

Overdentures may have little impact on nutrient status

Abstracted from

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Question: Does overdenture treatment provide greater improvement in nutrient intake and nutritional status than treatment with a conventional denture?

Data sources Data sources Medline, Embase and the Cochrane Central Register of Controlled Trials (CENTRAL).

Study selection Randomised control trials (RCTs), cohort study or case control studies involving prosthetic treatment where the outcomes included change in intakes of macronutrients (ie proteins, fats and carbohydrates) and/or micronutrients (eg vitamins and calcium) and/or indicators for nutritional status were considered.

Data extraction and synthesis Two reviewers independently screened the studies, with one reviewer abstracting data for checking by a second reviewer. Risk of bias was assessed independently by two reviewers using the Cochrane risk of bias tool. A fixed effects model was used to estimate the weighted mean difference (WMD) and 95% CI for change in body mass index (BMI), albumin and serum vitamin B12 between overdenture and conventional denture six months after treatment.

Results Eight studies (six RCTs and two prospective cohort studies) involving a total of 901 patients were included in a narrative synthesis. Three RCTs (322 patients) contributed to a meta-analysis suggesting no significant difference in change in BMI between an overdenture and conventional denture six months after treatment WMD= -0.18 kg/m² (95%CI; -0.52 to 0.16), and no significant difference in change in albumin or vitamin B12 between the two treatments.

Conclusions The modifying effect of overdenture treatment on nutritional status might be limited. Further studies are needed to evaluate the effectiveness and efficacy of denture treatments.

Commentary

This is one of most comprehensive non-Cochrane systematic reviews I came across in the past few years. All aspects of the review were done according to PRISMA¹ and succinctly and eloquently phrased to give the reader the status quo of the relationship between nutrition and the type of complete denture according to the best available evidence.

The systematic review (SR) started with an interesting overview of the existing knowledge regarding the differences between conventional complete dentures (COD) and implant-supported overdentures (IOD) in aspects like stability, retention and food choices. However, the authors stumbled upon an area that became the focus (ie the PICO) of the SR: in edentulous patients, which of the two treatment modalities would result in better nutrient intake (macronutrients and micronutrients) or markers for nutritional status (body mass index, (BMI), Mini Nutritional Assessment, (MNA) and albumin)?

In order to answer the question, the authors comprehensively searched Medline, Embase and the Cochrane Central Register for Controlled Trials (CENTRAL) without language restriction. However, there was no mention of searching unpublished studies, reference lists, or personal contact with experts (except to obtain additional information on some of the already retrieved studies).

The following criteria were set for eligibility of the literature: human subjects in randomised controlled studies (RCT), cohort studies, or case-control studies. Although it is not recommended to combine several study designs in a single SR, it is sometimes inevitable given the expected scarcity of the available literature. Also, there was no mention of criteria related to the characteristics of the participants with regards to age or health status. The primary outcome measures were 1) change in intake of macronutrients (ie proteins, fats and carbohydrates) and/or micronutrients (eg vitamins and calcium) and 2) BMI, MNA and albumin, which are commonly used screening markers for nutrition.² Change in masticatory performance, denture stability and oral health-related quality of life or food choices were considered secondary outcomes.

There was evidence of reproducibility throughout the SR. Two reviewers independently conducted the following steps: 1) screening of the titles and abstracts for initial eligibility, 2) data extraction and 3) assessment of risk of bias (more below). Inter-examiner reliability was reported only for the first step, while resolving disagreement was explained for the other two steps.

Risk of bias for RCTs was conducted using the Cochrane

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Collaboration's tool³ which covers the following areas: 1) random sequence generation, 2) allocation concealment, 3) blinding, 4) completeness of outcome data, 5) selective reporting and 6) other sources of bias. However, they did not mention using other tools for the two cohort studies they included.

Out of 108 eligible studies, only eight qualified for the final inclusion in the study. The eight studies were narratively appraised. For macronutrients intake four studies assessed change in protein intake but found no significant differences. One study reported significant decreases in total fat within groups but not between groups. Only five studies assessed micronutrients intake. However, none of the five studies found any differences in micronutrients intake within or between groups. Four studies assessed changes or differences in BMI. Only one study (an RCT) found a decrease in BMI for both the overdenture and conventional groups.

Of the eight included studies, only three studies (RCTs) were included in the final quantitative analysis (ie meta-analysis). The three studies provided information on BMI, albumin and vitamin B12. There was no significantly different change between IOD and COD regarding BMI, albumin or vitamin B12. No heterogeneity was observed.

Only five studies reported the secondary outcomes. One study reported that IOD increased denture satisfaction as well as oral

health-related quality of life. The other four studies reported that IOD provided more food choices than COD.

So where do we go from here? Based on the findings of the SR in hand, there was no difference between IOD and COD in improving nutrient intake and/or nutritional status. This seems to contradict conventional wisdom which would be in favour of IOD because they give the patients better food choices as shown in this review. Longer observation periods with more controlled settings might help provide a better insight on the role of these two treatment modalities on nutrient intake and the overall nutritional status of our patients.

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- 1 Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *BMJ* 2009; **339**: b2535, doi: 10.1136/bmj.b2535
- 2 Ahmed T, Haboubi N. Assessment and management of nutrition in older people and its importance to health. *Clin Interv Aging* 2010; **5**: 207-216.
- 3 Higgins JPT, Altman DG. Assessing risk of bias in included studies. In: Higgins JPT, Green S, eds. *Cochrane handbook for systematic reviews of interventions*. pp. 187-241. Wiley; 2008.

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