et al., 2012; Eack et al., 2009; Petersen et al., 2005).

In UK forensic psychiatric wards, the proportion of cases with ASD is higher than that in the general population, exceeding 2% (Hare and Gould, 2019; Scragg and Shah, 1994). In Sweden, more than 10% of adolescent and young adult criminal offenders may have ASD (Siponmaa et al., 2001). Small-scale statistical data and case reports are found regarding violent

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crimes, sexual offenses (Allen et al., 2008), arson (Mouridsen et al., 2008), and substance-related crimes (Murphy, 2003; Schwartz-Watts, 2005) in ASD. A large-scale literature review indicates that ASD alone does not increase the likelihood of violent or criminal behavior (Im, 2016a). Other factors may influence such behaviors, including psychiatric comorbidities (Mouridsen, 2012), low educational attainment, truancy, impulsivity, insufficient social networks, late diagnosis (Dein and Woodbury-Smith, 2010), and ACEs (Im, 2016b). Most ASD individuals adhere to legal norms, and only a minority engage in criminality. Possible motives for this behavior include obsession with dangerous objects; retaliation for negative experiences, either against the perpetrator or displaced; hostility toward caregivers due to unmet needs; outbursts due to hypersensitivity to environmental stimuli; coercion into criminal activity by trusted or influential individuals; and engaging in violent behavior to draw attention to seek help (Wing, 1997).

There are currently no clear guidelines for the care or management of ASD in prisons. It is routinely recommended to use the Autism Spectrum Disorder in Adults Screening Questionnaire (ASDASQ) (Nylander and Gillberg, 2001) to screen for cases. The ASDASQ questionnaire consists of 10 yes-or-no questions, completed by an observer from the individual's medical history, interpersonal interactions, communication quality, rigid thinking patterns, peculiar behaviors, and self-care. If there are more than 6 "yes" responses, referral to mental health professionals is advised. Their professional assessment often requires objective information, including observations by caregivers and teachers from the individual's childhood, to understand the life history or the psychopathology behind problematic behaviors.

After diagnosis and confirmation of comorbidities, ASD individuals should receive targeted treatment, including pharmacological and nonpharmacological interventions. It is also important to reduce environmental stimuli to a level that patient can tolerate. Informing the patient before any potential changes (Berney, 2007; Dein and Woodbury-Smith, 2010), including adjustments to daily routines or moving to a different cell or correctional facility, can help reduce anxiety and impulsive behaviors that may arise from unfamiliarity in a new environment. In addition, if an individual has significant social-interaction deficits or learning difficulties, educational resources should be considered (Woodbury-Smith et al., 2006). These approaches can help ASD individuals perform better in restrictive environments, reducing the likelihood of exploitation, bullying, and difficulty obtaining parole (Hare and Gould, 2019; Wing, 1997; Woodbury-Smith et al., 2006).

Evidently, ASD symptoms alone are insufficient to explain the criminal behavior of these cases. Symptoms of other comorbidities, learning challenges, social learning behaviors, personality traits, low self-control, and inadequate social bonds may be more crucial for their motives and for prevention. The three adolescent cases that underwent structured interventions exhibited notable improvements. However, the two adult cases, characterized by violence toward strangers, were not successfully followed up. It is clearly necessary to enhance integrated cross-network interventions.

The rate of individuals with ASD in the criminal justice system remains unknown. The impact of their disabilities on criminal responsibility, competence to stand trial, and ability to testify has not been adequately discussed, and appropriate intervention strategies remain undeveloped. To assist individuals with ASD reduce recidivism and integrate into society, collaborative cross-network efforts between neuropsychiatric experts and criminal justice professionals are needed.

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