Oral health status in patients with epilepsy

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ABSTRACT

Introduction: Epilepsy is one of the most common chronic neurologic diseases. It has a great influence on quality of life, as it engages 1-3% of a society. Normally, 10% of the people of the society have experienced seizure once or several times during their lives. Regardingalldentistry aspects, they receive insufficient treatments, which might be due to the medical and economic status of them. Oral health is of paramount importance.

Objective: This research aims at examining oral health status of the patients with epilepsy, comparing them with the non-patient ones from systemic point of view, and evaluating periodontal treatment needs.

Materials and Methods: Sixty patients were randomly includedin this cross-sectional study. They were divided into 2 subgroups of partial and general (based on frequencies of seizures, type of seizure, and mental status). Sixty systemically non-patient people who referred to the Imam Khomeini Hospital for blood donation were randomly included in the study as the control group. They were medical and epilepsy history. Oral examinations were carried out. The Simplified Oral Hygiene Index (OHI-S), decay-missing-filled tooth (DMF-T), normal teeth abrasion rate (Abrasion Index), Prosthetic Index; periodontal treatment needs (CPITN) and Muhleman index were evaluated and a statistical comparison was made between the patient group and the control group and between the epilepsy subgroups.

Results: OHI-S index, DMF-T index, Muhlemman index and Prosthetic index of the patient group was considerably higher than the one of the control group. About CPITN index, In mandible, the patient group has a significant difference with the control group, except in the area of the second left molar.

Conclusion: Several factors contributed to worsening oral health status in the patient group as compared with the control group. For example, the effect of seizure itself, negative attitudes of dentists, and social and economic conditions. We propose to start oral treatments concurrent with the treatments concerning epilepsy. Some special dental interventions were proposed for each subgroup.

Keywords: Epilepsy, Oral healt, Periodontal.

Introduction

Epilepsy is a common chronic neurologic disorder that is characterized by recurrent unprovoked seizures [1]. The overall incidence of epilepsy, is about 1-3% in the general population; and almost 10% of population experienced at last 1-3 seizure during their lives [2].

It's suggested that patients with epilepsy, have worse dental condition compare to the general population [3,4]. The disease may affect the dental status and oral health of patients in several ways. Patients who have seizure disorders tend to have less than ideal oral health, with higher numbers of decayed and missing teeth. They tend to receive less dental treatment, with significantly fewer restored and replaced teeth than the general population [5]. Oral hygiene is one of the most important factors in quality of life, so we have to improve the oral and dental health of these patients.

In this paper, we aim to examine oral health status of the patients with epilepsy, comparing to the non-patient ones from systemic point of view, and evaluating periodontal treatment needs. To our knowledge, few reports had been published with the same subject [5,6], and the other studies only assessed the periodontal status in patients using antiepileptic medication (AEDS) [7,8]. A thorough evaluation of a patient's seizure condition is necessary before initiation of any dental treatment. In order to perform a valid assessment, we divided the patients into 2 subgroups of partial and general (based on frequencies of seizures, type of seizure, and mental status). And we compare different oral hygiene indexes in these 2 subgroups of patients.

Material and Methods

This cross sectional study was performed in the Imam Khomeini hospital complex during 2013-2014. Sixty patients were randomly included in this cross-sectional study. They were divided into 2 subgroups of partial and general (based on frequencies of seizures, type of seizure, and mental status). Sixty systemically non-patient people who referred to the Imam Khomeini Hospital for blood donation were randomly included in the study as the control group. All subjects agreed to participate in the study. In formedconsent was obtained from all participants prior to entry into the study. Using a structured questionnaire, the following information was collected from patients and their parents by the neurologist: demographic, and the influence of seizure in masticatory apparatus (clonic movement of facial or masticatory muscle, oral automatism, grinding of teeth, etc.) based on the questionnaire the patients were divided into 2 subgroups of partial and general seizure. Oral examination was performed using plane mouth mirror and CPTTN probe. The condition of the teethwas estimated by the index of the world health organization.The Simplified Oral Hygiene Index (OHI-S) for the individual is the total of debris index and calculus index. The values for DI-S and CI-S

