Osmotic Release Oral System (OROS) Methylphenidate–Induced Double Incontinence: A Case Report

To the Editor: Attention-deficit/hyperactivity disorder (ADHD) is the most prevalent psychiatric disease in children and adolescents, affecting approximately 5% of children worldwide.[1] The pathophysiologic profile of ADHD has not been fully characterized, although structural and functional imaging studies consistently suggest dysfunction in fronto-subcortical pathways and imbalances in dopaminergic and noradrenergic systems in the origin of the core symptoms.[2]

The central nervous system (CNS) stimulants, especially the immediate and long-acting forms of methylphenidate, are the first-line treatments for ADHD. Studies analyzing the effect of methylphenidate on the neuropsychologic performance of adults with ADHD report significant improvements in performance associated with marked therapeutic response.[3] The common side effects of CNS stimulants include sleep disturbance, depressed mood, stomachache, tics, and mannerisms. However, no case of concurrence of urinary and fecal incontinence (double incontinence) associated with the administration of osmotic release oral system (OROS) methylphenidate has been reported before. Here, we present a case of a young patient with ADHD who developed simultaneous double incontinence after the use of OROS methylphenidate 36 mg.

Case report. An 8-year-old boy was brought to our child and adolescent psychiatric outpatient clinic in August 2007 because of frequent delays in completing schoolwork and difficulty in maintaining attention in class. His academic performance was above average but unstable. His weight was 25 kg and his height was 126 cm. No major physical or mental illness was previously noted. There was no family history of enuresis and encopresis. His motor and language development have followed the normal developmental milestones. He was diagnosed with ADHD according to the *DSM-IV* criteria.

The outcome measure Swanson, Nolan, and Pelham Scale, version IV (SNAP-IV),[4] was completed by his mother. The boy took immediate-release methylphenidate 10 mg every morning for the first 2 weeks, which was then switched to OROS methylphenidate 18 mg/d. No overt side effect was reported by his mother. In order to reach the optimal response, the medication was further switched to OROS methylphenidate 36 mg/d for 2 weeks. The patient developed stool incontinence during the use of OROS methylphenidate 36 mg daily. His mother reported that loss of bowel control occurred every day and was frequent during the daytime. It was also reported that this child experienced urinary incontinence almost every day. He was scolded by his mother but continued to take medication because of a marked improvement of his ADHD symptoms as rated on the SNAP-IV.

Two weeks later, his mother brought him back to our clinic. Urologic and gastroenterologic consultation did not reveal any abnormal finding. A routine laboratory examination did not suggest any organic cause for the double incontinence. He did not take any other medication during the administration of OROS methylphenidate. The condition of double incontinence completely resolved rapidly after the discontinuation of OROS methylphenidate 36 mg.

ADHD is a CNS disorder. Children with ADHD often require additional supervision or a more structured learning environment to keep up with their peers. Although CNS stimulants have been the standard treatment for ADHD, their mechanism of action is still not well understood. It is clear that methylphenidate mainly affects the dopaminergic and norepinephrine systems.[5] The brain noradrenergic pathway facilitates neuronal processes promoting behavioral activation, alertness, and attention.

Stimulants are associated with loss of appetite, headache, stomachache, and insomnia.[6] Though many side effects of stimulants are transient in nature and may resolve without treatment,[7] it is prudent to monitor side effects that do not compromise the patient's health or cause discomfort that interferes with functioning.

The bladder is vulnerable to the adverse effects of drugs because of its complex control and the frequent excretion of drug metabolites in the urine. Incontinence results when bladder pressure exceeds sphincter resistance.[8] The Adverse Drug Reaction Probability score[9] in this patient was 7, denoting a probable adverse reaction caused by OROS methylphenidate 36 mg. Because of ethical considerations, this patient did not undergo rechallenge with OROS methylphenidate.

The pathophysiology of the side effects he encountered is likely to be derived from certain actions on central mechanism and increased vulnerability to the sympathomimetic effects of a stimulant drug. Adrenergic blockade effect is suggested to cause fecal incontinence by decreasing the tonus of the internal anal sphincter[10] and urinary incontinence by decreasing the tonus of the internal urethral sphincter.[11]

The antagonist effect of OROS methylphenidate on the α_1 receptors of the internal anal sphincter may cause fecal incontinence, and the effect on the internal bladder sphincter may cause urinary incontinence. To our knowledge, this is the first case report of double incontinence observed during the treatment of ADHD with OROS methylphenidate 36 mg. This phenomenon had rapid remission after discontinuation of the drug. It is likely that individual patient characteristics contribute to the possibility of such an adverse event. The causality in this case might be dose-related, and careful monitoring is highly suggested.

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