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Clinical Effects of Methylphenidate Compared to Oxybutynin on Management of Giggle Incontinence

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Abstract:

Background and Aim: Giggle incontinence, also known as "enuresis risoria", is characterized by unexpected, involuntary, and complete bladder voiding in response to laughter. The cause is unknown; however, there are different assumptions based on several case studies. This research discusses the effectiveness of methylphenidate for giggle incontinence in children.

Methods: Fifteen girls who met the giggle incontinence criteria were randomly divided to two groups: group A (n=8 girls) and group B (n=7 girls). The participants in group A took Oxybutynin chloride and the patients in group B received methylphenidate for one month. The response of the two groups to drugs was assessed.

Results: Group A included 8 girls (mean age: 7.7 years) and group B comprised 7 girls (mean age: 8.4 years). Only one patient in group A showed complete response to Oxybutynin chloride. No wetting was reported by six patients in group B.

Conclusion: Giggle incontinence is a rare form of incontinence. The pathophysiology is unfortunately unknown yet. Methylphenidate may be suggested for symptomatic relief compared to Oxybutynin chloride until the etiology of the disease is more clearly defined.

Keywords: Giggle incontinence; Giggle micturition; Laughter incontinence; Enuresis.

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Introduction

Giggle incontinence (GI) is defined as involuntary and usually unexpected release of urine during giggling or laughter when other stress incontinences are absent.

The pathophysiology is not clear (1). Giggle incontinence is socially embarrassing (2).

During decades, research works and case studies have expanded the knowledge that we have currently about GI; however, the main cause is still unknown, which hinders clinical management (3). One study found that pediatric GI was caused by detrusor instability created by

laughter, which may be improved with an effective treatment of detrusor instability (4).
Different clinical management options and treatments have been suggested (1,3,4). Methylphenidate (MPH) is a practical medical option for giggle incontinence (2). Therefore, this study was conducted to examine the effectiveness of methylphenidate in giggle incontinence in children.

Methods

In this study, 15 female pediatric patients with GI who presented to the nephrology department were studied according to a randomized, institutional review board approved protocol. The diagnosis was made based on the patient history, including laughter induced complete bladder emptying, no associated lower urinary tract symptoms or other wetting, and no structural abnormalities of the genitourinary tract. The patients aged 5-11 years old. After explanation of study rationale, informed consent was obtained from the parents or legal guardians of the patients and verbal consent was obtained from children older than seven years old. Initially, all patients were assessed by careful history taking, physical examination, urinalysis, and kidney and bladder ultrasonography. Children with any neurological defect on physical examination, urinary tract malformation, or obstruction were excluded from the study. Patients were then randomly divided to two groups: group A (n=8) and group B (n=7). Patients in group A received Oxybutynin chloride 0.1 mg/kg/day and participants in group B took MPH 0.2 mg/kg/day in the morning before going to school for one month. The patients were evaluated after one month, and treatment outcomes were determined as no response, partial response (50% decrease in the frequency of incontinence), and complete response. Data were collected and analyzed with SPSS16 software. The significance level for all statistical tests was set at 0.05. The one-sample Kolmogorov–Smirnov test was used to determine whether data were normally distributed. For parametric variables, a t-test on two independent samples was applied to compare the two groups. Research committee of Mashhad University of Medical Sciences approved this study.

Results

All 15 patients, 8 in the Oxybutynin chloride (A) group and 7 in the MPH (B) group, were girls. The mean age of the patients in group A and B was 7.75±1.48 and 8.4±2.1 years, respectively. T-test showed no significant difference in the mean ages between the two groups. The results of renal and bladder ultrasound were abnormal in 5 patients (62.5%) in group A and 4 patients (57.1%) in group B. As for urinalysis, 3 patients (37.5%) in group A and 2 patients (28.6%) in group B had microscopic hematuria.
In group A, one patient showed complete response and two patients had partial response after one month. In group B, incontinence episodes were completely resolved in six of seven patients. The other patient showed a partial response (50% decreases in the frequency of incontinence) after one month. The results are summarized in Table 1. No side effects were reported.

Table 1. Frequency of outcomes in Group A and B

Response	Group A: Oxybutynin chloride	Group B: Methylphenidate
Complete	1 (12.5%)	6 (85.7%)
Partial	2 (25%)	1 (14.3%)
No Response	5 (62.5%)	0 (0%)
Total	8 (100%)	7 (100%)

Discussion

According to our study, MPH is more effective for treatment of GI compared to Oxybutynin. GI is difficult to treat because its etiology and prevalence are not yet clear. Different treatments have been tried for this complication. Chandra reported that 7% of 1,421 children referred to the pediatric nephrology department were diagnosed with GI (4).
According to a systematic review of GI, there is disagreement over the pathophysiology of laughter incontinence as two different explanations are suggested (3). The first explanation focuses on the neurologic root of the cascade of events during laughter and voiding and relates it to cataplexy and other CNS disorders (3). This explanation recommends treatment with MPH (3). The second explanation addresses urologic dysfunction and recommends

biofeedback and bladder retraining as efficient therapies (3). A comprehensive treatment for laughter incontinence in children should consider both concepts. Considering the nature of the problem, it has also been discussed whether the term "giggle incontinence" is the right terminology for laughter incontinence (3).

In another study, the role of family history was investigated and a positive family history was reported for that entity and diurnal voiding symptoms in 13% and 28% of the GI cases, respectively (4). The authors reported that GI improved in all patients after detrusor instability treatment. It was completely treated in 89% of the patients (4). They concluded that GI was caused by detrusor instability induced by laughter and could be improved by treating detrusor instability (4).

Another study found that patients with GI could heighten external urinary sphincter awareness and muscle recruitment employing biofeedback techniques (1). This study showed that treating GI with only education and pharmacotherapy could only achieve a partial response. The authors suggested that biofeedback therapy should be considered in the clinical management of GI in children before pharmacotherapy (1).

A clinical trial study evaluated the use of MPH for treatment of GI in pediatric patients and reported an 80% cure rate. The authors suggested that MPH was an effective option for managing GI symptoms when accepted by families (2). Our study demonstrated the efficacy of MPH as a therapeutic agent for GI. Incontinence episodes were completely resolved in 85.7% of the patients after 1 month of MPH therapy, and 14.3% had partial response (50% decrease in the frequency of incontinence).

Telli (5) found that regardless of the medication used, medical therapy for GI had a failure rate of more than 50%. Drugs may cause severe side effects with no considerable benefits (5). They concluded that there was no standard treatment for GI (5). Berry (2) found that in 9 out of 12 patients, the symptoms recurred following medication termination after a two-month treatment course (2). Further studies are required to evaluate the rate of recurrence after MPH therapy (2). Moreover, more investigations are needed to elucidate the mechanism of action of MPH, duration of therapy, and pathophysiology of GI. Unfortunately, our study included a relatively small number of patients, so future studies with larger sample sizes and longer follow-up periods are recommended.

Conclusion

GI is a rare form of incontinence with an unknown pathophysiology. MPH can be administered as a more effective drug for symptomatic relief of GI compared to Oxybutynin chloride until the etiology of the disease is clearly be defined.

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Conflict of Interest

The authors have no conflict of interest to declare.

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