may range from 0 to 3. The OHI-S values range from 0 to 6: 0-1.2: Good, 1.3-3.0: Fair and 3.1-6.0: Poor. Decay-missing-filled tooth (DMF-T): for evaluating this score all teeth were examined and get a score from 0-7. Normal teeth abrasion rate (Abrasion Index): the degree of abrasion on the teeth was checked and recorded separately from the upper and lower dental arch: 1, no sign of abrasion; 2, superficial abrasion of several teeth; 3, severe abrasion, with enamel damage exposing the dentin [5]. Prosthetic Index; periodontal treatment needs (CPITN) and Muhleman index were evaluated and a statistical comparison was made between the patient group and the control group and between the epilepsy subgroups.

Statistical analysis was performed with SAS 20 and for windows software. OHI-S and DMFT was calculated by one way ANOWA test. The comparison between patients and control group was done by using ANOVA test and in the case of significant results, Tamhane test was carried out. Statistical analysis for the other oral health like CPITN and Muhlemman was done by Kruskal Wallis and Dunn tests.

Result

The age distribution between patients and control group was not different significantly presented in figure1 (p=0.00). 88% of the patient group was in the general seizure group and 12% was in the partial seizure group. OHI-S index in patient group was significantly more than the control group (p=0.00). This significant difference also seen between general and control group (p=0.00) and between general and partial group (p=0.045) DMF-T was significantly higher in the patient group. Number of decayed teeth was similar in the patient group and the control group.

The number of filled teeth was significantly different between control and general subgroup (p=0.043) but there was not a significant difference between partial subgroup and control group, and general and partial subgroups. Table 1.

CPITN indicies in the mandibular teeth of the epileptic group showed significant diffrence (p<0.05), exept in the mandibular left second molar (p>0.05),but there was no significant diffrence among partial subgroup in the mandibular teeth (p<0.05) CPITN index of the mandibular left first molar and left central was different between partial subgroup and the control group (P<0.05), but similar in the mandibular left second molar and right second and first molar. (P>0.05)

table 2. The muhlemann index was significantly higher in the patients than the control group. (p=0.01) This index was higher in the general subgroup compared with the control group. (p=0.05) In the control group most of the patients scored 2 (linear bleeding) but, in the partial subgroup and general group most of the patients scored 3 (triangular bleeding) the number of teeth that scored 4 (profuse bleeding) was higher in the general subgroup than in the control group, and the number of teeth with triangular bleeding was higher in the partial subgroup than the general and control group. Fig 3.

In abrasion index no significant diffrence was seen between patient and control group. (P>0.05) table 3. Errorbar graf and odd ratio (95% confidence interval) of prosthetic index (replaced teeth percent) in the control and partial and general subgroup is seen in figure 4. Percentage of replaced teeth is significantly different between the control and patient group (P = 0.00), but the number of replaced teeth is same between these two groups. (P>0.05) the number of not replaced teeth was significantly more pronounced in the patient group as compared with control group. (p=0.005) The percentage of replaced teeth in the general subgroup was different significantly from the control group (p>0.05), and this significant diffrence was also seen between partial subgroup and control group, and between control group and general subgroup.(p>0.05) table 4. Concenrning AEDs At the time of study. 53.3% of patients

