Three dimensional analysis of patients with obstructive sleep apnea using cone beam

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ABSTRACT

Introduction and aim: Our aim was to assess the role of craniofacial bones and soft tissues in obstructive sleep apnea (OSA) in relation to height, obesity, age and gender.

Materials and methods: From April 2014 to December 2014, 154 subjects with sleep complaints underwent a polysomnography and a craniofacial cone beam computed tomography (CBCT). Twenty-seven subjects had no significant OSA, as their AHI (apnea and hypopnea index) and ODI (oxygen desaturation index) were lower than 10/h. One hundred and seventy-seven patients suffered from OSA (AHI $\geq$ 10 and ODI $\geq$ 10). Craniofacial and upper airway structures were compared between OSA patients and normal subjects, and according to OSA severity within the cohort and between the two genders.

Results*:* OSA patients demonstrated a narrower maxillo-palatine core volume (11.7±3.2 vs 14.6±4.9cm^3), even when adjusting for age, gender, height, neck circumference and body mass index. Soft tissues thickness was a marker for OSA severity. Maxillary and mandibular volumes were significantly smaller in severe cases for men only.

Conclusions: These upper airway measures provide a comprehensive analysis of bony structures and soft tissues, which can be involved in OSA. The maxillary bone volume was constantly tighter in the OSA group, while soft tissues were related to OSA severity. Severity factors were different between men and women.