Analysis of Fixed Prosthetic Appliances in Patients living in the Metković Region, Croatia

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Summary

Epidemiological studies on the condition of existing or the need for new fixed prosthodontic appliances, with the purpose of planning required prosthetic teams, improved materials and methods, are essential in modern prosthodontics.

The aim of this study was to evaluate the aesthetic material used in patients with fixed prosthodontic appliances in the Metković region and determine the frequency of crowns and bridges in relation to age, gender, level of education, employment, socio-economic status and frequency of regular visits to the dentist. examination The study included 212 patients, wearing fixed prosthodontic appliances, who were examined in the dental office (clinic) at the Metković Medical Centre during 2001. Descriptive statistics and (2 tests were used during data analysis.

The following conclusions were made: 1. The older group of patients had significantly more bridges than crowns ($p<0.01$). There was no significant difference between gender with regard to the distribution of crowns and bridges ($p>0.05$), or between patients of different levels of education ($p>0.05$). Retired patients had significantly more bridges than crowns compared to employed or unemployed patients ($p<0.,05$). Patients who visit their dentist regularly (once a year or more often) had significantly more crowns than bridges compared to the patients who visit their dentist irregularly or when in pain ($p<0.01$). This group (irregular visits to their dentist) had more teeth extracted and consequently bridges than the patients who regularly visit their dentist . There was no significant difference between patients with regard to crown and bridge prevalence, depending on the age when they first visited the dentist ($p>0.,05$). Less educated patients had more fixed prosthodontic appliances older than 10 years than better educated patients ($p<0.01$). 2. Relatively high frequency of porcelain (64%) was recorded in comparison to acrylic material (36%). There was no difference in gender depending on the material used ($p>0.05$). Patients older than 60 and less educated patients had more acrylic appliances than younger patients (<39 years) who had mainly only ceramic appliances ($p<0.01$).

Key words: *fixed partial denture (fixed prosthetic appliances), Metković region, age, gender, material.*

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Introduction

The status of the stomatognathic system and prevalence of prosthetic appliances in a certain population depend on many different factors such as: economic status, education, genetics, preventive care, nutritional habits, oral hygiene, age , frequency of visits to the dentist, dentist's preference for a certain type of prosthetic appliance, financial support for a certain type prosthetic appliance provided by social insurance, location of the dental clinic (office) in relation to the patient's residence(1-19). Better preventive care in some countries has improved oral health and reduced the need for therapy with removable substitutes (restorations), as for example in Sweden (20, 21), which is the goal other highly developed countries (22). The type and frequency of fixed prosthetic appliances and the material used for their production (fabrication), vary between different age groups of patients in the countries where investigations have been conducted. (23-25). Such differences also exist between elderly healthy people who live alone (26,27), elderly people who live in homes for the retired (28) and among the urban or rural population (8,9). In spite of the great effort that has been invested in dental protection, education and prevention throughout the world, the World Health Organisation concludes that caries, periodontal diseases and malocclusions are continuing to rise and represent a problem for the dental profession (29).

Powell (30) stresses environmental factor as crucial in the occurrence (emergence) of caries and consequent loss of teeth, and he distinguishes demographic, ethnic, cultural and socio-economic factors. This point of view was corroborated by other authors (31-33). Ainamo (34) and Bouma (35) claim that caries is the main reason for the loss of teeth in highly industrialised countries in all age groups. The loss of teeth, particularly in the distal area, in our population, is also the result of carious lesions, which already appear in schoolchildren (36).The loss of teeth, particularly in the distal area, is reflected in the entire stomatognathic system and its functional dynamics. The condition of oral health is specific for every population, which undoubtedly points to the need for epidemiological investigations in dentistry within the framework of numerous multidisciplinary anthropological investigations conducted on the populations of particular regions.

Aim of study

The aim of the study was: 1. to determine the oral status of patients of the Metković region with fixed prosthetic appliances (FPA) older than one year.2. to investigate the influence of some factors, such as age, gender, education, first visit to the dentist and frequency of visits to the dentist, frequency of crowns and bridges and choice of aesthetic material on prosthetic restoration in these patients.

