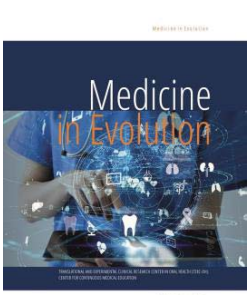
The impact of epileptic disorder in oral pathology



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Abstract

Epilepsy alongside mentally depreciation and other neurological disorders might develop physical, social and mental concerns, particularly, when they start during adolescence. In addition, the seizures scenes along mental deterioration may reduce oral and dental attention bringing about various periodontal and prosthodontics issues.

Epilepsy has direct negative consequences for patient's general dental condition and oral health, the two of which are additionally influenced by lacking oral hygiene; weak oral hygiene itself is regularly likewise brought about by epilepsy-related unforeseen disadvantage. Therefore, missing teeth, caries and periodontal conditions happen progressively regularly in epilepsy patients and they need increasingly dental treatment options and beforehand planning. In any case, in certainty the epileptic patients can get less and more straightforward treatment modalities. The point of this thesis was to survey and integrate examinations on dental treatment in epilepsy patients and to make reference to possible triggers and seizures management in dental practice.

Keywords: Epilepsy, mental deterioration, anti-epileptic medication

INTRODUCTION

Epilepsy is an illness that is often faced by oral and maxillofacial medical practices [1]. It is thought to influence a large number of individuals worldwide and has a commonness of 0.5% - 0.9% in general population [2]. Chapman et al. [3] have proclaimed that epileptic seizures are the second most rudimentary clinical episode during dental medical procedures. Studies have stated the fact that every dental specialist sees in his/her expert life 1.5 occasions summed up as tonic-clonic seizures from the patients [4]. It has been accounted for that the epilepsy happens autonomous of race, age and sexual orientation [1,2]. It has likewise been accounted for those instances of epilepsy that create in adolescence are hereditary in starting point, while those that show up in adulthood are identified with cerebrovascular maladies [2, 5].

In 70% of epilepsy cases, the particular etiology isn't known and there is still beyond a shadow of a doubt. These cases are characterized as idiopathic or essential primary epilepsy. At the point when the etiology of seizures is referred to, the condition is known as optional or obtained epilepsy [5,6]. Auxiliary epilepsies are the after-effect of metabolic, hereditary, basic or practical oddities as electrolyte awkwardness, acidosis, hyperglycemia, hypoglycemia, hypoxia, lack of hydration, water inebriation [7, 8].

Epilepsy is characterized by the World Health Organization (WHO) as an affection of numerous etiologies, described by repeating scenes of paroxysmal cerebrum fists brought about by an unexpected disordered and over the top neuronal release [4].

According to the World Health Organization, epilepsy represents about 1% of the worldwide diseases, as projected by the incapacity to live a balanced life, positioning it soon after some mental issues, for example, alcohol dependence [8]. The dental treatment planning and management of the patients suffering of epilepsy that manifest seizures ought to be done only by dental specialists who have learned about these issues.

The elective treatment generally speaking incorporates the association of the best possible adversary of epileptic prescriptions (AEDs like carbamazepine, phenytoin, phenobarbital, primidone, valproic acid and many others) for the sort of seizure. In any case, different medications prescribed to control the seizure mechanism might have very serious side effects on the oral care and also can massively affect the dental treatment planning and management [9, 10].

Aim and objectives

The aim of the present study was to identify the existent side effects of anti-epileptic medication on dental and oral structures, also observing and analyzing the type of seizures that occurred during dental treatment.

The purpose of this paper is to identify the challenges that healthcare providers encounter during the management of patients suffering of epilepsy that experience frequent seizures. Also, the aim of the research is to focus on identifying the oral hygiene status by evaluating the decayed teeth status and occlusion issues that could be connected to the recurrent epileptic incidents. By evaluating these alterations, specific recommendations can be stated, that could be followed during the dental treatment and further management of the patients.

