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Sleep Breathing Disorders

Board #309 : Poster session 1

DANGEROUS DRIVING RISK IN DRIVERS WITH OBSTRUCTIVE SLEEP APNEA WHO EXPERIENCE FATIGUE

D. Rizzo¹, G. Lavigne², J. Bergeron³, S. Bailes¹, L. Creti⁴, C. Fichten¹, E. Libman¹

¹Psychiatry, Lady Davis Institute for Medical Research, Jewish General Hospital, ²Dentistry, Université de Montréal, Hôpital du Sacré-Coeur, ³Psychology, Université de Montréal,

⁴Psychiatry, Jewish General Hospital, Montreal, Canada

Introduction: Most of the studies that evaluate risk of dangerous driving in individuals with obstructive sleep apnea (OSA) examine the role of sleepiness. It is known that fatigue is also a very common complaint among drivers with OSA, however, fatigue and sleepiness are rarely examined separately when assessing risk for dangerous driving in this population. The present investigation examines the role of daytime sleepiness and fatigue and how these relate to driving simulator performance in a newly diagnosed, untreated sample of individuals with OSA.

Materials and Methods: Participants with OSA (N=13; age: M=48.72, SD=10.02) were recruited from sleep clinics shortly after being diagnosed with OSA. Age- and gender-matched Control participants (N=5, age: M=43.77, SD=17.69) were recruited from the community through media advertisements. All participants completed a questionnaire on fatigue and sleepiness (*Empirical Sleepiness and Fatigue Scale, ESFS*). They also performed a 1.3 hour driving simulation task at the Université de Montréal driving simulator laboratory. Participants were categorized into high/low fatigue and high/low sleepiness groups based on median splits on ESFS scores. Driving performance tests were scheduled at either 2 PM or 3:30 PM, a time period associated with a peak for daytime sleep-related accidents. All participants completed a 20-minute warm-up at the beginning of the driving simulation task. The simulation task was designed to be monotonous, to facilitate sleepiness at the wheel. Location of the pedals as well as location and speed of the vehicle were recorded throughout the task. A potentiometer attached to the steering column allowed detailed recording of steering wheel movements. Data were then analyzed in 3 time periods: after 20 minutes, 40 minutes and 60 minutes. Three measures were obtained for each of the three time periods: standard deviation of lateral position, standard deviation of speed, and standard deviation of orientation of steering wheel (lower scores indicate better performance).

Results: Throughout the trajectory, the standard deviation of the lateral position on the road deteriorated for most participants with high scores on the fatigue scale (Manova; $F = 5.452$, $p < 0.05$). After 40 minutes, only the performance of participants with sleep apnea and high scores on the fatigue scale deteriorated significantly (Manova; $F = 3.733$, $p < 0.05$): participants with OSA who report more fatigue had significantly more difficulty maintaining the lateral position on the road. No significant differences were found for sleepiness in either group.

Conclusions: Participants reporting less fatigue appeared to have reached a plateau after 40 minutes of driving, whereas the performance of participants complaining more of fatigue continued to deteriorate. High levels of fatigue in individuals (as distinct from sleepiness) with OSA could be a risk factor for experiencing greater variations of lateral position (i.e. "weaving") on the road - a known risk for dangerous driving.

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