JOURNAL OF DENTISTRY 42 (2014) 664–670

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.intl.elsevierhealth.com/journals/jden

Prevalence of xerostomia and hyposalivation and their association with quality of life in elderly patients in dependence on dental status and prosthetic rehabilitation: A pilot study

Sebastian Hahnel [a,*], *Simone Schwarz* [a], *Florian Zeman* [b], *Lina Schäfer* [a], *Michael Behr* [a]

[a] *Department of Prosthodontics, Regensburg University Medical Center, Regensburg, Germany*
[b] *Centre for Clinical Trials, Regensburg University Medical Center, Regensburg, Germany*

ARTICLE INFO

Article history:
Received 23 September 2013
Received in revised form
4 February 2014
Accepted 6 March 2014

Keywords:
Xerostomia
Hyposalivation
Quality of life

ABSTRACT

Objectives: The aims of this pilot study were to investigate the prevalence of xerostomia and hyposalivation and their impact on quality of life in a cohort of elderly patients including dental status and the character of potential prosthetic restorations as independent variables.

Methods: Patients aged 60 years or older without any objective or subjective need for prosthodontic treatment taking part in a regular recall programme were included in the trial. Quality of life was assessed using the German version of the GOHAI; prevalence and severity of xerostomia was investigated using the shortened version of the Xerostomia Inventory (XI). Stimulated salivary flow rate was determined using a sialometric approach. Dental status and the character of prosthetic restorations (no/fixed restorations and removable but tooth-supported dentures vs. gum-supported dentures) were assessed in a clinical examination by experienced dentists specialized in prosthodontic treatment.

Results: A total of 68 patients were included in the trial; a prevalence of xerostomia of 16% and a prevalence of hyposalivation of 31% were identified. The quality of life in the study cohort decreased significantly as a function of xerostomia severity but not salivary flow; moreover, a significant impact of the number of teeth/implants in the upper jaw and the presence of gum-supported dentures in both jaws on GOHAI scores could be identified.

Conclusions: Within the limitations of a pilot study, the results support the assumption that the quality of life in elderly patients is particularly related to their subjective perception of xerostomia. A decline in salivary flow, the dental status and the character of prosthetic restorations appear to play a subordinate role for the quality of life in elderly patients.

Clinical significance: The quality of life in elderly patients may be severely diminished due to an increased subjective perception of dry mouth. Dental treatment should focus on alleviating xerostomia, whereas the impact of dental status and prosthetic restoration appear to be subordinate.

* *Corresponding author at*: Department of Prosthodontics, Regensburg University Medical Center, 93042 Regensburg, Germany. Tel.: +49 9419446059; fax: +49 9419446171.
E-mail address: Sebastian.Hahnel@ukr.de (S. Hahnel).

http://dx.doi.org/10.1016/j.jdent.2014.03.003
0300-5712/

1. Introduction

Numerous people suffer from dry mouth, and previous epidemiological studies highlighted that its prevalence even increases with age.[1,2] In fact, in patients older than 60 years, it has been estimated that by far more than 30% suffer from dry mouth in dependence on the methodology applied for its estimation,[1,3,4] whereas the overall prevalence ranges between 7% and 29%.[5,6] The correlation between the prevalence of dry mouth and age is – in many causes – caused by the consumption of xerogenic drugs affecting either perception or secretion of saliva; other causes of ''dry mouth'' in elderly patients include autoimmune diseases or radiation therapy of malignancies. A decreasing production of saliva by the salivary glands with increasing age is, however, still controversially discussed.

