



Short communication

Evaluation of driving ability among residents after the duty shift

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ABSTRACT

Introduction and aims: Medical residents in training have long work shifts that lead increases the risk of traffic accidents. The Asde Driver Test is a test battery with equipment homologated by the Spanish traffic authorities designed to assess psychological and physical aptitude for obtaining the driving license in Spain. We study whether driving ability is objectively affected in this test.

Materials and methods: The Asde Driver Test was applied before and in the morning after duty. The data were evaluated using the SPSS statistical package, analyzing the variations in score with the Student *t*-test for paired samples. The results were also compared with the validated assessment criteria of the class B driving license test, based on passing of the cutoff points for each analyzed variable. Subjects with physical limitations precluding test conduction were excluded, as were those with a resting period during the duty shift of over 4 h.

Results: Of the 25 residents, 22 cases were therefore included in the data analysis. There were no significant differences in the paired global pre- and post-duty comparison of results, though there were cases in which the results obtained after duty fell short of the recommended criteria for passing the aptitude test.

Comments: The Asde Driver Test includes tests relating to anticipation speed, bimanual visual–motor coordination, multiple reaction times, concentrated attention, and resistance to monotony. The results obtained show that fatigue in some cases, though not on a generalized basis, adversely affects skills needed for driving, such as reaction time, resistance to monotony, anticipation speed, or visual–motor coordination.

In conclusion, following the resident duty shift, impaired driving ability is observed in some cases that could increase the risk of traffic accidents.

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1. Introduction and aims

Fatigue increases the risk of traffic accidents due to a slowing of reactions to stimuli (Hervás Zuriaga et al., 2011). Medical residents in training have long and intense work shifts that lead to changes in brain function (Leff et al., 2010) and increase the incidence of errors in clinical practice (Lockley et al., 2004; Niedere et al., 2003). Some studies have also reported an increase in traffic accidents after the duty shift (Barger et al., 2005; Baldwin et al., 2003). The present study examines whether driving ability is objectively affected, with a view to preventing such problems, since they imply failure to meet the minimum psychological–physical aptitude test requirements established by law in Spain.

2. Materials and methods

The study included 25 residents on duty in the Emergency Department of a District Hospital during May 2011. The Asde Driver

Test was applied on two occasions: once in the morning after having been on-duty for 24 h, and again following a period of rest of at least 7 h. In order to minimize the training effect, in 50% of the cases we performed the post-duty test first. The Asde Driver Test variables were documented, along with other information of interest such as resident age, sex, driving experience, whether the subjects drive after ending the duty shift, usual hours of sleep, and hours of sleep during the duty shift.

The data were evaluated using the SPSS statistical package, analyzing the variations in score with the Student *t*-test for paired samples. The results were also compared with the validated assessment criteria of the class B driving license test, based on passing of the cutoff points for each analyzed variable. Subjects with physical limitations precluding test conduction were excluded, as were those with a resting period during the duty shift of over 4 h.

3. Results

Of the 25 residents, one failed to complete both tests, and two were excluded because they had slept for more than 4 h. A total of 22 cases were therefore included in the data analysis. In this group the mean age was 29.6 years (SD 2.3); 81.8% were women;

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95.5% had a driving license; and 40.9% drove after coming off duty. The mean number of hours of sleep while on duty was 2.34 (SD 0.64). There were no significant differences in the paired global pre- and post-duty comparison of results, though there were cases in which the results obtained after duty fell short of the recommended criteria for passing the aptitude test: 9% in anticipation speed, 9% in multiple reaction times, 4.5% in concentrated attention, and 4.5% in resistance to monotony.

4. Comments

The Asde Driver Test (Monterde, 2005) is a test battery with equipment homologated by the Spanish traffic authorities designed to assess psychological and physical aptitude for obtaining the driving license in Spain. The battery includes tests relating to anticipation speed, bimanual visual–motor coordination, multiple reaction times, concentrated attention, and resistance to monotony. Aptitude is declared by the examiner after the global evaluation, though it is considered that the results should exceed percentile 10 in the reference tables. The Asde Driver Test has also been used to assess driving aptitude in other scenarios such as dementias (Badenes Guia, 2007).

The present study examined the impairment in driving ability after an exhausting duty shift in the Emergency Department, and which could increase the risk of traffic accidents, as has been reported in the literature (Barger et al., 2005). The results obtained were based on information on one duty shift and did not take into consideration how many consecutive days a resident had been

on duty, and show that fatigue in some cases, though not on a generalized basis, adversely affects skills needed for driving, such as reaction time, resistance to monotony, anticipation speed, or visual–motor coordination.

In conclusion, following the resident duty shift, impaired driving ability is observed in some cases that could increase the risk of traffic accidents.

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