received valproate, 8.33% citalopram, 33.33% carbamazepin (CBZ), 10% lobel, 6.66% clonazepam (CZP), 3.33% phenobarbital,11.6% lamotrigine (LTG), 3.33% topiromate and one of them use no drug. At time of study no patients take phenytoin (PHT) but 5% had been taking PHT previously more than one year ago. Fig 5.
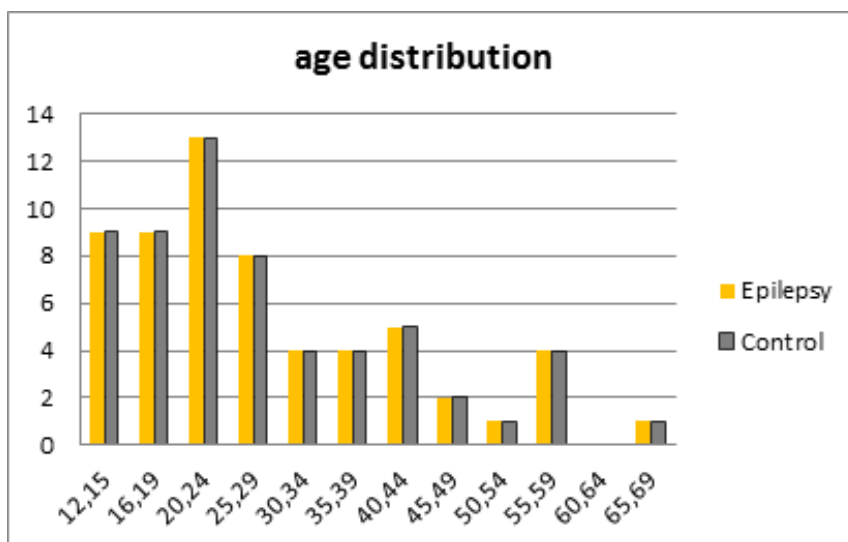

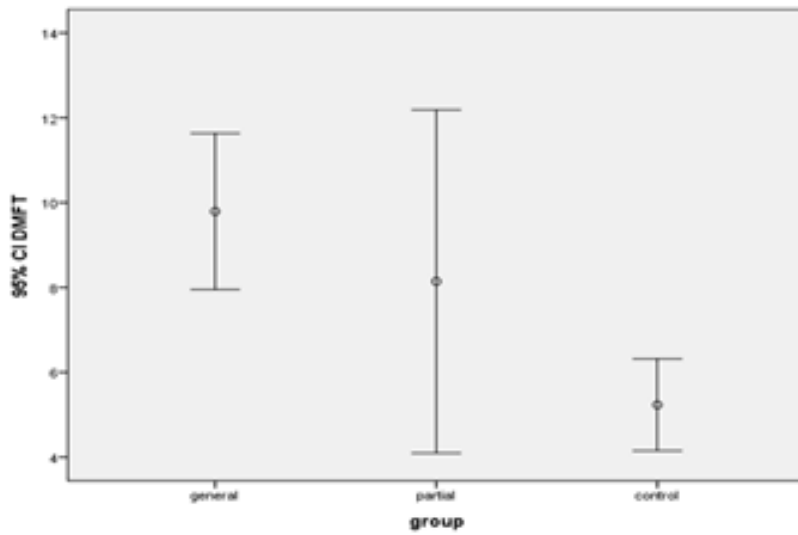*Fig 1.* Age distribution of patient and control group.

Fig 2. Errorbar graf and odd ratio (95% confidence interval) in control group and general and partial subgroup.
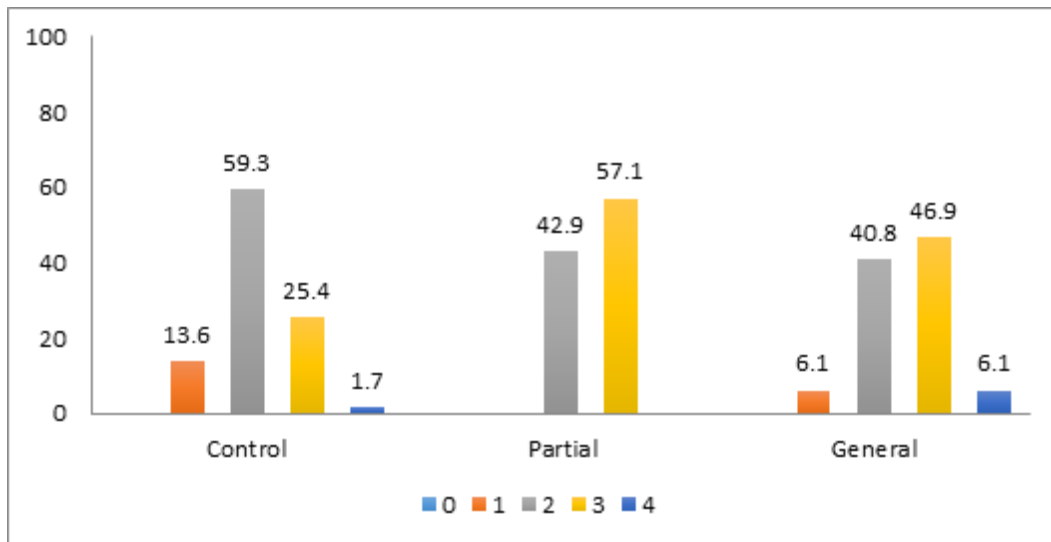

