



Interprofessional Practice for the Treatment of Intellectual Disability

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Holistic healthcare and interprofessional practice are the current trends for patient care. However, few case reports have detailed the clinical care of patients with multiple issues. This case report presents the interprofessional care of a patient with intellectual disability and three comorbidities: attention-deficit hyperactivity disorder, autistic spectrum disorder, and Tourette syndrome, which were further complicated by environmental conditions at home and at school. This report's findings emphasize the importance of interprofessional practice in clinical care for patients facing multiple impediments to social functioning.

Key words: holistic care, inter-professional education, development retardation, attention-deficit/hyperactivity disorder (ADHD), autistic spectrum disorder (ASD)

Introduction

Interprofessional practice is necessary when caring for patients with attention-deficit hyperactivity disorder (ADHD) or autistic spectrum disorder (ASD), and becomes increasingly important when a patient presents with multiple diseases and impediments to social functioning. However, few case reports have detailed the process of caring for a patient with these complicated disorders. We herein present one case of intellectual disability with three comorbidities: ADHD, ASD, and Tourette syndrome (TS). The patient in this case exhibited behavioral problems at home and at school,

including impulsive behavior, attention deficit, impaired daily activity, picky eating, violence, lying, stealing, and delayed speech development. Interdisciplinary approaches such as physical therapy, occupational therapy, speech therapy, and medication were prescribed to help the patient; as a result, his condition stabilized and gradually improved. This paper describes the interprofessional practice of this case.

Case Report

Medical history

The 9 year 5 month old boy was born through normal spontaneous delivery without

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perinatal insult. He was a full-term baby, with birth bodyweight appropriate for his gestational age. At 18 months of age he was noted to have below average cognition and delays in motor and language development. Following this diagnosis, the patient was enrolled in early intervention programs, including physical, occupational, and speech therapies. As he grew older, developmental delays were observed in social and emotional domains, characterized by impediments to social interaction and reciprocity, a narrow range of interests, and a tendency toward being overly persistent. Based on these observations, a diagnosis of ASD was highly suspected.

Shortly before his 6th birthday, the patient received a diagnosis of ADHD and underwent methylphenidate therapy. At the age of 8, he visited a pediatric neurologist's clinic due to intermittent up-and-down body movement that had persisted over 3 months. This movement only occurred during the waking period, with a frequency as high as 1 – 2 times per minute. The patient had also been exhibiting an intermittent throat-clearing tic for the past year. The boy denied any associated discomfort or functional impairment, such as falling over due to the movement. He experienced no conscious change, headache, dizziness, weakness, or paresthesia.

An electroencephalogram (EEG) was conducted, revealing frequent spikes and spike-waves in isolation and clusters in the bilateral occipital area, extending to the parietal area during sleep. Based on this clinical presentation of symptoms, the boy received a diagnosis of TS. Although the boy did not fulfill the diagnosis of epilepsy, considering the concurrent occurrence of TS and EEG abnormality, low-dose topiramate was prescribed and his involuntary movement and vocal tics both disappeared.

Family environment

Both the patient and his mother were on the receiving end of violence at the hands

of the patient's father, and the patient experienced sibling bullying concurrent with the onset of intellectual disability at 18 months of age. Later, the patient also began to exhibit verbal violence toward his mother and physical violence toward his younger sister. His family condition improved after his parents divorced when he was 6 years old.

School environment

When the patient started elementary school, his condition deteriorated due to a series of events. The teacher exhibited a negative attitude toward the patient, punishing him frequently. The patient was also targeted for bullying by his classmates because of his abnormal behavior. The therapist suggested to the mother to explain his condition to the school, which she did. Thereafter, his teacher and classmates accepted his condition and the bullying ceased.

Interprofessional practice

Members of the rehabilitation center organized a multiprofessional team to care for the patient. This team included a physiatrist doctor; a pediatric doctor; a psychiatric doctor; a physical therapist; an occupational therapist; a speech therapist; a psychiatrist; a social worker; pharmacists; and his main caretaker, his mother. The occupational and physical therapists assisted in assessing the patient's functional impairment, strengths, needs, and support required. The speech therapist assessed any disturbance in speech, language, and communication.

