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Hemiplegia and oral health

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Abstract

Oral health problems are often neglected due to other problems that are thought to be more vital in stroke patients. However, oral health is a significant quality of life determinant and needs to be protected in stroke patients as well as general population. Moreover, problems such as hemiparesis, hemiplegia, dysphagia, balance and coordination disorder and cognitive dysfunction due to strokes have a very negative impact on the self -care and/or care support of the caregivers. In this study, we aimed to search a large number of health databases and make a compilation on oral health problems, impact on quality of life and solutions in stroke patients. Keywords 'oral, dental, health, care, hygiene, dental, prosthesis, denture, tooth brushing, stroke, cerebrovascular and cardiovascular' and combinations of these words were searched in the literature. Studies involving at least one subject for oral health in stroke patients were included in the review. In the literature, it was seen that the oral health of the stroke patients was discussed more about mastication, swallowing, dysphagia, nutrition, hygiene, prosthesis and quality of life. It was concluded that there are no sufficient assessment and care guides that can be used by stroke patients or caregivers, and the information of dentists, patients and caregivers about special care for stroke patients was not sufficient.

Keywords: : dental health, oral hygiene, stroke, teeth

1. Introduction

Stroke is a disease characterized by the formation of focal neurological deficits as a result of brain lesions developed by embolism, ischemia or hemorrhage (1).Considering that approximately 15 million people have strokes each year and about one third of them die and one third of them are permanently disabled, it will be realized that the community affected by the stroke is too crowded (2).Stroke is the most common cause of neurological disability worldwide (3,4).It is the third cause of death after coronary artery disease and cancer (5).World Health Organization describes oral health as a person's being free of problems of biting, chewing, smile, speech and psychosocial, oral and facial pain, oral and throat cancer, oral infection and wounds, periodontal disease, dental decay, dental loss and other diseases (6).Factors such as hemiparesis, hemiplegia, spasticity, dysphagia, coordination disorder and cognitive dysfunction that occur with the influence of the central nervous system adversely affect the general life of the patients and seriously affect their oral health (2,7-9).In particular, techniques for oral hygiene, use of auxiliary devices and training of patients and caregivers are gaining importance. In addition, interventions for mastication, swallowing, nutritional problems and dental problems are required. Oral health problems are often neglected due to other problems that are thought to be more vital in stroke patients. However, oral health is a significant quality of life determinant and needs to be protected in stroke patients as well as general population. In this regard, health professionals, patients and caregivers need to be informed.

Due to the limited publications containing all the details related to oral health in patients with strokes in the literature and the lack of existing information that has been brought together, this study aims to present the details of oral health in patients with strokes in the light of the current literature, ie the effect of oral health problems in stroke patients, the quality of life and solution suggestions to problems. We also aimed to contribute to the education of all stakeholders of this disease.

1.1. Material and Methods

Keywords 'oral, dental, health, care, hygiene, dental, prosthesis, denture, tooth brushing, stroke, cerebrovascular and cardiovascular' and combinations of these words were searched in a large number of health databases (PubMed, Cochrane, Embase, MEDLINE and others). Studies involving at least one subject for oral health in stroke patients were included in the review. Current approaches and standards were investigated.

The fact that the populations examined in the studies contain any of the ischemic or hemorrhagic stroke were deemed sufficient to be involved in our study. The references of the articles included in order to determine the articles that may have been overlooked were searched, too.

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2. Results and Discussion

2.1. Oral health problems in stroke patients

Some studies have shown that oral health problems especially tooth loss, dental caries, and periodontal diseases are more frequent in stroke patients than the healthy individuals (10-15).

Factors such as hemiparesis, hemiplegia, spasticity, ataxia, apraxia, dysphagia, coordination disorder and cognitive dysfunction that occur with the influence of the central nervous system adversely affect the general lives of the patients and seriously affect their oral health (2,7-9,16).

Hemiplegic patients are insufficient to use their affected hands to brush teeth (2). It is often not possible to brush an effective brushing with non -dominant hand. As a result, dental caries and periodontal diseases can be seen (2). Stroke patients, who cannot perform their self -care because of their physical and/or cognitive status, are dependent on their nurses or caregivers (17). Some previous studies have shown that more than two -thirds of the patients had difficulty in brushing teeth in a way in relation to the severity of stroke. Although there is a gradual decrease in the post -stroke healing process, it is still stated that approximately half of the patients could not perform the ideal teeth brushing action (18,19). As a result of hygiene decreasing in the oral cavity, plaque formations, tooth decay, infection and halitosis may develop (20-22). Studies have shown increased bacterial colonization and fungal formation in stroke patients compared to non –stroke patients (23). In stroke patients who perform worse in daily life activities it has also been reported that the development of *Staphloccoci spp.* and *Candida spp.*is higher. This result shows the importance of self -care and nutrition in stroke patients in preventing bacterial colonization and thus protecting oral health (24).

