



## Epileptic Patients in Dentistry – A Challenge

(Review Article)

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### Abstract

*Epilepsy, which is characterized by the risk of recurrent seizures, is a chronic disease. Dentists with a thorough knowledge of seizure disorders and the medications used to treat them can provide necessary dental and oral health care to these patients. In this review, we summarize current knowledge of epilepsy, seizures and antiepileptic drugs and provide information on dental-related issues, as well as guidelines for the management of an acute seizure in the dental office.*

**Keywords:** *Epilepsy, Dental, Seizure, Prosthodontic Treatment*

### Introduction

Epilepsy is the most common chronic neurologic disorder in paediatric neurology and the predominant aetiologies are birth injury and congenital abnormalities. Epilepsy has a tendency to recurrent seizures.

According to the World Health Organization, disability due to epilepsy accounts for about 1% of the global burden of disease, as measured by disability-adjusted life-years, ranking it just after some psychiatric problems such as alcohol dependence. The global burden of epilepsy is comparable to that of breast or lung cancer.<sup>1</sup>

The human brain consists of millions of neurons, their extensions, and the supportive tissues found between those neurons. All brain cells have the ability to produce electrical currents and conduct them to other cells. It is by transmitting such

electrical signals that the brain functions. In other words, it is the conduction of these electrical currents that enables us to act, to speak and to feel.<sup>1, 2</sup>

Understanding epilepsy and seizures raises awareness of the disorder's impact on a patient's general medical and psychological health. Dental treatment of patients with epilepsy and seizures should be carried out by dentists who are knowledgeable about these disorders.

### Epidemiology and Prevalence

Epilepsy is a disease that is frequently encountered by oral and maxillofacial surgery practices. It is thought to affect millions of people worldwide, and has a prevalence of 0.5% - 0.9% in the general population.<sup>1,2,3,4</sup> Chapman *et al.* have reported that, epileptic seizures are the

second most common medical incident in dental surgeries. They have stated that statistically every dentist notice in his/her professional life 1.5 times generalized tonic-clonic seizures by the patients.<sup>5</sup> It has been reported that the disease occurs independent of race, age and gender.<sup>2</sup> However, epilepsy has been occur more frequently in men than in women.<sup>6</sup>

### **Etiology**

In 70% of epilepsy cases, the specific etiology is not known for certain. These cases are defined as idiopathic or primary epilepsy. When the etiology of seizures is known, the condition is known as secondary or acquired epilepsy.<sup>6,7</sup> Other causes of epilepsy are cerebral vascular mal-formations, brain tumors and hamartomas, hypoxic- ischemic lesions, head traumas, birth traumas, infections affecting babies during pregnancy, inflammatory diseases and infectious diseases.<sup>3</sup>

### **Treating Dental Patients with Epilepsy**

#### **General Situation**

The medical literature contains little information on the influence of epilepsy in dental care. Most existing studies focus on phenytoin-induced gingival hyperplasia. Patients living with epilepsy have special needs during dental treatment. In almost all aspects of oral health and dental status, the condition of patients with epilepsy is significantly worse than age-matched groups in the general (nonepileptic) population. Furthermore, patients who have poorly controlled epilepsy and experience frequent generalized tonic-clonic seizures exhibit worse oral health in comparison with patients who are better controlled or only have seizures that do not involve the masticatory apparatus.<sup>8</sup>

The number of decayed and missing teeth, the degree of abrasion and periodontal indexes are significantly worse in patients with epilepsy. Those with epilepsy also have significantly fewer restored and replaced teeth than the general population.<sup>9</sup>

### **Inconvenience that a Dentist May come across Prosthetic Problems**

In a recent analysis of the prosthetic status of patients with epilepsy,<sup>10</sup> it was found that compared with age-matched controls, patients with epilepsy have a tendency to become edentulous earlier. It was also found that prosthetic treatment is suboptimal, as significantly fewer teeth are replaced, despite the fact that epileptic patients tend to have more missing teeth. Based on these findings, the authors suggested a classification for patients with epilepsy according to dental risk factors and dental manageability and provided recommendations for dental treatment.

Specific guidelines were also provided, such as discouragement of incisal restorations, use of fixed rather than removable prostheses and inclusion of additional abutments if fixed partial dentures are to be used. In addition, the use of metal base for complete dentures and telescopic retention with denture bases made of metal or reinforced with metal for nearly edentulous patients was recommended for those with frequent partial seizures involving the masticatory apparatus, frequent generalized tonic-clonic seizures and other seizures associated with falls.

### **Periodontal Problems**

Gingival overgrowth as a complication of phenytoin use has been well studied. About 50% of patients taking this medication will develop gingival hyperplasia within 12–24 months of initiation of treatment. Despite the existence of newer medications that are equally effective and have fewer side effects, phenytoin remains one of the most commonly used drugs. Evidence regarding best treatment for gingival hyperplasia is lacking. Some clinicians advocate the use of chlorhexidine, folic acid rinses or both, but excellent oral hygiene will probably prevent or significantly decrease the severity of the condition. In severe cases, surgical reduction is needed.

### Trauma

Generalized tonic-clonic seizures often cause minor oral injuries, such as tongue biting,<sup>16</sup> but also frequently lead to tooth injuries<sup>17</sup> and in some cases to maxillofacial trauma.<sup>10</sup>

Patients with epilepsy can be at increased risk of fracture because enzyme-inducing antiepileptic drugs (e.g., phenytoin, phenobarbital, carbamazepine) alter the metabolism and clearance of vitamin D and have been associated with osteopenia and osteomalacia.<sup>11</sup> Of interest, increased fracture risk has also been associated with the use of benzodiazepines, antidepressants and antipsychotics, suggesting that underlying brain disease or adverse effects of the medication are responsible for falls and injuries.<sup>11</sup>

### Drug Interactions

A number of drugs prescribed by dentists can jeopardize seizure control because they interact with anti-epileptic drugs. For instance, metronidazole, antifungal agents (such as fluconazole) and antibiotics (such as erythromycin) may interfere with the metabolism of certain antiepileptic drugs.<sup>12</sup>

The coadministration of fluconazole and phenytoin is associated with a clinically significant increase in phenytoin plasma concentration, and the dose of the latter may require adjustment to maintain safe therapeutic concentrations. Other anticonvulsants, such as vigabatrin, lamotrigine, levetiracetam, oxcarbazepine and gabapentin, are unlikely to interact with fluconazole.

### Conclusions

The oral conditions observed demonstrate the need for dentists to follow up and treat these patients. In addition, there is an ongoing need to improve the oral hygiene of these individuals to prevent the development of periodontal and dental disease in later life. Advances in diagnostic technology, pharmacotherapy and understanding of neurologic processes allow dentists to understand and manage patients with epilepsy

better. People with epilepsy can be safely treated in a general dental practice.

A thorough medical history should be taken and updated at each visit. Seizure history must be taken into account when planning treatment. Dentists with a comprehension of seizure disorders can provide an invaluable service to their patients, providing not only oral health, but also maintaining and promoting the systemic health of these patients. Patients who have developmental disabilities and epilepsy can be safely treated in a general dental practice. Most patients who have epilepsy can and should receive functionally and esthetically adequate dental care.

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