Under the guidance of the physical therapist, the boy became more patient and less impulsive. After intervention, he was capable of finishing his homework, and his everyday function improved. His need for external aid also decreased.

After 6 months of speech therapy, the patient's articulation improved to the point where he could communicate with others efficiently

and properly. His behavior problems gradually decreased as a result. Speech therapy enhanced his self-confidence and sense of accomplishment, which in turn increased his motivation. He was willing to attempt to solve his own problems, and he practiced on his own.

After several years of team therapy, the patient's mood stabilized, and his emotional control, academic performance, and social skills improved.

Discussion

Pharmacy

ADHD is a neurobehavioral developmental disorder primarily characterized by the coexistence of attention problems and hyperactivity. ADHD is highly heritable and multifactorial, with genetic, dietary, social, and environmental causes.

The World Health Organization states that the diagnosis of ADHD can represent family dysfunction or inadequacies in the educational system rather than individual psychopathology.¹ Other researchers believe that relationships with caregivers profoundly affect intentional and self-regulatory abilities.²

In this case, methylphenidate, one of the most common stimulants, was prescribed from the age of 6 to 7 to alleviate ADHD symptoms after behavioral therapy failed to deliver satisfactory results. Motor tics were noticed approximately 1 year later. Researchers have hypothesized that stimulants may lead to the onset of tics or worsening of preexisting tics in patients with TS. However, according to review articles, group data analyses indicate no significant increase in tics when stimulants are used in patients with ADHD.³

In addition to ADHD and TS, the patient also had a global developmental delay, which refers to a disturbance in an individual child across one or more developmental domains, including motor, cognition, daily activities, speech, and language. The history of the patient

and examination results detailed in this study may elicit characteristics of a specific cause for the developmental delay and also be used to identify comorbidities and associated conditions (i.e., ASD, ADHD, and cerebral palsy).⁴

Physical therapy

From the physical therapist's perspective, the patient's primary problem was impulsive behavior, characterized by spilling classmates' drinks and pushing or hitting others. The secondary problem was attention deficit. The patient could not focus on his homework and usually required 1 to 2 hours to finish his task. The mother usually tried to correct the patient's behavior by punishing him. A clinical Swanson, Nolan, and Pelham-IV questionnaire (SNAP-IV) was used to evaluate the patient for ADHD, and four strategies were devised to help him:

- Treadmill exercise: this was employed to expend his excess energy. Regular exercise, such as jogging, was also encouraged during his daily life.⁵
- Waiting Practice: during a game of throw-and-catch, the patient was asked to count from one to ten, and then throw the ball. The numbers were increased gradually to correct his impulsive behavior.⁶
- School environment simulation: in the simulation, appropriate behavior was demonstrated for the patient to emulate.⁶
- Understanding the patient's behavior: misbehavior might be attributed to attention recall issues or simple boredom.

Occupational therapy

The goal of occupational therapy is to help patients select, arrange, and undertake their daily activities.⁷ Therapists should base their practice on occupational science and analyze the patient's activity to understand the patient's behaviors and to design training courses; these are done to either improve the patients' function or soften the environmental

demands. The primary goal is to help patients engage in purposeful activity and achieve partial independence. This gives them a sense of accomplishment and induces their interest in further training.

Several strategies were used to help the patient. First, cognitive-behavioral strategies were employed to address the patient's behavioral problems.⁸ Therapists helped the patient understand the rules and clarify their rationale. The patient was taught to set achievable goals and deadlines, and these goals were modified according to his progress.

Second, therapists used desensitizing techniques to address the problem of picky eating. The patient was presented with several short-term goals that could easily be achieved step-by-step. At first, he was only required to put food into his mouth. Gradually, he was challenged to chew and swallow it.

Speech therapy

Usually, children with ADHD demonstrate normal speech development in standardized language assessments. However, because of their poor organization of verbal messages and poor self-monitoring ability, they cannot obey social rules when interacting with others, and thus cannot achieve efficient communication. In addition, their speech intelligibility is poor. In this case, the patient substituted backing consonants for apical and interdental consonants during spontaneous speech and reading. This reduced his communication efficiency and affected phonetic processing performance.^{9,10}

Children with ADHD have poor interpersonal relationships, leading to many behavioral problems. The patient in this study attacked his classmates by pulling their hair, disobeyed class rules, and stole things. Punishments stemming from these actions made the patient feel inferior. The speech therapy sequence started with an examination of the patient's emotional response to each punishment. We

clarified why he had been punished, helped adjust his behavior appropriately, encouraged his positive behavior, and began training exercises to improve articulation and communication.