MATERIAL AND METHODS

The present study is designed as a retrospective observational research that was conducted in the Department of Maxillofacial Rehabilitation of the Oral Medicine and

Hospital Dentistry Clinic (Rambam Medical Center) – Haifa, Israel. A number of 71 diagnosed epileptic patients were included in the study, patients that were admitted into the facility and underwent a dental treatment, during March 2019 – January 2020.

The applied inclusion criteria:

- Patients admitted into the facility who suffered of Epilepsy
- Patients that had a treatment with anti-epileptic drugs
- Patients who underwent a dental treatment under anesthesia

The applied exclusion criteria:

- Patients that were admitted into the facility only for consultation and didn't have a dental treatment into the clinic.

The included information was collected form pre-existing computer archives of the admission into the hospital consisting of case files that enclosed all the medical information needed. The numerical parameters looked up in the study were processed, analyzed and classified using the functions available in 2015 Microsoft Excel. All patients were informed, and a written consent was signed for taking part in the research.

RESULTS

Out of the 71 patients we included in our study, we have found that 11 are under 18 years old, 18 are aged between 18-30 years old, while the majority of patients who underwent a dental treatment in the facility were aged 30 to 50 years old. The lowest age group consisted of 10 patients aged 50 to 70 years old (Figure 1).

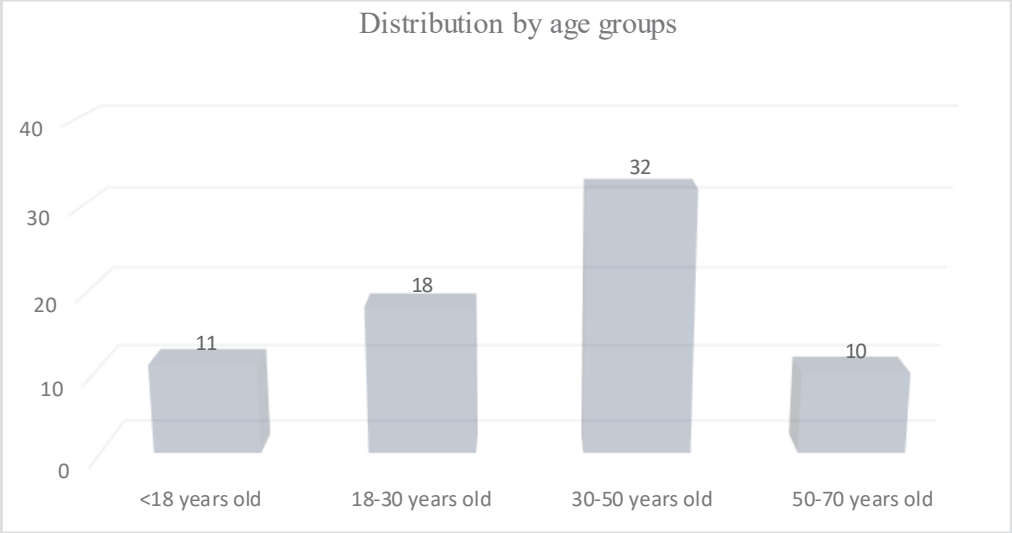

Figure 1. Patients distribution by age groups

As observed in Figure 2, from the total of 71 patients, 39 which represent 54,9% are males, while the rest of 45,1% consisted of 32 epileptic female patients.

