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Title: Comparing driving simulator parameters between obstructive sleep apnoea syndrome (OSAS) patients and controls in an office based advanced driving simulator (MiniSim)

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Body: Introduction- Untreated OSAS patients are at increased risk of traffic accidents. We have previously shown that controls perform better on the MiniSim than patients (failure rate-12% v/s 24%, p-0.03, OR-2.2). Task failure in patients can be identified based on standard deviation of lane position at epoch-3 (SDLP-3) and veer reaction time (Veer- RT). These parameters were further explored in controls. Methods- 178 (52+/-11 yrs, ESS 13+/-7, ODI 32+/-24) untreated OSAS patients and 96 controls (50+/-15 yrs, ESS 3+/- 2) performed a 90km motorway driving simulation. Outcome pass, indeterminate or fail, based on preset criteria, was compared between patients and controls. Results- SDLP-3 and Veer-RT were worse in the fail group. A hierarchical pattern of worsening parameters was noted both in controls and patients. On multiple comparison there was a significant difference in SDLP-3 and Veer-RT in the pass and fail group, both in controls and in untreated OSAS patients.

Driving simulator parameters in controls

Parameters (mean +/- SD)	Pass Controls(n=49)	Indeterminate Controls(n=36)	Fail Controls(n=11)	P- value (One-way ANOVA)
SDLP-3	0.37(0.1)	0.41(0.11)	0.52(0.16)	0.0016
Veer-RT (sec)	1.4(0.26)	1.6(0.34)	2.2(0.25)	< 0.0001

Drving simulator parameters in untreated OSAS patients

Parameters (mean +/-	Pass Patients	Indeterminate Patients	Fail Patients	P-value (One

SD)	(n=73)	(n=60)	(n=45)	-way ANOVA)
SDLP-3	0.37(0.09)	0.42(0.1)	0.52(0.13)	< 0.0001
Veer-RT (sec)	1.4(0.31)	1.6(0.44)	2.1(0.53)	< 0.0001

Conclusion- SDLP-3 and Veer-RT during simulated driving on an advanced simulator are objective markers of poor driving both in controls and in untreated OSAS patients.