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Denture Repairs in Different Regions of Croatia in Relation to Prosthodontic Teams

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A B S T R A C T

The purpose of this paper is to evaluate the incidence of denture repairs in different districts of Croatia through the year of 2002. and to analyse the percentage of different repairs (relinings, simple repairs up to 2 elements and complicated repairs-more than 2 elements) in relation to prosthodontic teams. Data on the number of dentures, and the number and types of denture repairs delivered in the Croatian regions of Zagreb, Rijeka, Split and Karlovac were obtained from the Croatian Insitute for Health Insurance for the whole of the year 2002. Information of the number of prosthodontic teams operating in those regions was also obtained. Proportionally more denture repairs were carried out in Karlovac (18%) than Split (5%). The smallest percantage of dentures that required relining was registered in Split and the highest in Rijeka ($\chi^2=36.7$, $p<0.01$). The smallest percentage of simple repairs was registered in Rijeka and the highest in Split ($\chi^2=24.3$, $p<0.01$).The smallest percentage of complicated repairs was registered in Split and the highest in Karlovac. In each region the proportion of denture repairs and types of repairs were correlated with a number of prosthodontic teams in that region. Karlovac had the smallest percentage of specialistic prosthodontic teams and the highest rate of denture repairs.

Key words: *removable denture repairs, prosthodontic teams, Croatia*

Introduction

Clinical follow-up or longitudinal studies of patients with removable dentures (RDs) are not commonly reported. It is likely that such reports are important in the study of factors considered to be significant for the longevity of removable dentures. Factors that are likely to be related to the survival rate (and failure) of removable dentures include technical, biological and »combined biological and technical« factors. A Swiss study by Studer et al.[1] assessed the survival rate and the reasons for failures of 130 combined fixed-removable dental prosthesis in 112 patients in Zurich and some 50 of these prostheses (38.5%) were categorised as failures. Of these 50 failures it was reported that 3 failed due to technical reasons, 36 due to biological reasons and 11 failed due to both, biological and technical reasons[1]. A study by Ettinger et al.[2] on 1,000 elderly people found that 53 of 1,000 persons needed a repair, reline, or replacement of an existing denture. A Finnish study by Peltola et al.[3] reported that 25% dentures needed a repair or replacement among 415 elderly RD wearers in Helsinki. Furthermore, a New Zealand study of dependent elderly people living in rest homes and geriatric hospitals in the Manawatu and Horowhenua regions reported that 18% of upper dentures and 26% of lower dentures needed replacement, while a further 24% of full lower dentures required relining[4].

It has been reported that acrylic resin partial dentures fracture on average about four times more frequently than metal-based partial dentures[5]. A fracture of metal frame appears in 10% to 20% of the removable partial dentures after 5 years and in 27% to 44% after 10

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years[6]. Quality of RDs is sometimes correlated with a lack of denture repairs[7–11].

According to this literature review, it is clear that many people currently use dentures, but that failure of dentures due to biological and technical reasons is a problem within the profession. In well-developed countries the proportion of the population that is partially or fully edentulous is declining[12,13]. In light of this finding some researchers have even raised the question as to whether denture training should be removed from the dental curriculum[14].

Little published information exists on denture deliveries and even less exists on how deliveries of new dentures relate the delivery of denture repairs.

Construction of partial or complete removable dentures is mostly covered by Croatian Health Insurance service once in a 5-year period. Both, specialists of prosthodontics and general dentists are allowed to construct removable dentures in Croatia.

Thus, the objectives of this study were to report on dentures (delivered under health insurance) in different regions of Croatia during the year of 2002. and to explore how the delivery of new dentures relates to the delivery of denture repairs in different districts of Croatia.

Materials and Methods

The Croatian Institute for Health Insurance provided the data about number of dentures delivered in the Croatian regions of Zagreb, Rijeka, Split and Karlovac during the whole of the year 2002., as well as about number and a type of repairs.

Information about number of prosthodontic teams in the same regions in relation to a population living there was obtained from the Croatian Prosthodontic Association.

Types of denture repairs included: relinings, simple repairs of up to 2 denture elements, and complex repairs of 3 or more denture elements. Denture repairs were expressed as percentage of denture deliveries during 2002. in each district. Information on each type of denture repair was also calculated for each district, and these data were related to the number of prosthodontic teams in each region.

Bivariate analyses using the χ^2 test were used to explore differences between region and percentages of each type repairs. The level of statistical significance was set at 0.05.

Results and Discussion

The percentage of denture repairs in different districts is shown in Figures 1a–d. The highest percentage of repairs, (18%) were registered in Karlovac (less than 100,000 inhabitants), followed by 13% in Rijeka (more than 250,000 inhabitants), 7% in Zagreb (more than 1000,000 inhabitants) and finally by Split (more than 350,000 inhabitants), where only 5% of denture repairs were registered (Figures 1a–d).

A statistically significant difference in the percentage of dentures receiving relines was observed between Split and Rijeka (χ^2=36.7; p<0.01), with the lowest percentage in Split and the highest percentage in Rijeka (Figures 2a–d).

The smallest percentage of simple repairs was registered in Rijeka and the highest in Split (χ^2=24.3; p<0.01) and the difference was statistically significant.

The smallest percentage of complicated repairs was registered in Split and the highest in Karlovac (Figures 2a–d).

Simple denture repairs such as fractures could happen during the procedure of maintaining denture hygiene if a denture is dropped down or during chewing

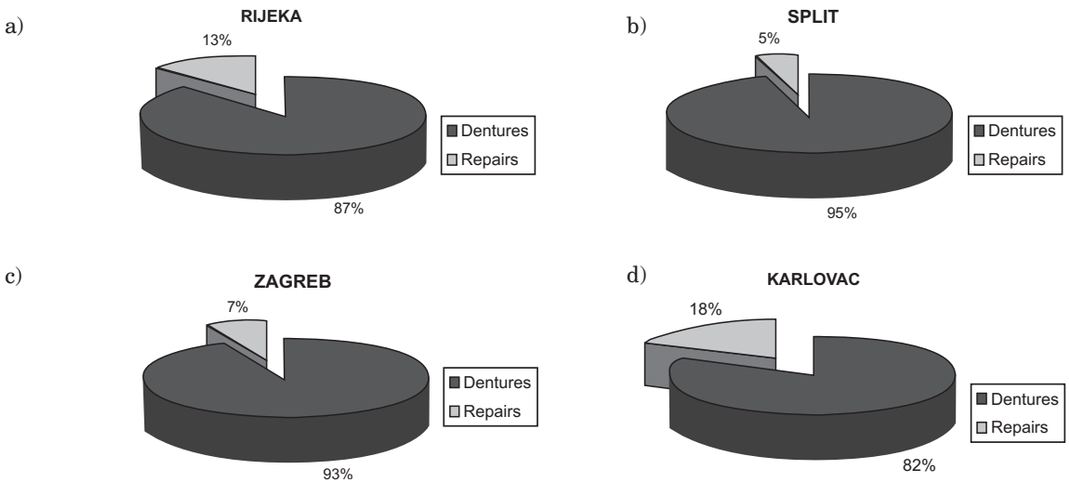

Fig. 1. Percentage of denture repairs in different districts of Croatia in relation to new denture deliveries: a) Rijeka, b) Split, c) Zagreb and d) Karlovac.

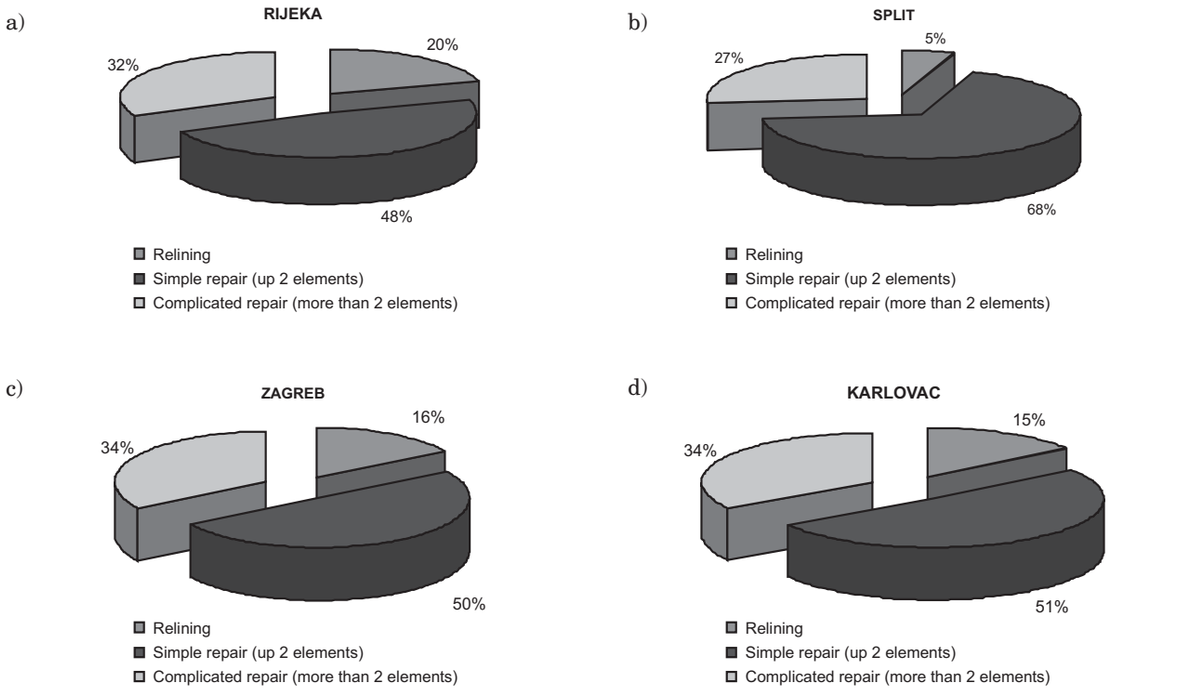

Fig. 2. Types of denture repairs in different districts of Croatia: a) Rijeka, b) Split, c) Zagreb and d) Karlovac.

tasks if a denture is miss fitting on a denture bearing area due to residual ridge resorption and a long time denture wearing[15].

Considering a need for relining two factors have to be considered: miss fitting denture due to its construction and residual ridge resorption due to long-term denture wearing[15,16].

Complicated repairs (broken clasp, fractures, tooth loss, and other examples with a repair of more than 2 elements) could be due to technical and/or biological reasons.

The likelihood that an acrylic resin RDs may, in future, require a further simple repair can be reduced using glass-fiber reinforcement during a repair procedure. This occurrence cannot be entirely prevented, however because some fractures appear due to misfit or suboptimal teeth arrangement or suboptimal jaw relationship and occlusion[16]. Midline fractures appear to be the most common type of failure of maxilllary complete dentures, these can be reduced also by reinforcement of the base material or use of a metal base[17–19].

Several investigations have concluded that a substantial number of patients show functional problems in wearing complete dentures after a certain period of time, this may be due to the gradual loss of alveolar bone, but many repairs are needed due to incorrect dentures delivered to a patient[20].

Investigations in Germany showed that 20% of all clasp-retained dentures had technical complications during the period of 4.2±1.7 years[21].

Percentage of repairs in each district, and the type of denture repairs are negatively correlated with the number of prosthodontic teams in relation to a population of the region. Karlovac had the smallest number of specialist prosthodontic teams and Split and Zagreb the highest number of specialists of prosthodontics in relation to a number of inhabitants of the region.

Due to changes in the amount of curriculum time available for teaching removable denture construction to undergraduate and postgraduate students, course content requires reconsideration and possible modification[20,22,23]. The suggestion to reduce or exclude training in the specialization of prosthodontics from dental education in Europe due to the reducing number of edentulous people in the population[24] and the trend to transfer the tasks of denture production to general dentists may not be advisable. Poor quality dentures are more likely to require repairs in future. The repair costs in a population with a high level of tooth loss may be greater than a cost of training specialists. The cost for the RDs and their repairs are normally covered by the Croatian Health Insurance, thus few patients use the service in a private practice where they are obliged to pay the whole cost. Therefore, it is likely to be reasonable to make an assumption that the data from the Croatian Health Insurance are representative of the denture wearing portion of Croatian population.

Removable dentures are a major part of dentistry, and will be for the foreseeable future.

Conclusion

Removable denture repairs were negatively correlated with the number of prosthodontic specialist teams in proportion to a number of inhabitants of each region, which means with the quality of dentures. Therefore education and training in prosthodontics (specialization) should not be eliminated from the dental curriculum.

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UČESTALOST REPARATURA ZUBNIH PROTEZA U ODNOSU NA BROJ SPECIJALISTIČKIH PROTETSKIH TIMOVA U HRVATSKOJ

SAŽETAK

Cilj ovog rada bio je utvrditi učestalost reparatura zubnih proteza u različitim regijama u Hrvatskoj u 2002. godini, kao i analizirati postotak različitih reparatura (podlaganje, jednostavne reparature do 2 elementa, kompliciranе reparature preko 2 elementa) u odnosu na broj specijalističkih protetskih timova. Informacije o broju predanih proteza, kao i o broju i vrsti reparatura za regiju Zagreb, Rijeka, Karlovac i Split dobivene su od strane hrvatskog Fonda za zdravstveno osiguranje. Također su prikupljene informacije o broju specijalista protetike u istim regijama. Najveći postotak reparatura u odnosu na broj predatih proteza zabilježen je u Karlovcu: 18%, a najmanji postotak u Splitu: 5%. Signifikantno najmanji postotak podlaganja proteza zabilježen je u Splitu, a najveći u Rijeci (χ^2=36,7; p<0.01). Najmanji postotak jednostavnih reparatura zabilježen je u rijeci, a najveći u Splitu (χ^2=24.3; p<0.01). Najmanji postotak kompliciranih reparatura zabilježen je u Splitu, a najveći u Karlovcu. Postotak reparatura, kao i vrsta reparature u korelaciji su sa brojem protetskih timova u regiji. Karlovac, sa namanjim brojem specijalista protetike ima najveći broj reparatura.