

Driving behaviour in depressed patients vs healthy controls. Findings from a driving simulator study.

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Introduction

Depression and road accidents are among the four leading causes of morbidity and mortality in developed countries. The global prevalence of depression is 4.7% in the general population and is characterized by mental, emotional and executive dysfunction. Depression affects psychomotor and cognitive skills, while its symptoms or adverse reactions to antidepressant treatment, such as lethargy and sleep disorders, are expected also to affect both functional level and daily routine of the individual and may have an impact on driving behaviour.

Objective

The aim of the current study is to evaluate driving performance in depression on a driving simulator, taking into account levels of anxiety and sleep disturbance.

Methods

Forty patients with depression and 20 healthy controls will be finally recruited for the study. Here is presented an interim report based on the first 13 patients and 18 healthy controls. The study has two parts. In the first part, participants are interviewed by the researcher and they complete questionnaires and scales on demographics, driving experience, mental and physical health; in the second part they are evaluated for their driving on a VS500M driving simulator. Data extracted from the driving simulator include Lateral Position (LP); speed; distance from the preceding vehicle; change of steering position; and reaction time.

Table 1: Main characteristics

Participant profile		
N=31	N	%
Female	23	74,2
Married or cohabited	14	45,2
Employed	27	87,1
High education	27	87,1
Urban residents	24	77,4
Age*	46	10,23
Years of possessing a driving license*	22,77	6,37

*Mean, Standard Deviation

Table 2: Main findings from the final models of multiple backward regressions

Dependent variables	Independent variables							
	BMI ^I	HADS-D ^{II}	HADS-A ^{III}	AIS ^{IV}	AIS7-8 ^V	FSS ^{VI}	SD ^{VII}	DRUGS ^{VIII}
Number of past road accidents	$\beta=0,073$ $p=0,003$	$\beta=0,104$ $p=0,001$			$\beta=0,279$ $p=0,002$			
Aggressive driving		$\beta=-0,101$ $p=0,028$			$\beta=-0,372$ $p=0,009$	$\beta=0,040$ $p=0,002$	$\beta=0,157$ $p=0,035$	
Speed SD ¹	$\beta=0,110$ $p=0,013$			$\beta=0,183$ $p=0,021$				
Mean LP ²		$\beta=0,121$ $p=0,026$	$\beta=-0,128$ $p=0,017$		$\beta=0,298$ $p=0,041$			
Mean of distance from the preceding vehicle								$\beta=590,27$ $p=0,007$

Results

History of road accidents was associated with body mass index (BMI), depression and next-day consequences of sleep disturbance. Aggressive driving as assessed by the Driver Stress Inventory was positively correlated to fatigue and sleep disturbances and negatively correlated to depression and next-day consequences of sleep disturbance. A reduced ability to maintain constant vehicle velocity was positively correlated to BMI and insomnia. An LP towards the middle of the road was associated with anxiety. On the other hand, an LP towards the shoulder (indicating a more defensive way of driving) was associated with depression and next-day consequences of sleep disturbance, while a positive correlation was found between distance from the preceding vehicle (also an indicator of defensive driving) and use of drugs with potential hypnotic effects.

Conclusion

The findings show that depression, sleep and anxiety measures correlated with various aspects of driving behaviour. Patients may be using compensatory mechanisms to counteract some of the effects of depression and its treatment on their driving performance.

β = multiple regression coefficient

p = statistical significance

1. Standard deviation of Speed

2. Mean of Lateral Position; negative numbers: towards the middle of the road (faster lane); positive numbers: towards the shoulder (slower lane)

I. Body Mass Index

II. Hospital Anxiety and Depression Scale Depression score

III. Hospital Anxiety and Depression Scale Anxiety score

IV. Athens Insomnia Scale (total score)

V. Low functioning and somnolence (sum score of items 7 and 8 of the AIS)

VI. Fatigue Severity Scale

VII. Sleep Disturbances Questionnaire

VIII. Drugs with potential hypnotic effects