EPILEPSY-RISK FACTOR FOR THE PERIODONTAL DISEASE
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ABSTRACT
Introduction The epilepsy patients are affected not only by the medical aspects of the disease but also by adjacent aspects of psychosocial and economic nature, with important implications on the quality of life on epilepsy subjects. Aim of the study The purpose of the study was to make an evidence on the differences between non-epileptic and epileptic patients concerning the oral health, insisting on the odontal-periodontal status. Materials and methods The study was conducted on 202 subjects divided in two groups-101 subjects with epilepsy, 101 without epilepsy on which we realized a thorough anamnesis (with data of associated drugs, oral hygiene-the brushing frequency, dental visits and dental prosthetic treatments) and a clinical examination. Results The patients without a controlled disease, with frequent, generalized episodes, present an improper oral status comparing to those in the control group. We did not notice secondary effects related to the phenytoin medication. Conclusions Our study demonstrates that the epileptic patients present a critical oral health comparing to the non-epileptic patients.

Keywords epileptic patients, oral health, periodontal status

INTRODUCTION
The epilepsy disease is characterised by a high variability of seizures, onset age, aetiology, symptomatology, severity, prognostic and, mainly, of therapeutic approach.

Therefore, the pathology is impressive by its diversity and, especially, by the dramatic effects on the patients who perceive this disease as a handicap. Furthermore, the secondary and adverse effects of the anti-epileptic drugs (AED) present a high incidence, being sometimes life-threatening. More than 61% of the patients that receive conventional AED (like phenytoin, carbamazepine, valproic acid or phenobarbital) present adverse reactions, contributing to the initial abandonment of the treatment in 40% of the cases [1, 2, 3].

Because of the similarity of the therapeutical efficiency of a certain type of seizure, the general adverse effects of the drugs become the most important criterion in choosing the anti-epileptic drug. Oral pathological alterations represent an important adverse reaction of the AED, such as gingival enlargements, xerostomia, glositis, stomatitis, ulcerations, slow tissue regeneration, post-surgical gingival bleeding etc.

The epilepsy patients are affected not only by the medical aspects of the disease but also by adjacent aspects of psychosocial and economic nature, with important implications on the quality of life on epilepsy subjects.
The quality of life represents an important issue that globally concerns the scientists’ world: sociologists, doctors etc.; its improvement indicates a proper economic and health policy, particularly, an efficient therapy [4, 5].

Aim of the study

We proposed a study to point out the possible differences between the epileptic and non-epileptic patients, concerning the oral health, insisting on the odontal-periodontal status.

The statistical study will distinguish the differences in oral health between the two groups of subjects and, if these differences exist, what measures can be addressed in order to improve the oral health status.

MATERIALS AND METHOD

The study was conducted in the Neurology Clinic of the Faculty of Dental Medicine Iași, in collaboration with the Periodontology Clinic of the Faculty of Dental Medicine in „Gr. T. Popa” University Iași. The 101 subjects of the test group are patients of the Neurology Clinic. The 101 subjects of the control group are selected from the hospital triage, with the age accordingly to the ones in the test group.

The group included 57 male patients and 44 female patients.

Anamnesis-questionnaire

The first step of the research consisted in dividing the patients in the established groups, based on the clinical chart and anamnesis conducted by the neurology specialist (Table 1). Subsequently, the dental specialist conducted the anamnesis, regarding the associated drugs, oral hygiene—the brushing frequency, dental visits and dental prosthetic treatments.

Oral clinical evaluation

The criteria in establishing an oral health level were the ones recommended by the World Health Organisation.

The indices used in our study were:
- Greene-Vermillon Oral Hygiene Index (oral hygiene)
- DMF-T Index (present teeth-caries, absent, fillings)
- Abrasion Index (dental abrasion index)
- CPITN Index (periodontal status)
- Gingival attachment loss
- Gingival enlargement
- Mühlemann Index (gingival bleeding)
- Prosthetic Index (dental prosthetics—type, material)

For data processing we used Microsoft Excel analysis software and Statistics 6.0.

We divided the subjects in two groups, regarding the fact that the purpose of the study was to establish direct correlations between epilepsy (the systemic risk factor), different drugs of the anti-epileptic therapy and oral alterations, eliminating all the variables that can influence the results:
- A test group (epileptic patients in the Neurology Clinic of No. 3 Neurosurgery Hospital in Tâțărași)
- A control group (non-epileptic patients in the Periodontology Department), with similar age characteristics as the test group.

All the patients, including the subjects in the control group, were examined by a sole neurology specialist and a sole dental specialist, to exclude any investigation errors. The clinical examination revealed epilepsy-related gingival and periodontal alterations (Fig. 1, 2).

RESULTS AND DISCUSSIONS

Considering that the aim of the study was to establish direct correlations between epilepsy (the systemic risk factor), different drugs of the anti-epileptic therapy and oral alterations, eliminating all the variables that can influence the results, the subjects were divided in two groups: a test group and a control group, with similar age characteristics (Fig. 3, 4).

