

Case Report

Increase in Restless Legs Syndrome due to the Consumption of Food Rich in Added Sugar. Study with a Repeated N-1-trial

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Abstract

Restless Legs Syndrome is a common neurological disorder characterized by uncomfortable and unpleasant sensations in the legs with an urge to move. The symptoms occur at rest, are relieved by movement, and are worse in the evening and at night and are a cause of sleep disturbances. A patient is presented who reports that consuming sugary foods, such as ice cream, soft drinks, candy, chocolate and pastries, increases his symptoms of RLS. With an n-1-trial, a study for one patient, he is alternately exposed to sugar-rich and low-sugar food, which shows that his complaints increase or decrease. An increase in the symptoms of Restless Legs Syndrome (RLS) due to the use of high-sugar foods has not previously been described in the literature.

Keywords: Food; n-1-trial; Restless Legs; Sleep disturbance; Sugar

Introduction

Restless Legs Syndrome (RLS) is a common disorder and is characterized by an urge to move the legs, usually in association with discomfort [1]. RLS is a disorder of the central nervous system. The symptoms occur at rest, are relieved by movement, and are worse in the evening and at night. The cause of RLS is unknown. Dopamine may play a role as a transmitter. Iron deficiency can be a cause [2]. The severity and frequencies vary widely. For symptoms occurring at least twice a week and resulting to moderate or severe distress,

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the prevalence is 1,5% to 2,7 %. [3,4]. RLS is a cause of disabling sleep-onset or maintenance insomnia and may result in reduced quality of life [5], depression, and increase risk of suicide [6,7]. RLS is associated in chronic renal failure [8], also in pregnancy [9]. Heredity is a factor [10]. Dopamine agonists (Ropinirol), alpha2-delta calcium channel ligands (pregabalin, gabapentin) and opioids are effective therapies, but understanding of the mechanisms through which they work will depend on better elucidation of the underlying disease pathogenesis. RLS has a major impact and symptoms are often not recognized [11]. RLS is important for primary care physicians to be familiar with the disorder and its management. In the following case, a patient is presented who indicates that he experiences more symptoms of RLS when consuming sugar-rich food. Increase of RLS due to intake of free and added sugars (sucrose) in the diet did not yield any articles in the PubMed database describing this increase. However, a case has been described in which RLS is caused by the artificial sweetener Stevia [12]. In another case described, the symptoms of RLS are aggravated by saccharin, also an artificial sweetener [13]. Stevia and saccharin are 400 times as sweet as granulated sugar (sacharose, sucrose).

Case Report

A healthy man, 60 years old, known with a mild RLS, visits his general practitioner because of his symptoms of RLS that have increased since the summer. He has the impression that this is because he has consumed a lot of sweet foods such as ice cream, chocolate, soft drinks and pastries during his summer vacation. He does not use any medication or drugs, no alcohol and he does not smoke. His blood sugar and ferritin levels are normal.

The patient is asked to participate in an n-1-trial to see to what extent a sugar-rich or a low-sugar diet influences his complaints. An n-1-trial is a study by one patient [13]. To determine the patient's complaints, he is asked to complete a questionnaire from the International Restless Legs Syndrome Study Group (IRLSSG) (Table 1).

The patient is sequentially and alternately exposed to a sucrose-rich and a sucrose-poor diet. He starts with a sucrose-rich diet with lots of sweets such as ice cream, cakes, sweet soft drinks, sweet spreads, chocolate and candy for one week. Every day he fills in the questionnaire and measures his score. Subsequently, he should follow a low-sucrose diet also for one week, avoiding added sugars as much as possible. He is asked to assess the packaging of foodstuffs and to use only those products to which less than 3 grams per 100 grams/100 ml sugar has been added. These are in particular unsweetened dairy products: coffee, tea, milk, fish, vegetables, fruit, lean meat and meat products. He can also use: bread, aged cheese, pasta, potatoes and rice. Soft drinks and foods with artificial sweeteners should be avoided. The study is repeated alternately three times and thus lasts 6 weeks. The research and the scores show that the patient's score is on average 26 (severe RLS) with a high-sugar diet and 6 (mild RLS) with a low-sugar diet. The complaints are considerable with a high-sugar diet and decrease with a low-sugar diet.

