

## Awake Bruxism after Initiation of Sustained Release Methylphenidate (CONCERTA)

Nouf Backer Al Backer\*

Department of Pediatrics, College of Medicine, King Saud University and King Khalid University Hospital, Riyadh, Saudi Arabia

\*Corresponding author: Nouf Backer Al Backer, Assistant Professor of Pediatrics, Consultant, Developmental Behavioral Pediatrics, Department of Pediatrics (39), College of Medicine and King Khalid University Hospital, King Saud University, Riyadh 11461, Saudi Arabia, Tel: +966 554180080; Fax: +966(11) 467-9463; E-mail: nalbacker@ksu.edu.sa

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### Abstract

Attention deficit hyperactivity disorder (ADHD) is a common disorder that affecting about 5-10% of school age children. A Sustained release methylphenidate (CONCERTA) is commonly used to treat such condition in children. It has a great efficacy in ADHD children. A lot of reports have documented the relationship between MPH and sleep bruxism. However, there is a paucity of reports in the literature that documented awake bruxism as a side effect of sustained release MPH. Up to our knowledge there is only one report of its kind showing such relationships. We report the case of a 10-year - old girl who presented with awake bruxism after her third dose of sustained release MPH. It is a serious side effect of a sustained release methylphenidate (CONCERTA) that might affect health of oral cavity. So, it is important to pick it up early to prevent serious complication and improve quality of life for them.

**Keywords:** Sustained release methylphenidate; Bruxism; Sleep bruxism; Awake bruxism

### Introduction

Bruxism is a movement disorder that is characterized by involuntary rhythmic or spasmodic nonfunctional grinding or clenching of the teeth [1]. Bruxism may lead to breakage of dental restorations, significant damage of temporomandibular joint and facial pain [2]. It has two distinct circadian manifestations: sleep bruxism and awake bruxism [2,3]. The prevalence rate for awake bruxism is about 20% and for sleep bruxism is 8-16% in adult population [4]. Awake bruxism is more common in females compared to males; however, there is no such gender difference with sleep bruxism [5]. Sleep bruxism was recently classified as a sleep-related movement disorder and it is considered as involuntary behavior [6,7]. Awake Bruxism is considered as a semivoluntary 'clenching' activity and can be associated with stress [5]. Methylphenidate has common side effects such as: stomachache, headache, insomnia, and decreased appetite. Several reports have documented the relationship between sustained release MPH and sleep bruxism [8]. In this report, we present a school-age girl with ADHD who developed awake bruxism after the initiation of a sustained release MPH treatment (CONCERTA). In the literature, this is the second report of MPH-related awake bruxism.

### Case Report

A 10-year-old girl who was referred to Developmental- Behavioral pediatric outpatient clinic with a history of poor concentration and hyperactivity that affecting daily functions and school performance. She was hyperactive since she was in Kindergarten. Then, she was enrolled in grade 1 and continues to have hyperactivity, difficulties with concentration and impulsivity. In grade 3, she had a significant drop in academic performance and continues to drop recently in grade 4. She has a strong family history of ADHD. Comprehensive Clinical

evaluation including history and physical examination indicate no evidence of seizures or other medical problems. As a result, EEG wasn't done for her. laboratory assessment was in the normal range. She was diagnosed with ADHD combined subtype by reviewing clinical history and questioners that were filled by teacher according to the criteria of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (American Psychiatric Association 2013).

Sustained release MPH form (CONCERTA) 18 mg once per day was started. On the third day of CONCERTA, she started to have severe teeth grinding during daytime. No teeth grinding was noted at night. On the fourth day of the treatment, her mother did not give her CONCERTA and no bruxism was reported. Accordingly, her mother had decided to restart CONCERTA of the same dose again. Awake bruxism was noted back again with the same severity and continued while she was on CONCERTA. There was no evidence of abnormal movement that involving any other part of her body. CONCERTA was discontinued because of teeth grinding and resolved completely.

### Discussion

In our case report, there was no previous history of awake bruxism before MPH administration. It is clear that the onset of awake bruxism was associated with the initiation of sustained release MPH (CONCERTA) that resolved completely after stopping CONCERTA and then reappeared after starting CONCERTA again. In the literature, there is only one report of awake bruxism with sustained release MPH (CONCERTA) in 9 years old boy who was diagnosed with ADHD and started on CONCERTA 18 mg. He developed awake bruxism after second dose of CONCERTA, which resolved completely upon discontinuation of CONCERTA [9]. Sleep bruxism was reported more frequently than awake bruxism as a side effect of sustained release MPH (CONCERTA) [8,10].

The causes of bruxism are poorly understood and it is considered to have a multifactorial etiology [7]. Recently, it is hypothesized that

bruxism is a centrally mediated disorder [11,12]. It is speculated that bruxism is the result of involvement of the basal ganglion through disturbance in the dopamine-mediated transmission of action potentials, which is involved in the coordination of movements [12]. Chronic long-term use of L-dopa results in increased bruxism activity [11]. Amphetamine increases dopamine concentration by facilitating its release and thus precipitates bruxism [11]. Bruxism is not a life-threatening disorder, however, it could seriously affect health of the oral area such as frequent fractures and pain in the oro-facial region. A lot of devices have been developed to detect bruxism and seem to be potentially useful and easy to use in the clinic [13,14]. However, more studies need to be done to validate such devices [15]. In conclusion, clinicians who are involved with such cases and using MPH should be aware of awake bruxism as a side effect of MPH after administration of the initial dosages.

More researches are required to clarify the pathology of such adverse effect. Validity of different devices to evaluate bruxism needs to be determined.

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