

NOCTURNAL OXYGEN DESATURATION UND FUNCTIONAL IMPAIRMENT IN ELDERLY PATIENTS

H. Frohnhofen, N. Pfundner, and C. H. Heuer

Department of Geriatric Medicine, Kliniken Essen Mitte, Essen, Germany

Introduction: We evaluated elderly patients admitted to our department to determine the prevalence of nocturnal oxygen desaturation (OD) and to determine whether OD was associated with the functional status and functional outcome.

Methods: Patients admitted to receive special geriatric treatment because of deterioration of health status were randomly studied with overnight oximetry for arterial desaturation events, defined as a desaturation of at least 4% and a maximal duration of desaturation of one minute. The oxygen desaturation index (ODI) was calculated as the number of desaturations per hour. Furthermore patients were observed by the staff for evidence of excessive daytime sleepiness (EDS). Activities of daily living were measured by Bathel's Index (BI 0-100 points) at the time of admission and at the time of discharge.

Results: 792 randomly selected patients (30% male, 70 % female; mean age 81 ±9 yr) with dementia or stroke (33%), heart failure (25%), osteoarthritis (8%), pneumonia or chronic obstructive bronchitis (6%) or other diseases (28%), who were in a stable condition of their disease were included. The 25th, 50th and 75th percentiles of ODI were 3.9/h, 10/h and 25/h. Data are shown in the table below. There was no difference in the distribution of male and female patients between the four groups. Differences in age between the groups were very small (about 1 year) but reached significance ($P < 0.05$).

ODI n/h	<3.9	3.9-10	10-25	>25
Quatriles				
Number of patients	196	201	194	201
BI on admission	55 ±33	53 ±33	49 ±31	44 ±30**
BI on dscharge	67 ±32	66 ±29	62 ±29	55 ±30#
EDS (%)	25	32	37	51*

* $P < 0.05$ ** $P < 0.01$ # $P < 0.001$

ODI and EDS were associated with lower BI on admission and on discharge. The gain of BI decreased significantly with increasing ODI. No associations were found between ODI and age, ODI and gender, or ODI and disease admitted for.

Conclusions: More than 50% of randomly selected geriatric patients suffer from moderate to severe nocturnal oxygen desaturations (OD). Excessive daytime sleepiness (EDS) and functional impairment (FI) are important consequences of OD in these patients. EDS and FI determine the quality of live and the ability to care for oneself and may cause dependency.

Further research is needed to determine how to identify patients at risk for functional impairment, how to treat them, and whether this treatment will lead to functional improvement.