Narcolepsy-Like Symptoms in a Patient with Down Syndrome and Without Obstructive Sleep Apnea

Luis Domínguez-Ortega, MD, PhD*; Rafael J. Salin-Pascual, MD, PhD**; Elena Díaz-Gállego, Psy ***


Objective: The study reports on a 33-year-old Caucasian female with Down syndrome and narcolepsy-like symptoms.

Method: After medical and genetic screening, nocturnal polysomnography followed by a Multiple Sleep Latency Test and HLA typing were performed. The patient was medication free and reported a number of cataplexy attacks everyday. Each time that she came to the sleep disorders clinic, she was observed to have cataplexy. She also felt extremely drowsy. A mean sleep latency of 8.8 minutes with 4 sleep-onset rapid eye movement periods in the Multiple Sleep Latency Test, with no other sleep disorder that accounts for the symptoms, was obtained. The patient was DQB1*0301, DQB1*0602, as revealed by the last high-resolution serologic typing.

Key Words: Narcolepsy, Down syndrome, rapid eye movement sleep, sleep


INTRODUCTION

ONE OF THE LEADING CAUSES OF MENTAL RETARDATION IS DOWN SYNDROME, its impact affects not only the patients, but also their families.1 Sleep in these patients is characterized by a reduction in rapid eye movement (REM) sleep percentage, prolonged latency to the first REM period, an increase in undifferentiated sleep stage, and a reduced density in REMs during REM sleep.2 It has also been reported that patients with Down syndrome have a higher incidence of obstructive sleep apnea (63%), alveolar hypoventilation (81%), and oxygen desaturation (56%).3-5 These findings could be attributed to macroglossia and amygdalectomy, as well as to obesity and hypothyroidism.6 As part of the Down syndrome, some patients also have decreased muscle tone.

On the other hand, narcolepsy is a primary disorder characterized by excessive daytime sleepiness, sleep attacks, cataplexy, and sleep paralysis with hypnagogic hallucinations; REM sleep and sleep-continuity variables are also disturbed in narcoleptic patients.7 The etiology of narcolepsy in humans is unknown, although the role of the orexin/hypocretin system has recently been highlighted, both in animals and humans.8-10 There are also some reports of narcolepsy-like symptoms due to organic lesions such as midbrain tumors,11 pontine gliomas,12 and pontine and hypothalamic gliosis.13 This paper reports on the coexistence of Down syndrome and narcolepsy-like symptom in one patient. This finding could be accidental, considering the prevalence of narcolepsy-cataplexy (1/2000) and that of Down syndrome (1/1000), but an exhaustive MEDLINE search looking for a description of the coexistence of these two disorders failed to disclose other reports.

SUBJECT AND METHODS

A 33-year-old white female with Down syndrome (caryotype trisomy 21, 47, XX+21) was studied in the sleep disorders clinic. Nocturnal polysomnography (NPSG)—starting time 00:07; ending at 07:40—followed by a Multiple Sleep Latency Test (MSLT) (09:30, 11:30, 13:30, 15:30, 17:30) was performed four weeks after the patient discontinued all medications. Electroencephalogram (EEG) (C3-C4; O1-O2), electrooculogram, electromyogram (submental and bilateral anterior tibialis), electrocardiogram, oral and nasal airflow, thoracic and abdominal effort, and pulse oximetry were recorded with and simultaneous video recording. Recordings were obtained by a Nicolet EEG 1A97 18-channel polygraph and manually scored according to Rechtschaffen and Kales criteria.14 The MSLT was performed according to the American Sleep Disorders Association diagnostic criteria,15 beginning between 1.5 to 3.0 hours after the end of the NPSG.

The patient had been previously diagnosed as having epilepsy and treated with sodium valproate, vigabatrin, and lorazepam. She was referred to us because of her worsening condition in spite of the treatment. Both the patient and her family reported almost continuous attacks, described as sudden loss of muscle tone when excited over her favorite TV program or angry or laughing or very tired. They also reported that the patient was very drowsy during the day.

RESULTS

Neither the nocturnal electroencephalogram nor the one performed with photo stimulation and hyperventilation while the patient was awake showed paroxysmal abnormalities. A magnetic resonance imaging study showed pronounced degenerative changes at cervical vertebrae 5 and 7. The Holter electrocardiogram and basic laboratory tests (hematology, blood chemistry, and urine) did not show any abnormalities.

The results of the NPSG showed a REM sleep latency of 161.6 minutes, a sleep efficiency index of 0.96 (434.60 minutes of total sleep time over 453.0 minutes in bed with 18.4 minutes of total wake time), 50.2 minutes of stage 1 sleep, 198.4 minutes of stage 2 sleep, 80.1 minutes of slow wave sleep, 105.9 minutes of REM sleep, a sleep latency of 4.97 minutes, no significant respiratory disturbance index (apnea + hypopnea = 1.4) and no oxygen desaturation (minimum SaO2 = 90%). The MSLT showed a mean sleep latency of 8.8 minutes with 4 SOREMPs. The results of the last high-resolution serologic typing revealed that the patient is DQB1*1101, DQB1*1302/ DRB3*0203, DRB3*0206/ DQB1*0301, DQB1*0602.

After these results, imipramine (25mg/day) was administered, and the patient—initially seen once a week, then once a month, and at present once a year—showed a clinical improvement with almost no sudden loss of cataplexy attacks.
of muscle tone while at home, though at her last examination (05-16-2002), she still showed a cataplexy-like attack when she saw her attending physician.

**DISCUSSION**

The etiology of narcolepsy in humans is not yet well known but could be related to several factors. Some basic mechanisms of sleep regulation could be affected. Unfortunately, in this case, there is no study available of the hypocretin level in the cerebrospinal fluid. This case will make us search carefully for narcolepsy-like symptoms in patients with Down syndrome.

**REFERENCES**