Respiratory infections

0073
Analysis of selected skeletal elements of the nasal cavity in ancient populations and predispositions for respiratory tract infections.

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Background: Nasal congestion impairs the natural protective function of this area and predisposes to respiratory infections such as acute rhinitis, pharyngitis, laryngitis, bronchitis or pneumonia. Nasal obstruction usually concerns soft and hard tissues within the nasal cavity. The evaluation of nasal cavity patency in old/past populations is based solely on the nasal skeleton analysis, and the most important /critical elements are nasal septum and nasal turbinates.

Objective: The aim of the study is to evaluate the occurrence of nasal deviation (bony part), including type of deviation, the presence of concha bullosa and their influence on nasal congestion in individuals living in Cracow from the 16th to 19th centuries and in individuals living in Szczecin in the early 20th century. In addition, the purpose of this work is to asses a predisposition of these populations for respiratory infections such as sinusitis.

Material and methods: The analysis included 154 skulls of individuals (35 women and 119 men, mean age 41.78) originating from Cracow (16th-19th centuries) and from Szczecin (beginning of 20th century). Nasal cavity was evaluated macroscopically and on the basis of radiological examinations. The nasal septum deviations were systematized according to the classification used in reconstructive and aesthetic surgery (6 types). The presence of concha bullosa was also assessed. Pearson correlation coefficient was used to analyze whether there was a statistically significant change. All tests employed a $P \leq 0.05$ level of statistical significance. All principal components were compared to the type and percentage of septum deviation.

Results: Nasal septum deviation was present in 77% of examined skulls and concha bullosa - 34% (macroscopic examination and CT). In the skulls from Kraków, the majority of C-type were found in both men and women (51%). S-type was identified in 23% of skulls (predomination in male skulls). A significant incidence of nasal obstruction and paranasal sinusitis was reported in the analyzed cranial series. There was a relationship between occurrence of concha bullosa on one side and a deviation on the other side. There was a higher incidence of maxillary sinusitis in the skulls with deviation of the nasal septum type IV and V ($p = 0.006$). Regression analysis of NSD type, concha bullosa and massive unilateral bone spur occurrence ($B = 0.43$, $p = 0.035$) were used to explain the prevalence of the nasal obstruction and maxillary sinusitis in individuals in the past population

Conclusions.

The results of studies concerning the anatomical variants of the nasal cavity may help in determining the incidence of disturbed airflow in the upper respiratory tract and as a consequence infections of the respiratory tract in historical populations.