ORO-DENTAL PATHOLOGY – CHRONIC RESPIRATORY DISEASES CORRELATIONS

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Abstract

One of the most common chronic respiratory diseases, incapacitating the development and quality of life of patients and directly correlated with oro-dental cavity is represented by asthma, a chronic inflammatory disease affecting the airways, in which mast cells, eosinophils and T lymphocytes play an important role. A better understanding of the diagnosis and treatment of asthma became possible by accepting that the existence of chronic inflammation, with its variations, is reflected in the clinical condition of the patient, with implications on the dental status.

Scope of the study: Determination of the prevalence and severity of oro-dental pathology in patients with chronic respiratory diseases, namely of individualized regimens, according to associated comorbidities that would contribute to improving the quality of life.

Materials and method: A study was conducted on a group of 167 patients hospitalized in the Vth Internal Medicine and Geriatrics - Gerontology Clinic, CF Hospital of Iaşi, along one year (2011-2012) and also on 53 patients consulted in a dental ambulatory unit.

Results and discussion: The investigations conducted in the Vth Medical and Geriatrics - Gerontology Clinic, respectively in the Ambulatory of University Dental Polyclinic, showed an increased prevalence of gingivitis, chronic marginal superficial periodontitis, coated tongue, possibly caused by insufficient ventilation in the nose and mouth breathing predominance. Angular cheilitis and stomatitis have been also had in view, as diseases of the oral cavity, in patients with asthma and chronically obstructive pulmonary diseases (COPD). Such cases were more frequent in male than in female patients, a possible explanation being the higher prevalence of smoking and increased exposure to professional allergens for males, as well as a higher incidence of viral and / or bacterial superinfections.

Conclusions: Over 41.1% of the patients with chronic respiratory diseases and COPD AB present angular cheilitis (11.6% cases), stomatitis (22.3% cases) and candidosis (11.2% cases). In the experimental group, the level of oral hygiene is more satisfactory in women than in men, the same ratio being registered for smoker and nonsmoker patients.

Also, caries occur more frequently in men than in women, the causes being, once again, health education, oral hygiene status and smoking.

1. GENERAL CONSIDERATIONS

Respiratory pathology is more frequently present in susceptible patients, in such cases infection/inflammation causing recurrent episodes of wheezing, dyspnea (shortness of air) in varying degrees, chest tightness and irritating cough, especially at night and in the morning. These symptoms are associated with sliding and also with the variable, yet relative and frequently generalized restriction of the air flow, seen as reversible (even if only partially), either spontaneously or as a result of the treatment. Inflammation also causes an increased bronchial reactivity to a variety of stimuli [1,2].

Therefore, asthma appears as caused by pathological changes in the airways and by their functional consequences. A better understanding of the diagnosis and treatment of asthma was possible once accepting that the existence of chronic inflammation, with its variations, is reflected in the clinical condition of the patient [3,4]. Due to the existence of still non-invasive, well-validated methods for measuring bronchial inflammation, both clinicians and epidemiologists should rely on “surrogate” indices.

Inflammation causes increased airway responsiveness to stimuli such as allergens, irritants, chemicals, cigarette smoke, cold air, exercise, etc. Exposure to these stimuli causes airway mucosal edema, bronchoconstriction, mucus plugs and airway responsiveness to various stimuli [5]. The result of respiratory flow limitation is reversible (but not always complete), either spontaneously or as a result of treatment.
Systemic inflammation correlates frequently with numerous other sites, including the orodental diseases - the main causes of the stomatognatic system, modifying swallowing and reducing the quality of life [6].

Contributing to a better understanding of this association with the potential of reducing COPD incidence through treatment of the periodontal diseases, known as having important public health and clinical implications, the present study analyzes the effects of the periodontal diseases and systemic biomarkers of inflammation on the occurrence of serious fatal and non-fatal respiratory-related events among COPD subjects [7].

Commonly, periodontitis is considered a constant potential source of infection and a serious risk factor for some cardiovascular, respiratory, endocrine, musculo-skeletal, and reproductive system-related abnormalities [8,9]. Oral health impacts on the general well-being and, if comprehensive health care is ever to be achieved, oral health should not be seen as a separate, distant and less important area of interest, totally unrelated to lifespan and its quality.

The tendency of both medical and dental specialists is to approach patient’s management from regional rather than systemic points of view. In the light of the ever-increasing role of oral infections, such as periodontal diseases, a literature review on the topic becomes necessary [10] for providing comprehensive, easily-available information, for drawing the attention of health practitioners upon the impact of oral health and general well-being of patients and for emphasizing the need of a closer interaction between medical and dental trainings [11].

