

# Oral L-Carnitine used to treat narcoleptic type 1 patient during pregnancy - A case report

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## ABSTRACT

Narcolepsy type 1 is a sleep disorder characterized by excessive daytime sleepiness (EDS), sleep fragmentation, hypnagogic hallucinations, sleep paralysis, and cataplexy. Stimulant medications such as modafinil and amphetamines are the first-line medications for treating sleepiness. However, the management of narcolepsy during special circumstances of life such as pregnancy is complex. MMDM is a 34-year-old female with Narcolepsy type 1 treated with modafinil (400mg/d) and citalopram (20mg/d). Before she become pregnant, modafinil and citalopram were replaced for L-Carnitine 510mg/d with good outcome. She underwent an usual pregnancy and was submitted to a term cesarean delivery without child-birth complications. This is the first description of oral L-Carnitine such an alternative to treatment narcolepsy type 1 during pregnancy. Treat these patients is not easy but care narcolepsy pregnant is a challenging even bigger. In a disease without many treatment options, L-Carnitine can be used to treat daytime sleepiness during pregnancy in narcolepsy.

**Keywords:** Narcolepsy; Pregnancy; L-Carnitine.

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## INTRODUCTION

Narcolepsy type 1 is a sleep disorder characterized by excessive daytime sleepiness (EDS), sleep fragmentation, hypnagogic hallucinations, sleep paralysis, and cataplexy. Cataplexy and/or lower CSF hypocretin-1 levels define narcolepsy type 1<sup>1</sup>. A multimodal approach with pharmacological and behavioral therapy is required for narcolepsy's treatment. It includes a regular sleep schedule, short naps, and regular exercises. Stimulant medications such as modafinil and amphetamines are the first-line medications for treating EDS. Complementarily; REM-suppressant medications are the best option to avoid cataplexy, including sodium oxybate and the antidepressants.

However, the management of narcolepsy during special circumstances of life such as pregnancy is complex<sup>2</sup>. The majority of drugs used to treat narcolepsy is considered Class C.

Recently, a dysfunctional fatty acid-beta oxidation pathway with low serum acylcarnitine levels was related to narcolepsy. A randomized placebo-controlled trial in narcoleptic patients showed an improvement in somnolence after the supplementation of L-Carnitine<sup>3</sup>. In pregnant women, L-Carnitine supplementation for a variety of reasons showed no adverse effects<sup>4</sup>.

## CASE REPORT

MMDM is a 34-year-old female with Narcolepsy type 1 with excessive daytime sleepiness, hypnagogic hallucinations, sleep paralysis, and cataplexy. She has hypothyroidism taking levothyroxine (75mcg in the morning). The initial Epworth Somnolence Score (ESS) was 23/24. She had sleep study without sleep-onset REM and/or associated comorbidities. The multiple sleep latency revealed a mean sleep latency of 5 minutes and of 5/5 sleep-onset REM periods (SOREMPs) and the CSF hypocretin-1 level was zero. After treatment with modafinil (400mg/d) and citalopram (20mg/d) the patient had a moderate improvement of EDS (EES=19/24) and cataplexy (10 episodes per day to 2 episodes per week)<sup>5</sup>.

Before she become pregnant, modafinil and citalopram were removed and L-Carnitine 510mg/d was began with good outcome of EDS (EES=20). She had ten episodes of cataplexy per month. No new environmental or personal issues were noted during the pregnancy. She underwent an usual pregnancy (gain about 7 Kg in total) and was submitted to a term cesarean delivery without child-birth complications (Apgar 9/10 and 3,7 Kg). She stopped breastfeeding after 9 months and restarted previous treatment.

## DISCUSSION

This is the first description of oral L-Carnitine such an alternative to treatment narcolepsy type 1 during pregnancy<sup>6</sup>.

The natural history of narcolepsy during pregnancy is not completely understood. A retrospective study of 249 pregnant narcoleptic patients with cataplexy showed greater chance of complications, especially impaired glucose metabolism and anemia. Three patients had cataplexy during delivery. The option for cesarean procedure was higher in patients with cataplexy and the newborns did not have extra complications<sup>2</sup>.

Unfortunately, risks such as prematurity, low birth weight, and withdrawal symptoms are reported in patients on stimulants<sup>7</sup>. Authors believe that the risks of teratogenic effects of narcoleptic drugs such as amphetamines are overestimated, however these drugs are still considered class C during pregnancy and breastfeeding<sup>8</sup>. Recent study showed that patients with narcolepsy and cataplexy have higher prevalence of diabetes during pregnancy<sup>9</sup>.

Treat narcolepsy patients is not easy but care narcolepsy pregnant is a challenging even bigger. In a disease without many treatment options, L-Carnitine can be used to treat daytime sleepiness during pregnancy. Further double-blind randomized studies are important to clarify this matter and show the actual efficacy and safety of this drug in a very specific period of life.

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