<p>Have the patient rate his/her symptoms for the following ten questions. The patient and not the examiner should make the ratings, but the examiner should be available to clarify any misunderstandings the patient may have about the questions. The examiner should mark the patient's answers on the form.</p>	
<p>In the past week... (1) Overall, how would you rate the RLS discomfort in your legs or arms? _ (4) Very severe _ (3) Severe _ (2) Moderate _ (1) Mild _ (0) None</p>	<p>In the past week... (6) How severe was your RLS as a whole? _ (4) Very severe _ (3) Severe _ (2) Moderate _ (1) Mild _ (0) None</p>
<p>In the past week... (2) Overall, how would you rate the need to move around because of your RLS symptoms? _ (4) Very severe _ (3) Severe _ (2) Moderate _ (1) Mild _ (0) None</p>	<p>In the past week... (7) How often did you get RLS symptoms? _ (4) Very often (6 to 7 days in 1 week) _ (3) Often (4 to 5 days in 1 week) _ (2) Sometimes (2 to 3 days in 1 week) _ (1) Occasionally (1 day in 1 week) _ (0) Never</p>
<p>In the past week... (3) Overall, how much relief of your RLS arm or leg discomfort did you get from moving around? _ (4) No relief _ (3) Mild relief _ (2) Moderate relief _ (1) Either complete or almost complete relief _ (0) No RLS symptoms to be relieved</p>	<p>In the past week... (8) When you had RLS symptoms, how severe were they on average? _ (4) Very severe (8 hours or more per 24 hour) _ (3) Severe (3 to 8 hours per 24 hour) _ (2) Moderate (1 to 3 hours per 24 hour) _ (1) Mild (less than 1 hour per 24 hour) _ (0) None</p>
<p>In the past week... (4) How severe was your sleep disturbance due to your RLS symptoms? _ (4) Very severe _ (3) Severe _ (2) Moderate _ (1) Mild _ (0) None</p>	<p>In the past week... (9) Overall, how severe was the impact of your RLS symptoms on your ability to carry out your daily affairs, for example carrying out a satisfactory family, home, social, school or work _ (4) Very severe _ (3) Severe _ (2) Moderate _ (1) Mild _ (0) None</p>
<p>In the past week... (5) How severe was your tiredness or sleepiness during the day due to your RLS symptoms? _ (4) Very severe _ (3) Severe _ (2) Moderate _ (1) Mild _ (0) None</p>	<p>In the past week... (10) How severe was your mood disturbance due to your RLS symptoms - for example angry, depressed, sad, anxious or irritable? _ (4) Very severe _ (3) Severe _ (2) Moderate _ (1) Mild _ (0) None</p>
<p>Sum of scores =</p>	
<p>Scoring criteria are: Mild (score 1-10); Moderate (score 11-20); Severe (score 21-30); Very severe (score 31-40)</p>	
<p>1. Answers for this IRLS are scored from 4 for the first (top) answer (usually 'very severe') to 0 for the last answer (usually none). All items are scored. The sum of the item scores serves as the scale score. The International Restless Legs Syndrome Study Group holds the copyright for this scale.</p>	

Table 1: Restless legs syndrome rating scale.

Note:

The rating scale of RLS complaints ranges from 1-40.

0 points: No RLS.

1-10 points: Mild RLS.

11-20 points: Moderate RLS.

21-30 points: Severe RLS.

31-40 points: Very severe RLS.

Discussion

RLS is a common condition in the population. It causes sleep disturbances. These can cause concentration problems and daytime drowsiness, making driving and working in dangerous occupations riskier. Our diet consists largely of refined sugar. Ice cream and

pastries, chocolate, sweets and soft drinks consist of 30-60% pure sugar (sucrose). Sugars are added to many other packaged food products. However, refined sugar (sucrose) is not an essential nutrient, but contributes secondary to obesity, diabetes mellitus and caries. The World Health Organization (WHO) recommends no more than 35-50 grams of added sugar per day to reduce these diseases. The suggestion

is that sugar has a direct effect on some diseases, but only in ADHD there is evidence of an increase in symptoms, but the evidence is inconclusive [14]. The drug treatment of RLS mainly involves dopamine agonists, but these drugs have significant side effects such as an increase in symptoms with long-term use (augmentation) [15]. Following a low-sugar diet requires discipline, but if it significantly reduces or completely eliminates the symptoms of RLS, it is a preferred measure and can be used on a trial basis before prescribing medication.

A double-blind placebo-controlled study could not be carried out in this study, as a diet, given the taste of it, is unsuitable for this purpose. Bias was considered minor as the study was repeated three times.

Conclusion

Research shows that a diet with a low amount of added sugars causes considerably fewer symptoms of Restless Legs Syndrome in a patient than with a sugar-rich diet. RLS has a significant impact. The use of dopamine agonists, drugs used in RLS, but which have many side effects, can in some cases exacerbate the condition. In patients with RLS, a low-sugar diet containing few added sugars can be used to try to reduce the symptoms before prescribing medication without harming the patient.

Conflict of Interest

The author declare that there is no conflict of interest regarding the publication of this article.

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