The impact of acute administration of sodium oxybate on leg movement activity during sleep in narcolepsy with cataplexy

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Objectives: The general aim of this study was to analyze the acute effects of sodium oxybate (SO) on polysomnographic nighttime (PSG) and multiple sleep latency test of patients with narcolepsy with cataplexy (NC). We report here the effects of this treatment on leg movement (LM) activity during sleep.

Methods: Sixteen NC adult patients were recruited, together with 16 normal controls. Two consecutive PSG followed by two MSLT sessions were carried out, before and during the first night of SO assumption respectively. LM activity was analyzed by means of an approach particularly able to describe quantitatively their amount and time structure.

Results: Almost all LM activity parameters considered in this study were higher in NC patients than in controls; also, the periodicity index was slightly higher than that of normal controls. Under therapy with SO, there was a general moderate decrease in total sleep LM activity that was significant during NREM sleep. Furthermore, the number of periodic LM during sleep (PLMS) sequences was found to be significantly decreased after SO, as well as the periodicity index. At baseline, the intermovement interval distribution of NC patients showed only a very dubious and small peak in the “periodic” range (10-40 s). SO treatment caused a small general decrease, extending approximately between 2 and 50 s but reaching statistical significance only at very few points. Both the distribution of the number of PLMS and isolated LMs per hour of night were always higher in NC patients. PLMS in NC tended to show a bell-shaped distribution. After SO administration, PLMS tended to be lower throughout the entire night. The effects on the night distribution of isolated LM were less evident but reached statistical significance for the 6th and 8th recording hours.

Conclusion: The administration of SO in NC patients is followed by immediate important and complex effects on PSG parameters, including a moderate decrease in periodic and isolated LMs, possibly mediated by a disinhibited dopaminergic neuronal activity.