Patients and methods

During the period from February to October 2001, 212 patients were examined in the dental clinic (office) at the Metković Medical Centre. . Only those patients who had a fixed prosthetic appliance and who had correctly filled in the questionnaire, which was created for this purpose, were included in the study. The further analysis included 150 patients, out of which 81 were male and 69 female, aged from 18 to 80 years, of all levels of education and socio-economic status. Subjects were classified into 3 groups according to the level of education (low, middle, high), according to age into four groups (up to 19 years, 20-39 years, 40-59 years, and 60<), according to habit of teeth brushing into 7 groups (once, twice or 3 times a day, once in a few days, once or twice a week, once in two days, it varies or does not know). According to the number of visits to the dentist, subjects were classified into 4 groups (once a year, several times a year, once in a few years or when in pain). According to work activity, subjects were classified into 3 groups (employed, unemployed, retired). According to data on the use of dental floss, subjects were classified into 3 groups (yes, no, sometimes), while data on additional oral-hygienic habits were classified into 6 groups use of electric toothbrush, rinsing solution, or does not use any of this.

Habits such as smoking, alcohol, coffee etc. were classified into 14 groups, and nutritional (dietary) habits were classified into 13 groups. According to diseases, the subjects were classified into 3 groups (acute, chronic, contagious). Dental examination was performed which included case history, hygienic level of the oral cavity, types of fixed prosthodontic appliance, the material used for the appliance, the relation between the fixed prosthodontic appliance and marginal edge of the gingiva (at the level of the gingiva, above the level, or below the level. The age of appliances was divided into 5 groups (0-5, 5-10, 10-15, 15-20 and 20 years). Difficulties experiences by the patient were recorded.

Analysis of the obtained data was carried out by using the statistical program SPSS 10.0, Windows Operative System. Descriptive statistics were done, the distribution of the data was shown in percentages and comparisons made by x2 test.

Results

The examination was conducted on 212 patients, treated in the Metković Medical Centre during the year 2001. 150 subjects who had fulfilled all required conditions were included in the statistical data analysis.

The frequency of crowns and bridges increases in relation to the patient's age, which was expected, as the number of extracted teeth increases with the age of the patient ..,Subjects in the first two age groups had identical results, i.e. more crowns compared to bridges, while subjects in the groups older than 60 years had statistically significantly more bridges than crowns (χ^2 = 9.387; $p<0.025$), (Graph 1). There was no significant difference in the distribution of crowns and bridges between women and men ($\chi^2=3.31$, $p=0.05$), (Graph 2). Patients who visit their dentist regularly have significantly more crowns than bridges, while patients who visit their dentist once in a few years or when they are in pain have significantly more bridges than crowns ($\chi^2=12.79$, $p<0.02$), (Graph 3). There was no significant difference in the distribution of crowns and bridges between different levels of education ($\chi^2=1.68$, $p>0.05$), (Graph 4). There was no significant difference in the distribution of crowns and bridges between patients who visited their dentist for the first time at different ages ($\chi^2=3.541$, $p>0.03$), (Graph 5). Distribution of crowns and bridges in relation to work activity of the subjects showed that retired patients had significantly more bridges than crowns, which was expected with regard to this age group (60 years and over) ($\chi^2=6.755$), (Graph 6). Patients with high and medium level of education had significantly more fixed prosthetic appliances which were less than 10 years old, while patients with a low level of education had significantly more fixed prosthetic appliances older than 10 years ($\chi^2=15.725$, $p<0.01$), (Graph 7). In the group younger than 59 years there were significantly more appliances made of ceramic material, while in the group older than 60 years there were appliances made of polymer materials ($\chi^2=30.075$,p<0.,01), (Graph 8). There was no significant difference between the materials used and the gender of the subjects ($\chi^2=3.30$, $p>0.05$), (Graph 9.).