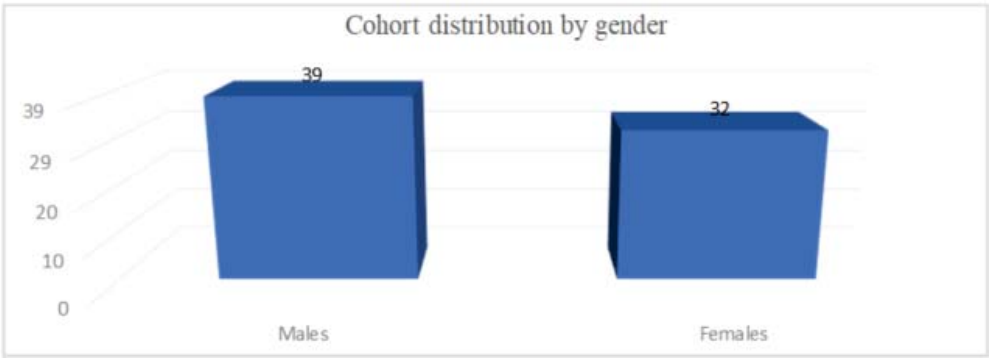

Figure 2. Cohort distribution by gender

Findings showed that a number of 36 patients (50,7%) were addressing the clinic from rural areas and the rest of 35 (49,3%) were located in urban areas (*Figure 3).*

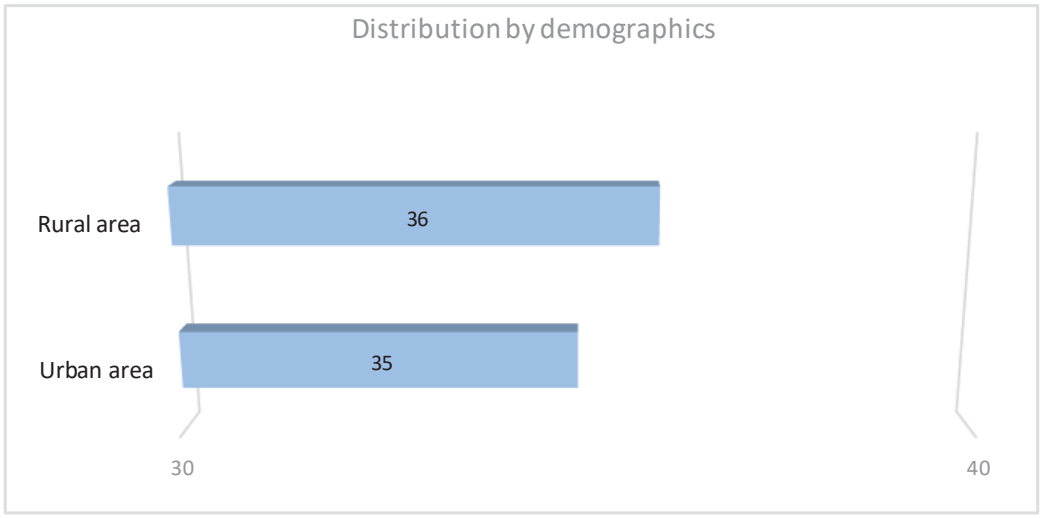

Figure 3. The patients distribution by demographics

Going through the cohort health history and treatment plan, we identified that 57,7% (41) of the patients included in the study had Carbamazepine in their treatment; 47,8% (34pacients) were treated with Phenobarbital, while 33,8% (24 patients) had as anti-epileptic drug Phenytoin. Another 33 patients representing 46,4% out of the total, were keeping seizures under control using Diazepam, while only 8,45% which represented 6 patients were being treated with Ethosuximide. A total of 31 patients (43,6%) are using Valproic acid as a anti-epileptic drug, 16,9% (12 patients) Gabapentin; 19,7% (14 patients) Felbamate; 5,63% (4 patients) Levetiracetam; 12,6% (9 patients) Oxcarbazepine; 7,04% (5 patients) Tiagabine and 9,85% (7 patients) Zonisamide (*Figure 4*).

Antiepileptic drug name	**Number of patients using the AED**
Carbamazepine	41
Phenobarbital	34
Phenytoin	24
Diazepam	33

Ethosuximide	6
Valproic Acid	31
Gabapentin	12
Felbamate	14
Levetiracetam	4
Oxcarbazepine	9
Tiagabine	5
Zonisamide	7

Figure 4. Patients' medication history

Regarding the encountered side effects in the oral cavity or related to the dental structures, 57,7% (41) of the patients included in the study that had Carbamazepine in their treatment suffered of drowsiness, xerostomia, stomatitis, gingival bleeding, rash, osteopenia and osteocalcin. A total of 47,8% (34 patients) that were treated with Phenobarbital were identified with side effects such as osteopenia, steomalacia and drowsiness at times. The 33,8% (24 patients) that had as anti-epileptic drug Phenytoin had associated side effects like gingival hyperplasia, osteopenia, osteomalacia and gingival bleeding. Another 33 patients representing 46,4% out of the cohort that were keeping seizures under control using Diazepam, experienced drowsiness/sedation, same as the 8,45% which represented 6 patients that were being treated with Ethosuximide and the one taking Gabapentin 16,9% (12 patients). The 19,7% (14 patients) that had included Felmabate in their treatment experienced mild cognitive side effects. Patients taking Levetiracetam, Oxcarbazepine, Tiagabine and Zonisamide mentioned unknown side effects of the drugs (*Figure 5*).

Antiepileptic drug name	**Common side effects on oral cavity/ Dental Considerations**
Carbamazepine	Gingival bleeding Xerostomia Osteopenia/Osteomalacia Drowsiness/Sedation Stomatitis Rash
Phenobarbital	Drowsiness/Sedation Osteopenia/Osteomalacia
Phenytoin	Gingival hyperplasia Osteopenia/Osteomalacia Gingival bleeding
Diazepam	Drowsiness/Sedation
Ethosuximide	Drowsiness/Sedation
Valproic Acid	Gingival bleeding Petechiae Decreased platelet count
Gabapentin	Drowsiness/Sedation
Felbamate	Mild cognitive side effects

Levetiracetam Oxcarbazepine Tiagabine Zonisamide	Unknown side effects

Figure 5. Medication side effects of anti-epileptic medication on dental/oral structures

Related to the occurrence of epileptic seizures during the dental treatment procedures, as observed above, out of the 71 patients that we have included in the study, 11 of them representing 7,81%, experienced a seizure during the dental treatment (*Figure 6*).

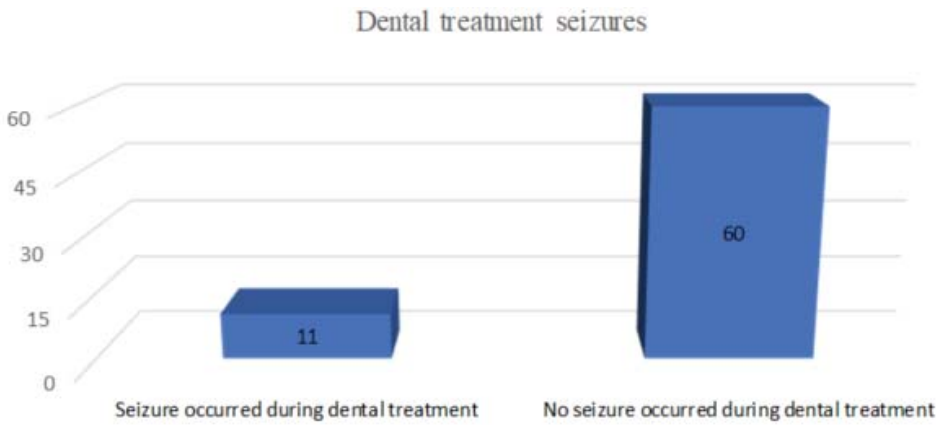

Figure 6. Classification by the presence/absence of the seizure during treatment

Out of the total of 11 patients that had suffered a seizure during the dental procedure, 5 patients representing 46%, went through a generalized tonic-clonic seizure, while 2 patients representing 18% had a first-time seizure and last but not least, 1 patient went through a status epilepticus that required emergency medical attention.

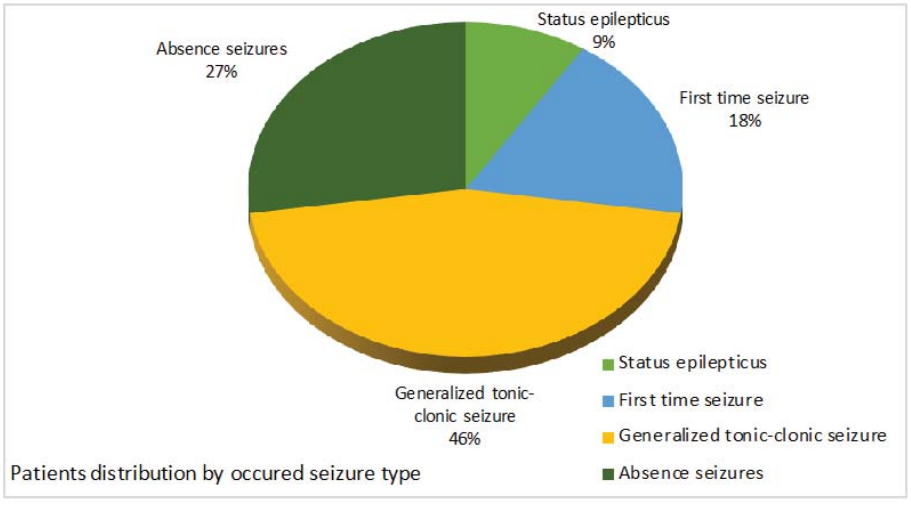

Figure 7. Patient distribution by occurred seizure type during dental treatment

DISCUSSIONS

Epilepsy is an incessant disorder portrayed by the hazard of manifesting repetitive seizures. In Canada, the prevalence is 5.6 per 1,000 people, while in United Stated, the rate looks to be around 43 patients for every 1,000 personas. According to the World Health Organization, epilepsy represents about 1% of the worldwide, as projected by the incapacity to live a balanced life, positioning it soon after some mental issues, for example, alcohol dependence. Understanding epilepsy and seizures brings issues to light of the confusion effect it has on a patient's overall clinical state and mental wellbeing. The dental treatment planning and management of the patients suffering of epilepsy that manifest seizures ought to be done only by dental specialists who have learned about these issues. It is in like manner portrayed subject to the explanation, and it might be characteristic (achieved by a developmental transformation), idiopathic (when an innate condition is careful) or cryptogenic (when the justification is obscure) [8].

The elective treatment generally speaking incorporates the association of the best possible adversary of epileptic prescriptions (AEDs like carbamazepine, phenytoin, phenobarbital, primidone, valproic acid and many others) for the sort of seizure. In any case, different medications prescribed to control, the seizure mechanism might have very serious side effects on the oral care and also can massively affect the dental treatment planning and management [9].

In most undeveloped nations, for example in India epilepsy is mistakenly accepted to be irresistible or potentially brought about by detestable spirits. Subsequently, patients with epilepsy are derided and segregated [10]. This demeanor unfavorably influences the relational connections, instruction, profession/business openings, and the general strength of patients [11]. Self-care is fundamental to one's oral health. be that as it may, because of the unsupportive condition of numerous people with epilepsy, oral care and health is regularly disregarded [12, 13].