It has been shown that colonization has increased due to dental prosthesis and as the device usage prolongs in intubated patients. There are also studies showing that gingival bleeding is higher in stroke patients (25). Another problem in stroke patients is dry mouth-xerostomia. It is usually seen as a side effect of drugs used and has been shown to develop more in stroke patients than non -stroke patients. Bacterial and fungal colonization and plaque formation may increase as a result of xerostomia (21,26-29). *Candida albicans* development is more common in hospitalized stroke patients, especially under antibiotic treatment (30).

In the studies, it was emphasized that the impact of the possible healing process after the stroke and the efforts of the caregivers decrease the yeast colonization and plaque formation. The contribution of rehabilitation to healing cannot be denied (18,25).

Patients with strokes may experience chewing, eating, drinking, swallowing and oral hygiene problems because of the affected lip, tongue, chewing muscles, soft palate and pharynx (20,26,31-34). Chewing and swallowing activities may be seriously impaired especially in moderate and advanced stroke patients. The biting force may be reduced on the affected side. In addition, it is possible to develop atrophy in chewing muscles in patients who cannot be fed for a long time. In both cases it disrupts nutrition. Previous studies have shown that up to 70% of stroke patients could not be fed sufficiently due to chewing and swallowing problems. The condition of the chewing muscles and temporomandibular joint in patients with stubbornness may cause malocclusion, impaired appearance and orofacial disorder (35).

Especially dysphagia is a serious risk factor for aspiration pneumonia, an important cause of death in stroke patients. In the presence of non -appropriate hygiene conditions in the mouth, advanced bacterial colonization occurs, especially aerobic gram-negative bacteria *Escherichia spp*., *Enterobacter spp*., *Klebsiella spps*, *Morganella spp*. and *Proteus spp*. (2,20).

In case of facial paralysis, the patient's buccal sulcus may not be aware of the accumulation of food residues. The tongue will naturally have the ability to clean the oral cavity and will not be able to reveal this feature in case of paralysis. For this reason, it is important to clean the oral cavity and sulcus with a toothbrush or with the help of a gauze wrapped in a finger. If the patient uses dental prosthesis, the cleaning of the prosthesis is also very important (21,27).

It should be remembered that problems such as aphasia will adversely affect the communication between the patient and the dentist and caregivers (10).

Stroke is more common in men (36). In accordance with this information, there are studies showing that the frequency of dental decay is more frequent in male stroke patients (37,38).

In the normal population of sixty and over, there are studies showing that some tasks related to personal care are approximately 10% and the rate of need for assistance in the field of daily living activities is approximately 40%, and as the age progresses, there are studies showing that dependence on others increases in daily living activities (39-41). In patients over sixty years old, there are studies that indicate that there is more gingival disease than younger patients. In addition, it has been reported that gingival health is worse in the elderly with acute strokes compared to the healthy elderly in the same age group. The frequency of applying to the dentist urgently due to the gingival problem among individuals with stroke history has been reported as high compared to the normal population (42-44).

Various studies for the perception of oral health status in the elderly have demonstrated different results. In some elderly populations, dissatisfaction with oral health came to the forefront, while in some studies, it was concluded that oral health is not cared for (45-47). This can be attributed to the socio-cultural state of the populations studied or the perception that other diseases are more vital. Since stroke is mostly seen in older individuals, the perception of oral health of stroke individuals may vary as in the general elderly population.

Due to the high frequency of stroke in the old age group, the possibility of using dental prosthesis increases, which has been reported in a study that approximately half of the patients with strokes were reported to use dental prosthesis (18,42). In another study, it was reported that the rate of patients who can use prosthesis instead of the lost teeth was lower than expected, and that the reason for this may be the inability to reach the health institution due to the bad socioeconomic condition that prevented intervention and the bad functional condition (37). It is obvious that stroke patients cannot perform the care of dental prostheses due to motor losses. In patients with hyperactive gag reflex, the problem of inability to tolerate dental prosthesis may also occur. For this purpose, even palatal anesthesia may be required to solve this problem of glossopharyngeal nerve (48). In some patients, revision of dental prosthesis may be required after stroke to adapt to the mouth better (27,49). The frequency of patients who needed this was as 42% in a study (50). It should be kept in mind that problems such as bad appearance, wound, infection, aspiration and nutritional failure due to inappropriate dental prostheses may develop (21,51).