Discussion

Epidemiology is a branch of medicine which studies the role and significance of different factors in the occurrence, development, incidence / trend, prevention and control of diseases and conditions which deviate from the physiologically normal health of people (37). In dentistry, epidemiological investigations provide data on the prevalence of caries, number and type of extractions, level of oral hygiene, nutritional habits, socio-economic status, influence of inheritance on diseased hard and soft tissues in the oral cavity etc. (descriptive oral epidemiology). The data obtained can help to explain the causes and incidence of oral diseases (caries, periodontopathy etc.) with the purpose of improving dental health protection and oral health.

According to the World Health Organisation, today caries is still the major problem in oral pathology, and is directly connected with the loss of teeth (29). Numerous studies have shown the

multifactorial aetiology, and the opinions of different authors disagree: Ismail claims that caries occurs due to the interaction of social, cultural and biological factors (38). People with a lower socio-economic status have financial, material and social problems which jeopardise their ability to care for themselves, use professional health services and ensure healthy living conditions (39,40). Later studies in Europe systematically show the strong influence of social status on oral health (41). A high KEP index was also established in this ountry (42,43). There is undoubtedly a tendency towards a decrease in KEP index in countries with a higher standard, because of the extensive preventive programs, better prenatal care, better programmes for pre-school and schoolchildren (44). Winter (45) considers that reduced teeth brushing does not increase the prevalence of incisor caries, while other authors do not find correlation between the frequency of teeth brushing and caries (46). Tubert et al. (47) did not find statistically significant correlation between teeth brushing and KEP index. On the contrary Sheimham's results showed correlation between dental caries and inadequate and reduced brushing (48).

Apart from numerous other factors, nutrition has an affect on the occurrence of dental caries, both endogenously and exo genously, or combined, depending on the tooth development (49).

The consideration of epidemiological data, with a view to finding the influence of inheritance on the occurrence of diseased soft and hard tissues, are extensive. Biggerstaff claims that teeth develop within limits given by genetic information specific for the species, with processes of gradual evolution. Development of the teeth is controlled by continuous mechanisms of feedback , as well as systems of change, which results in the typical ultimate appearance. The genetic information, registered in the genotype, adapts in interaction with numerous environmental factors (50). Other authors are in agreement (51). Numerous mechanisms of the interactions between genetic and environmental factors are still unexplained and clearly there is a need for further investigations of the problems concerned. With this aim in mind, investigations have been conducted in isolated areas and the results show marked genetic basis for various cavity problems (52,53). On the other hand Corrucini et al deny genetics and give priority to the influence of the environment , i.e. different, softer food, together with poorer functional loading (54).

Conclusions

1. The older group of patients had significantly more bridges than crowns ($p<0.01$). There was no significant difference between gender with regard to the distribution of crowns and bridges ($p>0.05$), as also between the patients of different levels of education ($p>0.05$). Retired patients had significantly more bridges than crowns in comparison to the employed patients ($p<0.05$). Patients who visit their dentist regularly (once a year or more often) have significantly more crowns than bridges than patients who visit their dentist irregularly or when in pain ($p<0.02$), which leads to the conclusion that the subjects who visit their dentist irregularly have a higher percentage of extracted teeth and therefore bridges. There was no significant difference between patients in crown and bridge prevalence depending on their age when they f the first visited the dentist ($p>0.05$).

Less educated patients had more fixed prosthodontic appliances older than 10 years than the more educated patients ($p<0.01$).

2. Almost all fixed prosthetic appliances older than 10 years were made of ceramic material (98%), while polymer materials were more frequent in fixed prosthetic appliances older than 10 or 15 years ($p<0.01$). Relatively high frequency of ceramic appliances (64%) was recorded in comparison to polymer materials (36%). There was no gender difference depending on the material used ($p>0.05$). Patients older than 60 years had more appliances of polymer material compared to the younger patients, while patients younger than 39 years had almost exclusively ceramic veneers ($p<0.01$). Less educated patients had more appliances of polymer materials.