Although numerous studies investigated the prevalence of ''dry mouth'' in elderly patients, only very few of them employed a scientifically sound approach towards the epidemiological evaluation of dry mouth.[7] The terms *xerostomia* and *hyposalivation*, which may be regarded as the scientifically correct definitions of the subjective (xerostomia)[8] and objective (hyposalivation) component of dry mouth, are frequently employed as synonyms. Patients suffering from xerostomia do not necessarily have hyposalivation,[9] which underlines that both the subjective and the objective implications of dry mouth need to be determined in a scientifically valid approach. For the determination of xerostomia as the subjective perception of dry mouth, a questionnaire labelled *Xerostomia Inventory* has been introduced in the recent years,[9,10] which was actually the first scientifically validated tool to investigate the prevalence of xerostomia. For the analysis of hyposalivation, however, the measurement of salivary flow rate is commonly accepted as a simple and reproducible means to determinate either unstimulated or stimulated salivary flow.

The conventional wisdom is that both xerostomia and hyposalivation may limit the quality of life of the affected individuals. In elderly patients, previous studies have identified problems with daily routine as the most frequent complaint associated with xerostomia, including problems with speaking, chewing and biting.[4,11] However, the character and quality of prosthetic restorations and their relation to the quality of life in patients suffering from xerostomia and/or hyposalivation have almost been ignored. Particularly removable denture prostheses cover the marginal and gingival areas of the toothless jaw areas and, in dependence of the number of residual abutment teeth or implants, require saliva as a lubricant and agent for denture retention. The latest national study on oral health issues in Germany revealed that complete dentures are worn by more than 22% of the persons older than 65 years,[12] which indicates that prosthetic rehabilitation of patients with removable denture prostheses is still common. With regard to the diminished availability of saliva in patients with hyposalivation, it can be controversially discussed whether these patients have a reduced quality of life in comparison to patients with no or fixed dentures, and also whether it should be recommended to avoid supplying these patients with removable prostheses at all. Although the authors of a recent review on this topic could not identify sufficient scientific evidence for this assumption as a result of the lack of clinical studies,[13] it is likely that particularly in patients suffering from either xerostomia or hyposalivation or both, the number of residual teeth and the character of a prosthetic restoration impacts their quality of life.

The primary aim of this clinical study was to elucidate the prevalence of xerostomia and hyposalivation in a cohort of elderly patients taking part in a regular recall programme and to investigate the impact of xerostomia severity and salivary flow on their oral health-related quality of life. The primary study hypothesis was that the quality of life diminishes with an increased perception of xerostomia and decreased salivary flow. In addition to that, dental status and character of potential prosthetic restorations were included as independent variables in regression analyses, as we hypothesized that the quality of life in patients wearing removable or gum-supported dentures is lower than in patients with no or fixed prosthetic restorations or tooth-supported removable restorations.

2. Materials and methods

2.1. Study design

The study was performed at the Department of Prosthodontics of the University Medical Center Regensburg, Germany, between January and December 2012. Patients aged 60 years or older, who took part in a regular recall programme offered by the Department of Prosthodontics and had not received prosthodontic treatment for at least 6 months, were asked to participate in the study. Patients suffering from dementia or temporomandibular disorders were excluded, as were patients consuming drugs or saliva substitutes for alleviating xerostomia or hyposalivation. Acquisition of data was performed at a single occasion during a regular recall appointment. All patients were examined by an experienced dentist specialized in prosthodontics; only patients with no objective need for any prosthetic treatment were included in the study.

The study design was approved by the local ethics committee of the University of Regensburg (no. 11-101-0315). All patients gave their written consent to participate in the study.

2.2. Determination of quality of life

Quality of life was determined employing the German version of the *Geriatric Oral Health Assessment Index* (GOHAI).[14,15] Data were collected using a Likert-type scale. Each item in the GOHAI had a scoring range from 1 to 5, corresponding with ''never'', ''seldom'', ''occasionally'', ''frequently'' and ''very often''. The participating patients' responses to the items were summed up; high GOHAI sums correspond to lower quality of life. Cronbach's alpha indicated an internal consistency of .64 for the GOHAI data.

2.3. Assessment of xerostomia

Xerostomia as the subjective perception of dry mouth was assessed using the shortened Xerostomia Inventory