It should be remembered that diabetes, which is a risk factor for stroke, are also a risk factor for the oral health problems of xerostomia, dental caries, fungal infections, dysphagia and glossodynia (52). In addition, another risk factor for stroke was reported to be associated with more teeth loss in stroke patients (37).

In a study with four hundred and ten strokes, low socioeconomic condition, unemployment and low education level were associated with impaired oral health. In addition, low functional independence and permanent function disorders were also associated with poor oral health (37).

The number of publications investigating the frequency and order of dentist control after stroke is limited. Among these studies, there are studies indicating that the proportion of stroke patients going to the dentist control was approximately three - quarters, the reason for this is that there are problems due to stroke such as dependence to the house, dependence to a wheelchair, inability to drive and inability to climb stairs (19).

2.2. Oral health related quality of life in stroke patients

These problems adversely affect the quality of life of the affected individual. Hemiparesis, which is frequently encountered in stroke patients, reportedly causes permanent insufficiency affecting the quality of life in approximately 70% of patients (53,54). Physical function and psychosocial deterioration of the affected individual should adversely affect the quality of life and cause an increase in the disability (55-57). Oral health is effective on the quality of life in physical and psychosocial context (58,59). Oral health was also found to be associated with the quality of life in patients with strokes (60,61). Decomposition in general appearance, eating, drinking and speaking abilities due to oral health will adversely affect the psychology, social participation and quality of life of individuals with strokes. A study has shown that almost all of the patients with strokes are not satisfied with the general appearance of their teeth. In the studies that evaluate the quality of life associated with oral health, the quality of life is bad in both acute and progressive rehabilitation stages in patients, and the quality of life associated with oral health is much worse in patients with strokes than non-stroke patients. In addition, it has been reported that the quality of life in edentulous patients is worse than the dentulous patients (19).

2.3. Assessment and management of oral health in stroke patients

Among the scales used frequently to evaluate oral health in patients with stroke, Oral Health Impact Profile 14 (OHIP-14) Oral Assessment Guide, Oral Health-Related Quality of Life (OHRQol), Geriatric Oral Health Assessment Index (GOHAI) and Medical Outcomes Study 12-item Short Form (SF-12) are included (62). There is no data showing the superiority of these scales. These scales are the scales that can be completed by the individual or by their caregivers. When it is evaluated whether there is a difference in the completion of the scale by the person himself or the caregiver, it is concluded that there is no difference in general except for subjective parameters such as pain and sensitivity and that the scale can be completed by the patient himself or the caregiver.

In the literature, methods to reduce bacterial colonization, plaque formation, gingival bleeding and halitosis are mentioned and there are no detailed results. These methods include manual or mechanical tooth brushing, sponge brushes, mouthwashes, brushes for dental prosthesis and ultrasonic irrigation (2).

The full and accurate training of health professionals, patients and caregivers about oral health of patients with strokes seems to be a must (2,63). It is known that separate special clinics are formed for dental and oral health of individuals with obstacles (2,64,65). For these patient groups that require special interest and care, it seems important to encourage and experience dentists (2,66). Information of the patient and the caregiver and training should be performed by the dentist. Dentist should be cautious in terms of bleeding, considering that patients with strokes are prone to gingival bleeding and using anticoagulants for prophylaxis (67). The appropriate time for elective interventions after stroke is controversial. In addition to the opinion that elective interventions should be avoided up to 3-6 months after the stroke, there are also opinions that argue that if the patient is stable, it can be intervened within a few weeks after stroke (21,50,68,69)

Oral care is usually performed by nurses in patients with stroke in acute periods and is generally known to be reluctant in this regard. For this reason, it is also left to personnel who do not have authority and knowledge. In intubated patients, oral care may be disrupted due to the fear of damaging intubation. The education of nurses who will do oral care is given by seniority from their own professional group not by

professional dentists, and continues to be applied by traditional methods and patient care cannot be performed according to current guidelines (2,70,71). The absence of equipment such as toothbrushes, toothpaste, rinses, artificial saliva and floss in the units where patient follow -up is performed is also a distinct problem.

In a randomized controlled study, the quality of life associated with oral health was found better in the group receiving an electric toothbrush, mouthwash and oral hygiene training than the group receiving manual tooth brushing and oral hygiene (62).

Oral health risk assessment should be performed in patients with strokes. Oral care of patients should be performed at least twice a day (72,73). Regular oral health assessments should not be neglected.

In patients with strokes, the protection of oral health and the solution of problems that may develop are as important as in the general population. However, considering the special needs of stroke patients, all the health professionals, patients and caregivers should be educated, encouraged and experienced. For interventions to stroke patients, it is necessary to develop some standardized guidelines, and in order to develop these guides, there is need for studies on the oral health of patients with stroke.

Conflict of interest

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Authors' contributions

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