Therefore, the mean age for the epileptic group was 37.34 ± 14.9 years and the mean age for the control group was 37.86 ± 15.8 years.
Group I
- Patients without seizures in the last years, with or without medication
- Patients with rare seizures (less than 1 per year)
- Patients with seizures that don’t involve the masticatory system (absence, myoclonic and certain partial seizures)

Group II
- Patients with frequent partial seizures that involve the masticatory system, with clonic movements of facial and manducatory muscles, oral automatisms (bruxism)

Group III
- Patients with frequent generalized tonic-clonic seizures

Group IV
- Patients with neuro-psychic disabilities that exclude the cooperation during the dental treatment

Table 1. The classification of the subjects according to the disease characteristics

- **Fig. 1.** Patient F.T., 61 years old, high blood pressure - gingival enlargement due to anti-epileptic drugs (Periodontology Department)

- **Fig. 2.** Patient B.N., 39 years old, from Grajduri gingival enlargement due to anti-epileptic drugs (Periodontology Department)

- **Fig. 3.** Addressability degree to dental services (p<0.001)

- **Fig. 4.** Age distribution

The subjects’ drugs distribution was as follows:
- 66% valproic acid
- 50% carbamazepine
- 100% of the rest, except the ones with lamotrigine

At the time of the study only one patient took phenytoin and 35 of the subjects have taken phenytoin more than a year ago (Fig. 5).

The gingival attachment loss is significantly higher for the epileptic patients (p=0.008).

The statistical significance of Group II to Group III comparison is p<0.001.

DMF-T Index and Gingival Bleeding Index prove significant differences between the disease groups (Fig. 6, 7).

Greene-Vermillion Index is significantly lower for the epileptic patients.

Drug-induced gingival enlargement was present only on few subjects in the test group, statistically insignificant.

The periodontal lesions had a bacterial aetiology and, due to the possibility of
cooperation with the subjects, hygiene measures and treatments contributed to the diminishing/elimination of the inflammation (Table II).

CPITN Index and gingival attachment loss were also significantly higher on epileptic patients.

**Table II. Oral Hygiene Index (Greene-Vermillon)**

<table>
<thead>
<tr>
<th>GROUP</th>
<th>Mean value ±DS</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epileptic patients</td>
<td>3.18±1.15</td>
<td>p&gt;0.5</td>
</tr>
<tr>
<td>Control Group</td>
<td>2.81±1.14</td>
<td></td>
</tr>
<tr>
<td>Group III</td>
<td>3.72±0.94</td>
<td>p=0.033</td>
</tr>
</tbody>
</table>

**Table III. Clinical and biological odontal-periodontal indices (DMF-T, CPITN, attachment loss)**

<table>
<thead>
<tr>
<th>GROUP</th>
<th>Carious teeth</th>
<th>Missing teeth</th>
<th>Fillings</th>
<th>CPITN</th>
<th>Gingival attachment loss</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Media ±DS</td>
<td>Media ±DS</td>
<td>Media ±DS</td>
<td>Media ±DS</td>
<td>Media ±DS</td>
</tr>
<tr>
<td>Epileptic patients</td>
<td>6.73±4.37</td>
<td>9.46±9.38</td>
<td>1.69±2.57</td>
<td>2.6±0.69</td>
<td>1.47±1.11</td>
</tr>
<tr>
<td>Control group</td>
<td>3.71±3.53</td>
<td>6.63±7.89</td>
<td>3.37±3.75</td>
<td>2.4±0.76</td>
<td>2±1.53</td>
</tr>
</tbody>
</table>
epilepsy or with seizures that don’t affect the masticatory system or than the control group subjects [9].

All of this is consequent to the combined effects of oral health neglecting, oral lesions and occlusal trauma. Furthermore, uncontrolled epilepsy patients, with frequent generalized tonic-clonic seizures, present a poor oral health, compared to the patient with controlled seizures or with seizures that don’t affect the masticatory system. Additionally, this group of patients presents a lower rate of dental prosthetics, indicating an incorrect and insufficient therapy.

The most frequent secondary effect of AED consists in phenytoin-induced gingival enlargement. The changes appear after 1-2 years of intake and disappear after a few months of drug cessation. Phenytoin medication was replaced by carbamazepine and valproic acid medication and, recently, by levetiracetam, an almost miraculous drug by its efficiency and very few secondary effects.

Our study observed only 2 cases of phenytoin medication, without any adverse effects. Nowadays, the anti-epileptic drugs have very few oral adverse reactions. Certain studies have reported carbamazepine as inducing xerostomia and stomatitis.

In our study we couldn’t establish a statistical significant relation between the oral manifestations and anti-epileptic drugs. The periodontal lesions are unlikely determined by AED.

**CONCLUSIONS**

Our study demonstrates that the epileptic patients present a critical oral health comparing to the non-epileptic patients. The modifications are directly related as magnitude to the disease group, maintaining the value of epileptic status as a risk factor for the disease severity.

**REFERENCES**