Looking at numerous studies worldwide, we have found that about 80% of the people suffering of epilepsy are keeping this disorder under control using anti-epileptic medication. This medication resembling anti-epileptic drugs are also called AEDs and most of them are being used in order to prevent or treat different types of seizures [14, 15]. Anti-epileptic drugs are prescribed by physicians assessing the patients kind of previous seizure, age, possible side effects and drug interaction and also there is considered the cost of the specific medication contrasting financial situation of the patient. There are multiple cases when the seizure episodes cannot be kept under control using only one prescribed medication and, in this situation an alternative AED is added creating a polytherapy against future seizures [16, 17, 18]. Certainly, mono-therapies are most desirable by the physicians because poly-therapy containing various drugs raise the development of multiple side effects. The most well-known unfriendly impacts of the treatment with AEDs are tiredness, drowsiness, unsteadiness, ataxia, and gastrointestinal issues. [19, 20] Anticonvulsants can likewise be the reason of many pathological modifications in the oral cavity. Most of the time, the patient might have the accompanying symptoms like soreness, dry mouth, red, sore or bleeding gums followed by swallowed lips, tongue or face. Other conceivable reactions of anticonvulsant medicine may incorporate bone abnormalities, which can prompt osteoporosis over the long haul of utilization. On the other side, the anti-epileptic drugs can cause augmentation of the gums since there is present gingival hyperplasia [21]. Preceding 1993 the selection of anticonvulsants was restricted to prescribing common drugs like carbamazepine, phenobarbital, phenytoin, primidone or valproic acid [14]. In the course of recent years, a few innovative different prescription drugs have been endorsed and approved after numerous studies by FDA also known as “Food and Drug Administration of United Stated.”

Medical surgery procedure is another treatment alternative for patients who seem to be refractory to the use of AEDs or have seizures or reactions that fundamentally debilitate their personal satisfaction [22]. They should likewise be somewhere in the range of 12 and 50 years of age. Past investigations have demonstrated 75% of patients become seizure free inside the main postoperative year. A few examinations archive the more drawn out the patient has epilepsy preceding medical procedure the more noteworthy there slip by hazard and they are bound to have post-careful airs. There are four generally acknowledged surgeries: corpus colostomy, hemispherectomy, central resection and the last is the different subpair exchange [23, 24, 25].

Factors like toothache and oral contamination, which cause torment, pain and make the patient awkward, may incite epileptic seizures. It is conceivable to treat and dispose of these elements during intermittent dental specialist arrangements, before intricacies emerge [16]. The level of gingival hyperplasia brought about by phenytoin ought to be constrained by forestalling the arrangement of plaque [26]. Be that as it may, plaque expulsion would be incapable except if hyper-plastic tissue is appropriately evacuated during gingivectomy [14]. On the off chance that hyperplasia repeat, the patient should change his prescription after a discussion with his primary care physician [5]. Examination shows that epileptic patients have seriously lacking mouth hygiene, oral wellbeing and poor dental condition, as contrasted and non-epileptic patients.

This is clarified by the way that these patients get inadequate dental consideration since they spend just a brief timeframe in the dental specialist's seat because of the danger of seizure [27]. Besides, their dental condition is compounded by wounds and harm caused to both hard and delicate tissues in the maxillofacial area during seizures. In this manner, defensive strategies, for example, the utilization of chlorohexidine and fluoride and having a routine dental check-up [28].

In the case where a patient suffering of epilepsy needs prosthetic treatment, the dental specialist ought to reflect the manufacture of the prosthetic rebuilding efforts impervious harm or rearrangement throughout an epileptic assault [16]. The removal of prosthesis conceivable dangers yearning of the prosthesis stacking in the respiratory tract. Fixed scaffolds of cast gold or embed reclamations can be unadulterated. They offer minimal possibility of relocation or break. All porcelain materials can present a very high danger of crack or might run a more serious danger by removal [21]. Thus, the patient ought to be educated regarding their remedial choices and the advantages and dangers.

CONCLUSIONS

A careful approach with the patient's health history is the principle essential for effective treatment and can forestall numerous inconveniences. This data should be evoked during their underlying visit when the health history is revised. An important aspect related to the prescription of these patients should make the dental specialist aware of a potential seizure issue. The goal of such inquiries is to determine a total image of the patient's wellbeing. This incorporates assessing the effect of epilepsy in their lives, recognizing any oral issues, and limiting the danger of having an epileptic seizure during a dental visit. The data likewise helps with overseeing and treatment planning and limit any oral or general consequences later on.

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