Next, we helped the patient identify the target sound in an article and let him read aloud to improve phonological awareness. This was a priority because phonological awareness is significantly related to literacy in school-age children.⁹

Conclusions

The patient's condition improved through a combination of holistic healthcare and interprofessional practice. After treatment, he exhibited greater self-control and could be understood by others, including his teacher, classmates, and therapists. This sense of accomplishment made him more willing to cooperate during subsequent sessions. The results of this study demonstrate that interprofessional practice from pharmacists, physical therapists, occupational therapists, and speech therapists is required for patients with a complex variety of problems.

Author Contributions

Study Design, Po-Jui Ko and Chia-Chen Lin; Data Collection, Chia-Chen Lin, Wan-Ting Tsai, Wan-Lun Kuo, Chia-Hao Hsu, Yu-Chia Kao, Guo-Hua Mae, Wei-Chieh Chiu, and Po-Jui Ko; Data Interpretation, Chia-Chen Lin, Wan-Ting Tsai, Wan-Lun Kuo, Chia-Hao Hsu, Yu-Chia Kao, Guo-Hua Mae, Wei-Chieh Chiu and Po-Jui Ko; Manuscript Preparation, Chia-Chen Lin, Wan-Ting Tsai, Wan-Lun Kuo, Chia-Hao Hsu, Yu-Chia Kao, Guo-Hua Mae, Wei-Chieh Chiu and Po-Jui Ko; Literature Search, Po-Jui Ko.

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References

1. Tandon M, Pergjika A: Attention deficit hyperactivity disorder in preschool-age children. *Child Adolesc Psychiatr Clin N Am* 2017;26:523-38. doi: 10.1016/j.chc.2017.02.007.
2. Thapar A, Cooper M: Attention deficit hyperactivity disorder. *Lancet* 2016;387:1240-50. doi: 10.1016/S0140-6736(15)00238-X.
3. Krinzinger H, Hall CL, Groom MJ, et al: Neurological and psychiatric adverse effects of long-term methylphenidate treatment in ADHD: a map of the current evidence. *Neurosci Biobehav Rev* 2019;107:945-68. doi: 10.1016/j.neubiorev.2019.09.023.
4. van Karnebeek CDM: Evaluation of the child with developmental impairments. *Continuum (Minneapolis, Minn)* 2018;24:228-47. doi: 10.1212/CON.0000000000000564.
5. Vysniauske R, Verburgh L, Oosterlaan J, et al: The effects of physical exercise on functional outcomes in the treatment of ADHD: a meta-analysis. *J Atten Disord* 2020;24:644-54. doi: 10.1177/1087054715627489.
6. Lambez B, Harwood-Gross A, Golumbic EZ, et al: Non-pharmacological interventions for cognitive difficulties in ADHD: a systematic review and meta-analysis. *J Psychiatr Res* 2020;120:40-55. doi: 10.1016/j.jpsychires.2019.10.007.
7. Bodison SC, Parham LD: Specific sensory techniques and sensory environmental modifications for children and youth with sensory integration difficulties: a systematic review. *Am J Occup Ther* 2018;72:7201190040p1-p11. doi: 10.5014/ajot.2018.029413.
8. Gilboa Y, Helmer A: Self-management intervention for attention and executive functions using equine-assisted occupational therapy among children aged 6-14 diagnosed with attention deficit/hyperactivity disorder. *J Altern Complement Med* 2020;26:239-46. doi: 10.1089/acm.2019.0374.
9. Martins RA, Ribeiro MG, Pastura GMC, et al: Phonological remediation in schoolchildren with ADHD and dyslexia. *Codas* 2020;32:e20190086. doi: 10.1590/2317-1782/20192019086.
10. Randolph CC: Overview of phonological disorders: the language-based speech sound disorder. *J Phonet Audiol* 2017;3:1000128. doi: 10.4172/2471-9455.1000128.