Fig 3. Muhlemman index in patient and control group and general and partial subgroup.
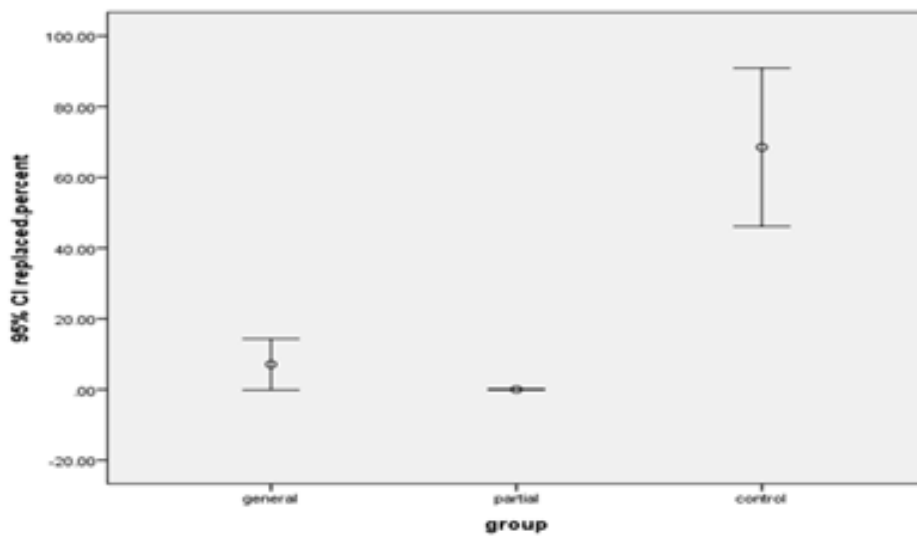

Fig 4. Errorbar graf and odd ratio (95% confidence interval) of prosthetic index (replaced teeth percent) in the control and partial and general subgroup.
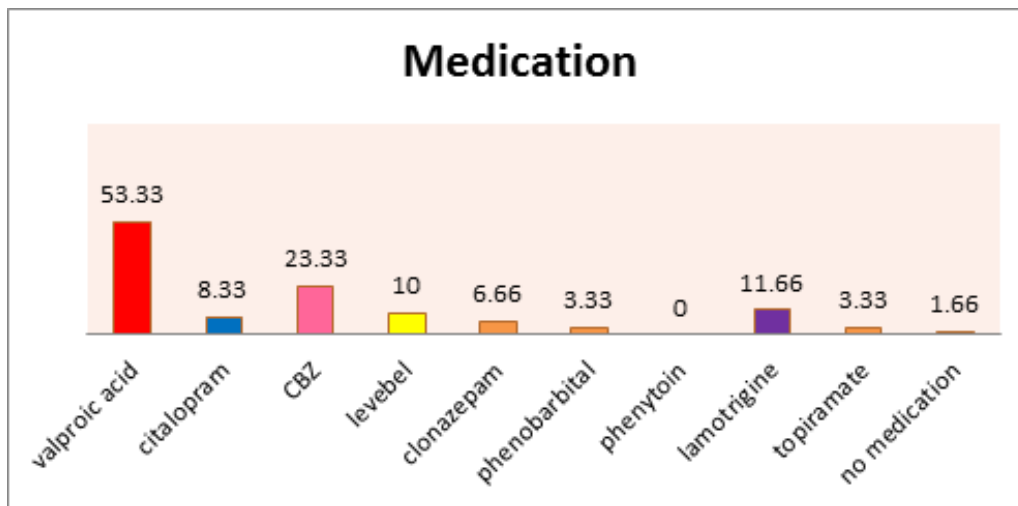
Fig 5. AEDs take by patients at the time of study.

