

Nitrogen balance after prosthetic rehabilitation of complete edentulous patients with fixed prosthesis or implant retained overdenture

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Registration date 30/03/2012	Overall study status Completed	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
Last Edited 26/05/2017	Condition category Oral Health	<input type="checkbox"/> Individual participant data <input type="checkbox"/> Record updated in last year

Plain English summary of protocol

Background and study aims

Patients who wear conventional dentures (false teeth) may have chewing difficulties if the dentures don't fit properly, which may affect their desire and ability to eat. This can lead to an unbalanced diet and low nutrient intake. Studies have shown that the ability of patients with dentures to chew improves when the lower denture is fully or partly supported by endosseous implants - surgical components that interface with the bone of the jaw. The aim of this study was to assess the impact of implant-supported overdentures on chewing and nutrition.

Who can participate?

Patients aged 54-79 who wear conventional dentures

What does the study involve?

Participants are randomly allocated to wear either implant-supported overdentures or conventional dentures. Their diet is assessed and urine samples are collected in a special container over a 24-hour period to measure their protein intake.

What are the possible benefits and risks of participating?

Not provided at time of registration

Where is the study run from?

Free Center of Dentistry (Brazil)

When is the study starting and how long is it expected to run for?

January 2011 to December 2011

Who is funding the study?

Free Center of Dentistry (Brazil)

Who is the main contact?

Dr Sergio Motta

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Contact information

Type(s)

Scientific

Contact name

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Additional identifiers

Protocol serial number

N/A

Study information

Scientific Title

A randomised controlled trial comparing nitrogen balance after prosthetic rehabilitation of complete edentulous patients with fixed prosthesis or implant retained overdenture

Study objectives

Complete edentulous patients wearing conventional dentures generally show chewing difficulties due to ill-fitting dentures may profoundly influence ones desire and ability to eat properly. It has been suggested that these factors can lead to an unbalanced diet and deficient nutrient intake. Studies have shown that the ability of edentulous patients to chew most foods improves significantly when the mandibular denture is fully or partly supported by endosseous implants. Complete denture wearers have been shown to have significant differences in nitrogen intake when compared to patients that received implant-supported overdenture.

The purpose of the current study was to clarify the objective impact of implant-supported overdentures on mastigatory performance, nutritional state and nutritional habits. The research questions evaluated were:

1. Whether implant supported overdentures provide greater improvement in mastigatory performance compared to conventional dentures
2. If implant supported overdentures impact food selection
3. Whether implant supported overdentures provide higher protein intake and improved protein utilization

Nitrogen Balance (NB) is an important calculation for assessing nutritional response and it is used to evaluate the adequacy of protein intake as well as to estimate current protein requirements.

The results showed that stability of the mandibular implant-retained overdenture was enhanced compared to a conventional denture as well as the quality of life and satisfaction levels. Seventy-five percent of patients changed their nutritional pattern, has been evidenced by the 24-hour dietary test. This change led to a substantial increase in protein intake and, as a consequence, to a improved nitrogen balance.

Ethics approval required

Old ethics approval format

Ethics approval(s)

The ethics approval was not sought because it is a verification of the efficiency of removable prosthesis implant. This is not an experimental study.

Study design

Randomized controlled trial

Primary study design

Interventional

Study type(s)

Treatment

Health condition(s) or problem(s) studied

Prosthodontics

Interventions

Subjects received either implant-supported denture (ISD) or tissue-implant-supported denture (TISD)

The 24-hour dietary recall method was selected to measure dietary intake of the patients in the current survey. This was based on a review of the literature, which has used the 24-H- RQ method. Twenty-four hour urine collection was performed in order to estimate protein metabolism by collecting a person's urine in a special container over a 24-hour period.

Evaluation of protein metabolism

There was no change in the treatment and diet of patients during the course of the study. On the test day, in the morning at the commencement of collection period (6.00 a.m.) patients were asked to void urine and discard this sample (as it contains the overnight urine present in the bladder). Subsequently urine was collected for next 24 hrs. The last sample was to be collected on next day at 6.00 a.m. A random sample was also collected at around 11.0 a.m. on the day of deposition of 24 hr sample (the test day).

Nitrogen balance trial

Nitrogen excretion is determined by certain factors, mainly crude protein content of diet. Nitrogen balance trials are not only used to determine amino acid requirement, but also for the best amino acid ratio (Hahn and Baker, 1995). A nitrogen balance trial was carried out with 4 patients. The values of nitrogen intake (NI), output in feces (NOF) and in urine (NOU) were

calculated by multiplying nitrogen levels of diets, feces and urine, by feed intake, excreted feces and urine, respectively. Nitrogen absorption ($NAB = NI - NOF$), total output ($TNO = NOF + NOU$), retention ($NR = NI - TNO$), net protein utilization ($NPU = NR/NI$) and the biologic value of feed protein ($BVFP = NR/NAB$) were subsequently calculated. The values of nitrogen intake (NI), output in feces (NOF) and in urine (NOU) and UUN are the nitrogen production during the 24-hour period.

Intervention Type

Other

Phase

Not Specified

Primary outcome(s)

Nitrogen Balance (NB) for assessing nutritional response and to evaluate the adequacy of protein intake as well as to estimate current protein requirements

Key secondary outcome(s)

1. Patient overall satisfaction: Was significantly higher for the mandibular overdenture. In addition, mandibular overdenture patients were significantly more satisfied with chewing experience and retention of the lower denture. conversion from a lower conventional complete denture to an implant-retained overdenture increased retention of the prosthesis
2. Improvement in masticatory performance
3. Protein ingestion: limited effect has been observed

Completion date

01/12/2011

Eligibility

Key inclusion criteria

1. Aged 54-79
2. Bimaxillary edentulous patients wearing conventional dentures and without deglutition problems
3. Informed written consent

Participant type(s)

Patient

Healthy volunteers allowed

No

Age group

Senior

Sex

All

Key exclusion criteria

Sera of patients with compromised metabolic health with chronic diseases

Date of first enrolment

01/01/2011

Date of final enrolment

01/12/2011

Locations

Countries of recruitment

Brazil

Study participating centre

Rua Barão de Flamengo 22

Rio de Janeiro

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Sponsor information

Organisation

Free Center of Dentistry (Brazil)

Funder(s)

Funder type

Hospital/treatment centre

Funder Name

Free Center of Dentistry (Brazil)

Results and Publications

Individual participant data (IPD) sharing plan**IPD sharing plan summary**

Not provided at time of registration

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes