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The impact of rehabilitation using removable partial dentures and functionally orientated treatment on oral health-related quality of life: A randomised controlled clinical trial

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ARTICLE INFO

Article history:
Received 11 February 2014
Received in revised form
17 June 2014
Accepted 18 June 2014

Keywords:
Quality of life
Elderly
Prosthodontics
Partially dentate

ABSTRACT

Objectives: This study aimed to compare two different tooth replacement strategies for partially dentate older patients; namely functionally orientated treatment according to the principles of the shortened dental arch (SDA) and conventional treatment using removable partial dentures (RPDs) using a randomised controlled clinical trial. The primary outcome measure for this study was impact on oral health-related quality of life (OHRQoL) measured using the short form of the oral health impact profile (OHIP-14).

Methods: Patients aged 65 years and older were randomly allocated to two different treatment groups: the RPD group and the SDA group. For the RPD group each patient was restored to complete arches with cobalt–chromium RPDs used to replace missing teeth. For the SDA group, patients were restored to a premolar occlusion of 10 occluding pairs of natural and replacement teeth using resin bonded bridgework (RBB). OHRQoL was measured using the OHIP-14 questionnaire administered at baseline, 1 month, 6 months and 12 months after treatment intervention.

Results: In total, 89 patients completed the RCT: 44 from the RPD group and 45 from the SDA group. Analysis using a mixed model of covariance (ANCOVA) illustrated that treatment according to the SDA concept resulted in significantly better mean OHIP-14 scores compared with RPD treatment ($p < 0.05$). This result was replicated in both treatment centres used in the study.

Conclusions: In terms of impact on OHRQoL, treatment based on the SDA concept achieved significantly better results than that based on RPDs 12 months after treatment intervention (trial registration no. ISRCTN26302774).

Clinical significance: Functionally orientated treatment delivery resulted in significantly better outcomes compared to removable dentures in terms of impact on OHRQoL.

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http://dx.doi.org/10.1016/j.jdent.2014.06.006
0300-5712/

1. Introduction

Increasingly it is recognised that purely clinically based indictors of disease are insufficient when assessing health status and treatment outcomes. In the case of chronic disease without cure, amelioration of symptoms is a key therapeutic goal and this cannot be defined by objective criteria alone. The so-called ''disability paradox'', manifested in studies reports that patients with serious illness often rate their quality of life as better than healthy individuals.[1,2] Adaptive capacity and personal characteristics appear to have a significant influence patient's response to chronic disease. This can result in reports which seem counterintuitive, for example, the finding in a large German survey that having fewer than nine teeth had more impact on health-related quality of life than having cancer, hypertension, or allergy.[3] It is, therefore, important to incorporate subjective assessment methods when evaluating the impact of chronic disease, and the treatment interventions for managing the symptoms of those diseases.

In 2001, the Institute of Medicine proposed a number of specific aims to improve the quality of care for all patients. One of these aims was to ensure that care was ''patient-centred''. It was suggested that to promote patient-centred care, clinicians should measure the health status of their patients using standardised questionnaires and use this information to inform clinical decision making.[4] As a result, a variety of health status measures have subsequently been developed largely through work carried out in the social sciences.[5] These include general surveys and condition specific questionnaires. The oral health impact profile (OHIP) is a widely reported and validated tool used to capture oral health-related quality of life (OHRQoL) particularly amongst older adults.[6–8] The measure contains statements divided into seven theoretical domains, namely functional limitation, pain, psychological discomfort, physical disability, psychological disability, social disability and, handicap.[9] Originally a 49 item questionnaire, further work has developed a shortened version of the OHIP made up of a subset of 14 items taken from the original. Regression analysis of an epidemiological study conducted in Southern Australia yielded an optimal set of 14 questions. The study indicated that the short form of the OHIP (OHIP-14) had good reliability, validity and precision.[6]

The aim of this study was to compare two different tooth replacement strategies for partially dentate older patients; namely functionally orientated treatment according to the principles of the shortened dental arch (SDA) and conventional treatment using removable partial dentures (RPDs). The primary outcome measure for this study was impact of the treatments on OHRQoL measuring using OHIP-14. The null hypothesis for the study stated that patients treated according to the principles of the SDA would be no worse off than those treated using RPDs in terms of impact on OHRQoL.

2. Materials and methods

2.1. Study design

A randomised controlled clinical trial (RCT) of partially dentate older patients (>65 years) was conducted (Fig. 1). Patients were included in the study if they were seeking replacement of missing natural teeth, had a minimum of six remaining natural teeth in both arches of good prognosis, could accept routine dental care in a dental chair, could communicate in English and had no medical conditions which precluded routine dental treatment. Full ethical approval was granted for the study from the Cork Teaching Hospitals Ethics Committee (ref: ECM 5 (9) 05/02/08). Each patient was provided with written information detailing the proposed treatment involved and each patient completed a written consent form prior to treatment. Patients were recruited from two centres: Cork University Dental Hospital (CUDH) and St Finbarr's Geriatric Day Hospital (SFDH) in Cork, Ireland. Those patients in SFDH represented a more systemically unwell and older cohort as they attended the Geriatric Day Hospital to receive a range medical treatments.

2.2. Randomisation

Patients were randomly allocated to two different treatment groups: the RPD group and the SDA group. Randomisation was performed using a computer generated schedule in SAS®. Randomisation was in blocks of varying length and was stratified according to age and gender. Separate randomisation schedules were generated for both recruitment site and the treatment groups included patients recruited from both centres, randomised independently. Patient randomisation was conducted by a research assistant and the allocation was concealed from the clinical operator.

2.3. Operative care

At the outset of treatment all patients received standardised dental care to render them dentally fit including extraction of hopeless teeth, restoration of carious lesions and non-surgical periodontal treatment. Each patient in the RPD group was restored to complete arches with RPDs using cobalt–chromium frameworks used to replace missing teeth. Each RPD was provided according to a standardised protocol which included primary and secondary impressions, surveying of mounted casts and framework design according to best prosthodontic principles. For the SDA group, patients were restored to a premolar occlusion of 10 occluding pairs of natural and replacement teeth using resin bonded bridgework (RBB) throughout the arch. Posterior teeth distal to the SDA were left unopposed. The RBB was provided using a standardised protocol in each case. Minimal tooth preparation within enamel only was carried out to produce retentive forms and increase the surface area for bonding. All of the RPDs and RBB were constructed by the same dental laboratory. All operative treatment was conducted by a single clinician with postgraduate training in prosthodontics.

2.4. Data collection

OHRQoL was measured using the OHIP-14 questionnaire. The questionnaire was administered by a research nurse at baseline, 1 month, 6 months and 12 months after treatment intervention. The reference period used in all cases was 1 month i.e. all of the questions asked began with the stem