index	group	Group	P value
	General	Partial	.997
		Control	.000
	Partial	Control	.157
D			
	Partial	Control	0.00
	General	Partial	.301
		Control	.043
	Partial	Control	.939
M			
	Partial	Control	0.031
	General	Partial	.950
		Control	.043
	Partial	Control	1.000
F			
	Partial	Control	0.079

Table 1. The comparison of the number of decayed teeth (D) missing teeth (M) and filled teeth (F) in patient and control groups and general and partial subgroups.

Group		P value				
		T 37	T 36	T 31	T 46	T 47
General	Partial	.305	.205	.102	.638	.468
Control	Patient	.051	.027	.002	.039	.020
	General	.058	.043	.013	.011	.005
	Partial	.051	.027	.000	.417	.470

Table 2. Comparison of CPINT index between control and patient group and partial and general subgroup (significant diffrence p<0.05) (37=second left molar, 36=first left molar, 31= left central, 46=first right molar, 47=second right molar).

Group	Abrasion		
	1	*2*	*3*
Partial	*42.9%*	*42.9%*	*14.3%*
General	*75.5%*	*24.5%*	*0.0%*
Control	*88.3%*	*11.7%*	*0.0%*

Table 3. Aabrasion index in patient and control group and general and partial subgroup.

Index	Group		P value
Replaced	*Partial*	*General*	*.436*
	Control	*Patient*	*0.6*
		General	*.776*
		Partial	*.221*
Replaced.percent	*Partial*	*General*	*.154*
	Control	*Patient*	*0.00*
		General	*0.00*
		Partial	*0.00*
Not.replaced	*Partial*	*General*	*.417*
	Control	*Patient*	*0.01*
		General	*.003*
		Patient	*.447*

Table 4. Prosthetic index in patient and control group and partial and general sub group.

Discussion

We havefound that The patients with epilepsy compared with the healthy control in almost every indexes that mesure the oral and teeth hygene, showed a significantly worse condition. The simplified oral hygeine index (OHI-S) was significantly greater in the patients, this probably resulted from insufficient oral health care by patients and their families, and they concerned mostly about their seizure. OHI-S index in general subgroup was also higher than control group and partial subgroup due to the higher number of seizure attack and type of seizure in general group, which cause to the weak neuromuscular control in this group. In Katalin karolyhazy study, OHI-S index was similar in the patient and the control group. However, when only group 3 epilepsy patients was comared with the control group, the difference reached significance. (p=0.033) [5] we have shown that DMF-T index was significantly higher in patient group than the control group. Simillar study hold by Katalin karolyhazy also determined and compared this index in patient and control group. the index and the number of decayed and missing teeth was significantly higher in the patient group than the control group [5]. The number of filled teeth was same in patients and control group, but in general group it was higher significantly than control group. This was probably due to the number of filled teeth, which was not different between partial subgroup and control group. It was similliar In Katalin karolyhazy study, the number of treated (filled) teeth was significantly lower in the epilepsy group than the control group [5]. About the prosthetic index percentage of replaced teeth is significantly different between the control and patient group, but it was same between these two subgroups. The prosthetic index was significantly lower in the patients than in the control group in theKatalin karolyhazy study. The index was the lowest in group 3 [5]. The diffrence between the results of this study and previous study in groups and sub groups is probably due to the different criteria for dividing patients into different subgroups in different study. The number of filled teeth was lower in control group. It is probably the result of inadequate restorative care in the general subgroup and prosthetic care in the patient group, due to the poor socioeconomic status. So they tend to receive less dental treatment, low frequency of dental visit and poor restorative and prosthetic care. furthermore, they did not totally reimbursed by health insurance in Iran.

