RISK FACTORS FOR NOCTURNAL OXYGEN DESATURATION IN A POPULATION OF ITALIAN TELECOMMUNICATION WORKERS

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Background: Obstructive sleep apnea (OSA) is a global health problem highly prevalent, peaking to 24% in men and 9% in women [1]. However, most cases (80%) are not diagnosed.

Aim: The present survey aimed to assess determinants of time with oxygen saturation below 90% (T90) in a population of workers.

Methods: The survey was performed on the workers of an Italian telecommunication company (TIM Group), and comprised a screening and a clinical phase. In the first phase, 6734 employees aged >50 years answered an online questionnaire, the STOP BANG TEST. Of these, 4117 (61%) performed the clinical phase, including a nocturnal polygraphy. Multivariable two-part models with a logit in the first part and a generalized linear model (GLM) with gamma distribution in the second part [2] were used to estimate the association between T90 and Body Mass Index (BMI) and smoking habits, controlling for sex and age. Interactions between risk factors and demographic variables were also tested.

Results: Overall, 4117 subjects were included in this study with a mean (±sd) age of 55.6±3.1 years (range 50.0-68.1 years) and 3237 (78.6%) of them were males. Median T90 was 0.7 minutes (p25-p75: 0-4.4) in the whole cohort and was markedly affected by BMI, and smoking habits (p<0.001). Median T90 was 0.1 minutes (0-0.7) in normal weight subjects and increased to 4.2 (0.9-13.7) and 11.9 (4.4-26.8) minutes in obese and severely obese respectively (p<0.001). T90 increased from 0.6 (0-3.7) in non-smokers to 1.8 (0.2-9.7) minutes in past smokers exposed to >15 pack-years.

In the first part model the probability to have T90>0 was higher in men than women (p=0.001), in subjects with age >60 years than ≤60 years (p=0.001), in obese (p<0.001) than normal-weight individuals and in ex-smokers than never-smokers (p<0.05). In the second part model, performed on individuals with T90>0, the results were confirmed for BMI (p<0.001), while current smokers had longer nocturnal oxygen desaturation only if the cumulative smoking exposure was larger than 15 pack-years (p=0.001). In the combined model (logit and GLM), the marginal effects consisted, as regards age, in a T90 increase of 1.7 minutes (95% CI: 0.2-3.2) in people aged 60-68 years with respect to younger people; as regards BMI, in a T90 increase of 9.45 minutes (95%CI: 7.7-11.2) in class I obese and 18.4 minutes (95%CI: 12.9-24.0) in class II/III obese with respect to normal-weight individuals. In ever smokers with cumulative smoking exposure >15 pack-years, the marginal effects consisted in additional 1.5 minutes (95%CI: 0.2-2.9) in ex-smokers and 3.2 minutes (95%CI:1.3-5.0) in current smokers with respect to never-smokers. No interactions were found between risk factors and demographic variables.

Conclusion: Obesity emerged as the main risk factor for prolonged nocturnal oxygen desaturation. Heavy smoking also had a significant, although minor, noxious effect on T90.

References

1. Peppard PE, Young T, Barnet JH, et al., Increased Prevalence of Sleep-Disordered Breathing in Adults. Am J Epidemiol. 2013;177(9):1006–1014.
2. Belloti F. twopm: two-part models. Stata J. 2015;15:3–20.