Introduction: Falling is one of the leading causes of death in those aged 60 or older. According to studies, the expenses of fall-related health care can exceed $14,000 per fall, and nocturnal hypoxemia influences the chances of this event occurring. Sleep disorders can affect bone resorption, increasing the risk of falls in older adults directly through hypoxemia, inflammation, increased sympathetic tone, changes in melatonin, and/or other hormonal factors. Studies have shown that lower testosterone levels have been associated with more sleep time with SaO2<90%; on the other hand, low testosterone has also been associated with an increased risk of falls. The objective of this study is to evaluate the association between polysomnographic variables and the risk of falls in older adults.
Materials and Methods: A search was conducted in the PubMed Central, PubMed, LILACS, SciELO, VHL, and Cochrane Library databases, using the following terms listed in the DeCS/MeSH: "accidental falls"; "elderly"; "sleep disorder". Inclusion criteria were: studies that included assessment of sleep-disordered breathing associated with falls; older adult over 65 years old; recording of oxyhemoglobin saturation. Exclusion criteria were: abstracts; congress proceedings; studies involving animals; posters; reviews; letters; symposiums.
Results: By searching the databases, 1341 articles were found, and through manual search 12 more were identified; of these, 03 met the eligibility criteria. Among the main results were: Cauley et al. showed that men with nocturnal hypoxia during sleep were also more likely to have abnormal resting SaO2 and an AHI (apnea—hypopnea index), indicating sleep-disordered breathing. The study by Onen et al. found that half of the patients analyzed had an association between nocturnal oxyhemoglobin desaturation and falls, with SaO2 values below 90% for 10% or more of the sleep time up to 36%. Two studies showed an association between nocturnal hypoxemia (≥10% of sleep time with SaO2< 90%) and an increased risk of falls. Sleep periods in which oxygen saturation (SaO2) was below 90% for 3.5-10.5% of total sleep time were found to be associated with an increased chance of at least one episode of falling. Cauley et al. pointed out that the associations between nocturnal hypoxia and falls were also independent of AHI, suggesting that intermittent nocturnal hypoxia alone increases the risk of falls. Increased sleep time with SaO2<90% was associated with a 30 to 40% increase in fracture risk (p = 0.049). Stone et al. noted that nocturnal hypoxemia is an independent risk factor for recurrent falls.
Conclusions: This systematic review highlights the significance of considering nocturnal hypoxemia as a potentially relevant risk factor for falls in patients with prolonged SaO2<90%. Studies have shown that interventions to control nocturnal hypoxia may reduce the risk of falls in older adults; therefore, it is essential to emphasize the need for randomized placebo-controlled clinical trials to confirm this hypothesis.
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NON-ABLATIVE LASER TREATMENT FOR SNORING AND OBSTRUCTIVE SLEEP APNEA - A CONTROLLED RANDOMIZED DOUBLE-BLIND CLINICAL TRIAL

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Introduction: By preventing the progression of sleep breathing disorder (SBD) , the risk of developing chronic diseases highly prevalent in society, such as hypertension and type 2 diabetes, is reduced. This study aimed to clinically evaluate the effect of non-ablative treatment with Nd:YAG (1064 nm) and Er:YAG lasers (2940 nm) in sleep breathing disorder (SBD), in a longitudinal, interventional and prospective study.
Materials and Methods: After approval from the Research Ethics Committee (CEP FOUSP CAAE: 44068621.8.0000.0075) and clinical trial registration - WHO - Rebec UTN code: U1111-1284-3764, thirty volunteers, in the city of São Paulo, Brazil, with clinical status from snoring to moderate OSA, both sexes, 25 to 65 years old, BMI < 40kg/m^2 were blinded and randomized in control and laser groups. Patients received three treatment sessions, 14 days apart. In the control group (12 volunteers), only a guide light was used without delivering laser energy. 18 volunteers of laser group were treated with non-ablative high-intensity irradiation with the association of Nd:YAG and Er:YAG lasers. Entire soft palate, uvula, palatoglossal and palatopharyngeal arches were punctually irradiated with four to five shoots per point and six scans in each line. Parameters were selected to deliver energy efficiently and safely in a five-step sequence wich enable tissue thermal sensitization, gradually. Outcome measures were performed before, after treatment and at three and six months follow up visits, including photographic record, type IV polysomnography and analysis of snoring noise. The main outcome of the study, analysis of the upper airway lumen variation according to the Modified Mallampati Index was performed independently and blinded and as well as the statical analysis. Oxyhemoglobin desaturation index (ODI), snoring time during sleep and peak amplitude of snoring noise were also analysed. Observation of the variability of each outcome allowed analysis of the differences between experimental periods compared to baseline for each variable and the behavior of the laser group compared to the control group. Fisher's corrected chi-square test with a significance level of $\alpha = 5\%$ was applied.
Results: The main clinical outcome is the expansion of the upper airway lumen, in all study periods analyzed after irradiation [variation between control and laser groups: (0.0 ± 0.0); (-25.0 ± 50.0) with p = 0.00060]. Therefore, improvement in ODI [variation between control and laser groups: (19.6 ± 67.6); (-18.1 ± 88.2) with p = 0.018]; improvement in snoring time (64.8 ± 179.1); (-1.5 ± 85.0) with p = 0.034 and in snoring noise peak amplitude (-8.3 ± 12.3); (-12.4 ± 15.8) with p = 0.029. No major adverse events or side effects were observed.
Conclusion: Non-ablative laser treatment is effective in rehabilitation of patients with Sleep Breathing Disorder. In the protocol used in this study, the procedure is performed in outpatiente basis, without medication or anesthesia. Increasing the lumen of the upper airway by decreasing tissue flaccidity, leads to the improvement of oxyhemoglobin desaturation index (ODI), snoring time during sleep and peak amplitude of snoring noise.
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OBESITY HYPOVENTILATION SYNDROME PREVALENCE AND ITS IMPACT IN SLEEP OXYGEN SATURATION IN 3 CITIES LOCATED AT DIFFERENT ALTITUDES

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Introduction: Obesity is related with comorbidities such as Obesity Hypoventilation Syndrome (OHS) which increases morbidity and mortality. There is no data that compares prevalence of OHS and its impact in oxygen saturation during sleep at different altitudes. The aim of the study was to establish the prevalence of OHS in adults inhabiting 3 Colombian cities located at different altitudes.
Materials and methods: Cross sectional, observational, analytic study in adults (BMI ≥30 Kg/m^2), who were referred for polysomnography in 3 sleep centers in 3 cities located at different altitudes (Bogotá: 2640 m.a.s.l., Medellín (1538 m.a.s.l.) and Bucaramanga (959 m.a.s.l.). Patients with other causes of hypoventilation were excluded. Patients underwent clinical evaluation, polysomnography, arterial blood gases and spirometry. Hypoventilation was defined differently within each city: $PaCO_2$: Bucaramanga ≥41 mmHg, Medellín ≥40 mmHg and Bogotá ≥ 38 mmHg. To determine the differences between cities, the continuous variables with and without OHS were analyzed with ANOVA or Kruskal-Wallis and the qualitative variables with Chi^2. SPSS version 25.
Results: 183 participants were included (Bucaramanga: 68, Medellín: 55 and Bogotá: 60). 62,8% were women, without differences by city (p=0,610s). The prevalence of OHS was: 10,4% (Bucaramanga: 8,8%, Medellín: 7,3%, Bogotá: 15%; p=0,346); 93,4% had sleep apnea (AHI≥5/h) (p=0,580). Patients with OHS had lower SpO_2 in both NREM and REM. Higher the altitude, lower SpO2 during sleep (Table and Figure 1).