In the present study we assess and compare CPITN index in every sextant separately in different groups and subgroups. So our findings are more subtle than the previous studies. Like the similar study done by

Katalin karolyhazy the CPITN index showed no significant diffrence between patient and control group. But, we found that this is due to the overlap effect of different sextant. Because when we compare each sextant separately in different groups and subgroups we found no significant diffrence in maxillary teeth between patient and control group. But this index was significantly higher in mandibular teeth in patient's group. In other words, no significant diffrence in CPITN index in maxillary teeth effects our findings in mandibular teeth and reduced its effects.

Demands for gingival treatment in mandibular teeth was significantly greater in patient's group than the control group. But, it was same in maxillary teeth. It seems that this significant diffrence result from poor dental hygiene and low frequency of dental visits. In other words, these patients are at risk of worse gingival condition due to the poor oral hygiene (OHI-S) and inadequate dental and gingival treatment by dentists. Another reason for more decayed and missing teeth, low replaced teeth, high CPITN and muhlemann index in epileptic patients is a negative attitude of dentists about this group of patients. most of them consider that treatment of these patients is more difficult and complicate than the healthy people and they prefer to do simple procedure like tooth extraction than prosthetic and resorative treatments. So, these patients edentate earlier and their quality of life got worst. The more probable reason of these negative attitude is low information and knowledge of dentists about seizure and their fear of seizure during dental procedure. Although there is a risk of seizure during examination, but in our study we have not encountered any seizure during dental examination.

Abrasion index were worse in general subgroup compared with partial subgroup. This might occur as a result of seizure and the contraction of masticatory muscle. This also might cause due to the lowsocioeconomic status and sever episodes of seizure. Thus this patients and their families do not care about their dental status.

Only few epidemiologic studies investigate oral health and hygine in epilepsy patients and most of them only examine gingival overgrowth, the most significant oral complication seen in epileptic patients is gingival hyperplasia from phenytoin, which can occur 1-3 month after starting the treatment. At time of study no patients take phenytoin (PHT) but 5% had been taking PHT previously more than one year ago and gingival hyperplasia was significantly reduced after replacing PHT with other medications. Now PHT is replaced with Valproic acid (VPA) and carbamaze-

pine (CBZ) that have the same effects but fewer side effects. in the study of Dahllof, periodental codition of epileptic subjects was studied. Patients receiving PHT exhibited more units with gingival overgrowth, reflected by the significantly higher number of gingival units with increased probing depth [7]. In our study, 23,33% of patients receive carbamazepine (CBZ) and 53,33% use Valproic acid (VPA), none of them demonstrated gingival enlargement. But in the cross sectional study by Gurbuz, Gingival enlargement was documented in 42% of patients on valproate (VPA) and none on carbamazepine [9]. AEDs can significantly impact the oral tissues. Carbamazepine can cause xerostomia and stomatitis, but in our study these side effects do not seen among 14 patients. lots of study about the side effects of PHT have been published previously but evidence on the side effects of AEDs is lacking.

We have some limitation, first of all some of the examinations seems to be unpleasent specially for the patients with wors condition due to their seizure. The other was the lack of same study in our country. The data was limited overall, there was just one study simillar to ours. In the present study we do not compare teeth and oral hygine knowledge and learning skills between patients and control group. Further studies might consider examining the significant diffrence between this two groups. Several factors contributed to worsening oral health status in the patient group as compared with the control group. We propose to start oral treatments concurrent with the treatments concerning epilepsy. Some special dental interventions were proposed for each subgroup.

Conflict of Interest

There is no conflict of Interest to declare.

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