

Proceeding Paper

# Hyposalivation and Xerostomia: Prevalence and Associated Factors in the Elderly <sup>†</sup>

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**Abstract:** In the elderly, many chronic diseases and systemic conditions, medications, and salivary dysfunctions, mostly caused by therapeutic radiation and chemotherapy, are associated with hyposalivation and xerostomia, affecting quality of life. The purpose of this study was to identify and evaluate potential factors associated with xerostomia and/or hyposalivation in a local elderly population. Almost half of the participants had hyposalivation and some reported xerostomia. There was a significant association between hyposalivation and xerostomia. Hyposalivation was most common among women, those taking one or more types of medication simultaneously, those taking antidepressants, and participants with rheumatoid arthritis and depression. There was a tendency for individuals with poorer oral-health-related quality of life to exhibit hyposalivation.

**Keywords:** xerostomia; hyposalivation; geriatrics



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## 1. Introduction

In the elderly, several chronic diseases and systemic conditions, such as autoimmune diseases, polymedication, and salivary dysfunction, mostly caused by therapeutic radiation and chemotherapy, are associated with reduced salivary flow [1]. Xerostomia is defined as the perception of dry mouth, whereas hyposalivation is the objective reduction in salivary flow [2]. However, both conditions can cause signs or symptoms that affect quality of life [1,3]. The purpose of this study was to identify and evaluate potential factors associated with xerostomia and/or hyposalivation in a local elderly population.

## 2. Materials and Methods

A total of 150 elderly participants, aged 65 years or older, were included in this study, which was carried out at the Egas Moniz Dental Clinic between December 2021 and May 2022. Sociodemographic data, general health status data, Summated Xerostomia Inventory (SXI-PL) scores, and Geriatric Oral Health Assessment Index (GOHAI) scores were obtained via a questionnaire. Hyposalivation was assessed by calculating the rate of stimulated (<0.7 mL/min) and unstimulated (<0.1 mL/min) salivary flow using sialometry. The data were statistically analyzed using descriptive and inferential methodologies (chi-square and Mann–Whitney tests), by means of IBM SPSS Statistics v.27.0. A significance level of 5% was used in all inferential analyses.

### 3. Results

The majority of participants were female (60.0%) and the mean age was 72.9 ( $\pm 4.0$ ) years. Arterial hypertension was the most common systemic disease (60.7%). More than half were taking medication (86.0%), with antihypertensives being the most common (59.0%). Most participants were taking two or more types of medication at the same time (67.0%). Almost half of the participants had hyposalivation (48.7%) and 31.3% reported a 'dry mouth perception'. A significant association was found between hyposalivation and xerostomia perception ( $p < 0.05$ ). Hyposalivation was more common in women (52.2%); those simultaneously taking 1, 2, 3, or 5+ types of medication (41.9%, 53.3%, 60.6%, and 62.5%, respectively); and those taking antidepressants (57.1%). Participants with rheumatoid arthritis and depression were also more likely to have hyposalivation (60.0% and 66.7%, respectively). Although no significant association was found, there was a tendency for individuals with poorer oral-health-related quality of life to have hyposalivation (57.7%).

### 4. Discussion and Conclusions

Xerostomia and hyposalivation semiologically allow us to indicate the clinical and subclinical state of a patient. Hyposalivation was a very common condition in this study, which may be explained by the co-existence of some chronic diseases, such as rheumatoid arthritis or depression, the concomitant use of medication, or the atrophy of salivary gland tissue associated with ageing [1,2]. Some types of medication, such as antidepressants, can cause vasoconstriction in the salivary glands, altering their hydro-electrolyte balance, leading to changes in acinar cell function or glandular tubule structure [4]. Hyposalivation in female participants can be explained by the decrease in progesterone and estrogen due to the menopause, resulting in the salivary glands being unable to absorb these hormones [5]. Hyposalivation is a condition that promotes poorer quality of life in this age group and should be diagnosed and treated in order to improve the well-being of the elderly [3].

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**Data Availability Statement:** The data presented in this study are available on request from the corresponding author. The data are not publicly available as they are part of an ongoing study.

**Conflicts of Interest:** The authors declare no conflict of interest.

### References

1. Kim, Y.J. Xerostomia and Its Cellular Targets. *Int. J. Mol. Sci.* **2023**, *24*, 5358. [CrossRef]
2. López-Pintor, R.M.; Casañas, E.; González-Serrano, J.; Serrano, J.; Ramírez, L.; de Arriba, L.; Hernández, G. Xerostomia, Hyposalivation, and Salivary Flow in Diabetes Patients. *J. Diabetes Res.* **2016**, *2016*, 4372852. [CrossRef] [PubMed]
3. Barbe, A.G.; Schmidt, P.; Bussmann, M.; Kunter, H.; Noack, M.J.; Röhrig, G. Xerostomia and hyposalivation in orthogeriatric patients with fall history and impact on oral health-related quality of life. *Clin. Interv. Aging* **2018**, *13*, 1971–1979. [CrossRef]

4. Närhi, T.O.; Meurman, J.H.; Ainamo, A. Xerostomia and Hyposalivation: Causes, consequences and treatment in the elderly. *Drugs Aging* **1999**, *15*, 103–116. [[CrossRef](#)] [[PubMed](#)]
5. Eliasson, L.; Carlén, A.; Laine, M.; Birkhed, D. Minor gland and whole saliva in postmenopausal women using a low potency oestrogen (oestriol). *Arch. Oral Biol.* **2003**, *48*, 511–517. [[CrossRef](#)] [[PubMed](#)]

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