2. MATERIALS AND METHOD

To highlight the opportunity, precocity and chronic respiratory effects of oral pathology with reference to asthma and chronic obstructive pulmonary diseases (COPD), a prospective study was conducted on a group of 167 patients hospitalized in the Internal Medicine and Geriatrics - Gerontology Clinic of the CF Hospital Iași, between 2011 and 2012, and also on 53 patients consulted in a dental office. Two aspects have been mainly considered, namely:

- Frequency of dental/oral cavities in patients with chronic respiratory diseases, focusing on the impact of asthma and COPD, since – potentially - all of them will be undergoing dental treatment that can pose risks.
- Frequency of acute respiratory accidents in dental offices, their consequences and establishment of treatment principles specific to each patient.

3. RESULTS AND DISCUSSION

Distribution by sex and age of patients in both groups showed a slightly higher prevalence of males (M/W ratio = 1.3/1), but with a more uniform distribution on age groups (fig. I and table I).

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Chronic bronchitis</th>
<th>Emphysema</th>
<th>Asthma</th>
<th>COPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 40 years</td>
<td>2 patients</td>
<td>11 patients</td>
<td>6 patients</td>
<td>6 patients</td>
</tr>
<tr>
<td>40-50 years</td>
<td>6 patients</td>
<td>3 patients</td>
<td>17 patients</td>
<td>12 patients</td>
</tr>
<tr>
<td>50-65 years</td>
<td>15 patients</td>
<td>6 patients</td>
<td>38 patients</td>
<td>34 patients</td>
</tr>
<tr>
<td>&gt; 65 years</td>
<td>3 patients</td>
<td>1 patient</td>
<td>9 patients</td>
<td>8 patients</td>
</tr>
</tbody>
</table>

Table I - Distribution of patients by age and disease
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Fig. I - Distribution of patients by age and disease

Approximately 40% of the patients (67 cases) were discovered accidentally by family doctors or during examination in the ambulatory of the CF Clinic Hospital, investigations and specialized treatment being recommended. Statistically, distribution by sex and condition of the control group in outpatients with chronic respiratory diseases was relatively uniform.

Other issues investigated in the study were the risk factors for chronic respiratory diseases, first of all smoking (fig. II), exposure to allergens, the most common being the criminalized domestic and digestive ones, followed by atmospheric and professional conditions, as well as a relatively high ratio of respiratory viral and/or bacterial infections, gastrointestinal reflux - the esophagus diseases being frequently involved in a population segment over 60-65 years - and use of anti-inflammatory drugs (NSAID) for osteoarticular suffering.

Fig. II - Distribution of smokers and non-smokers in the experimental group

The following investigations referred to diseases of the oral cavity in patients with chronic respiratory pathology, taking into account the indications of oral hygiene, mainly:

I. Gingival indices:
- Simplified gingival index (Lindhe, 1983) corresponding to the gingival bleeding index/SBI - Bleeding sulcular index (Ainamo and Bay, 1975) [12,13];
- Gingival Index (Loe and Silness, 1963);
- Papillary bleeding index (PBI) - Papillary Bleeding Index (Saxer and Mühlemann, 1975) [14, 15].

II. Indices of periodontal inflammation:
- Periodontal Index (PDI) Ramfjord;
- Gum analysis;
- Periodontium analysis
- Tooth mobility index [16].

III. Community Periodontal Index of Treatment Needs (CPITN), assessing:
- Presence or absence of gingival bleeding;
- Presence or absence of subgingival or supra- gingival plaque;
- Presence or absence of periodontal pockets [17].

The investigations, conducted in the Vth Medical and Geriatrics - Gerontology Clinic, respectively in the Ambulatory of University Dental Polyclinic, showed increased prevalence of gingivitis, periodontitis, chronic marginal superficial, coated tongue, possibly caused by insufficient ventilation in the nose and mouth breathing predominance [18]. Angular cheilitis and stomatitis have been also considered as diseases of the oral cavity in patients with asthma and COPD (fig. III). A higher frequency of such cases was recorded in males, comparatively with females, a possible explanation being the increased prevalence of smoking and a higher professional exposure to allergens of males, respectively, along with an increased incidence of viral and/or bacterial superinfecting.

Fig. III - Incidence of dental pathology in the experimental and control group

In these cases, 56.4% (124 patients) of the subjects with chronic respiratory diseases were diagnosed with superficial chronic periodontitis,
respectively chronic bronchitis - 18 cases (14.2%); asthma - 66 cases (53.4%); emphysema - 6 cases (5.1%); COPD - 34 cases (27.3%), the degree of impairment of periodontitis being determined more by the severity of the respiratory disease than by its duration (table II). Another frequent dental pathology is gingivitis, present in 36.5% (80 patients) of the cases of chronic respiratory disease, respectively: chronic bronchitis 14 cases (17.1%); asthma - 39 cases (49.1%); emphysema - 8 cases (9.4%); COPD - 20 cases (24.4%).

<table>
<thead>
<tr>
<th>ORO-DENTAL LESIONS</th>
<th>Patients</th>
<th>Prevalence</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHRONIC GINGIVITIS</td>
<td>22 p</td>
<td>20%</td>
<td>9 p</td>
<td>30%</td>
</tr>
<tr>
<td>SUPERFICIAL CHRONIC PERIODONTITIS</td>
<td>37 p</td>
<td>40%</td>
<td>25 p</td>
<td>40%</td>
</tr>
<tr>
<td>COATED TONGUE</td>
<td>23 p</td>
<td>12%</td>
<td>9 p</td>
<td>33.3%</td>
</tr>
<tr>
<td>ANGULAR CHEILITIS</td>
<td>7 p</td>
<td>10%</td>
<td>2 p</td>
<td>40%</td>
</tr>
<tr>
<td>STOMATITIS</td>
<td>5 p</td>
<td>12%</td>
<td>2 p</td>
<td>33.3%</td>
</tr>
<tr>
<td>ORAL CANDIDOSIS</td>
<td>3 p</td>
<td>6%</td>
<td>1 p</td>
<td>33.3%</td>
</tr>
</tbody>
</table>

Table II - Incidence of oral pathology in patients with asthma and COPD

Also compared in patients with asthma and COPD was the incidence of caries lesions of periodontal type, a growing prevalence (49.3% cases) of these disorders being registered in women, the most common being asthma patients, while in those with chronic obstructive pulmonary diseases, untreated odonto-periodontal suffering prevailed in males (53.5% cases).

4. CONCLUSIONS

Asthma and chronic respiratory pathology is generally an inflammatory disease with multiple implications in dental pathology, thus requiring a precise diagnostic and well-established therapeutic protocol [19]. Asthma therapy involves a series of features: • specific; • characteristic to each and every patient in part; • subordinated to the pathogenic factors (bronchial inflammation = physiopathological therapy). The first line therapy to be applied involves inhalation of glucocorticosteroids [20]. The therapeutical consequences are reflected first in the oro-dental condition, inducing pathological transformations of various types and, consequently, improved quality of the primary digestive function and metabolic alterations [21,22].

Statistical analysis shows that over 60% (176 patients) of the subjects with chronic respiratory diseases were diagnosed with superficial chronic periodontitis: • Chronic bronchitis - 25 cases (14.2%); • Asthma - 94 cases (53.4%); • Emphysema - 9 cases (5.1%); • COPD - 48 cases (27.3%), the degree of periodontitis impairment being caused by the severity of the respiratory disease rather than by patient’s age.

Also, 6.5% (117 patients) of the subjects with chronic respiratory diseases had chronic gingivitis: • Chronic bronchitis - 20 cases (17.1%); • Asthma - 61 cases (57.3%); • Emphysema - 11 cases (9.4%); • COPD - 25 cases (24.4%). 7.1% of the patients (19 subjects) with chronic respiratory diseases, COPD and asthma presented angular cheilitis (3.6% cases), stomatitis (2.3% cases) and candidosis (1.2% cases).

The level of oral hygiene in the experimental group is more satisfactory in women than in men, the same ratio being recorded for smoker and non-smoker patients.

Dental caries occur more frequently in men than in women, evidencing the extent of damage caused by their education, oral hygiene, smoking habits.

In conclusion, in chronic respiratory diseases, usually in asthma (58.3%) and COPD (39.2%) cases, patients have frequently inhaled corticosteroids, which increases the aggressiveness of oral microbial flora and decreases local and systemic immunity, favourizing the odonto-periodontal disease and vicious and reduced digestive function, with important consequences on the quality of life.

Dental professionals should be familiar with the manifestation of these diseases, for providing effective and specialized treatments, and also for preventing any possible oral and dental manifestations.
References


