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Original paper

Oral Health and Frailty Syndrome in older people

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Abstract

The purpose of the study was to evaluate the role of oral health in frailty syndrome in older people. A total number of 135 older patients have been evaluated using Fried Frailty Scale and oral examination. A Fried Frailty Scale score of 2, representing pre-frailty, correlated (Pearson correlation coefficient r=+0.57, at a significance level 0.01) with the presence of oral cavity changes and it was influenced by age, a high degree of association was noticed between more than three oral cavity disorders and pre-frailty at a statistical significance level $p<0.001$ (Confidence Interval 99%, df=9). In conclusion, changes in the oral cavity could limit the ability of older people to follow a proper diet and could be a significant factor in favoring the occurrence of frailty syndrome in this age group through a complex effect.

Keywords Oral health, diet, aging, frailty syndrome.

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Introduction

Oral cavity is readily examined in older people and may demonstrate etiology of several disorders related to gastrointestinal tract [1]. They could interfere with eating and this might determine malnutrition and wasting illness. The number of general oral health conditions represents a strong predictor of involuntary weight loss in older people [2] and could be one important factor in favoring the occurrence of frailty syndrome in this age group. Moreover, oral health has an important impact on general health and wellbeing in older people. It might trigger depression because the loss of self-esteem due to loss of teeth and untreated caries and periodontal disease [3].

Oral health can affect an older person's capacity of being free of pain and discomfort, to maintain an adequate diet and to enjoy interpersonal relationships and to maintain a positive self-image. Frailty syndrome is a relatively recent described condition in persons beyond the age of 65 years [4, 5]. It renders older people more vulnerable to various risk factors. The patients diagnosed with this syndrome are more vulnerable to infectious diseases, they are more often admitted to hospital than their same age counterparts, have a longer hospital stay and a poorer prognosis, and higher risk of death. Consequently, it is important to diagnose early this group of patients and to identify factors that could favor the occurrence of this syndrome [6, 7].

Material and Method

We investigated a total number of 135 older patients using Fried Frailty Scale [4] and oral examination performed by a specialist. Oral health was evaluated by existence of natural teeth, dental prosthesis (removable or fixed) or uncorrected edentulous; presence of periodontal disease; self-reported oral health; oral pain while chewing; dry mouth; sensitivity to cold, hot or sweets; and difficulty with eating. Several covariates have been taken into account: age, gender, multimorbidities, neurocognitive function (Mini Mental State Examination [8] score lower than 26 was considered abnormal), smoking status and alcohol use, place of residence (rural or urban).

Female patients represented 61% of total and male patients were 39%. Age range was 60 to 105 years (mean 82.5 years). Age group distribution is presented in Figure 1. One can notice a higher prevalence of feminine gender in the general sample.

Analyzing age group distribution (Figure 2) we noticed a relative uniform distribution in the "young-old" group (younger than 75 years), then the percentage of patients by age group decreases progressively. The highest prevalence was noticed in subjects with ages between 70 and 74 years. Age groups 60-64, 65-69 and 75-79 years were nearly equal (percentage values have been rounded up). Advanced age groups (80-84 and 85 and over) had a balanced representation.

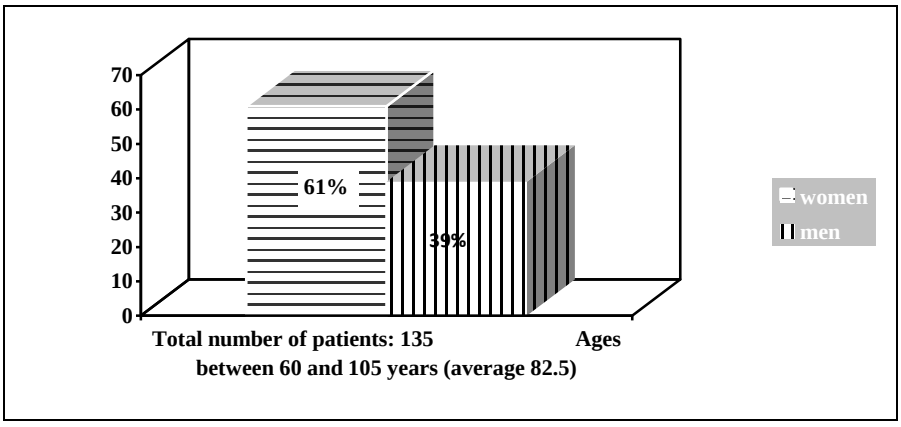

Figure 1. Gender distribution of the General Sample.

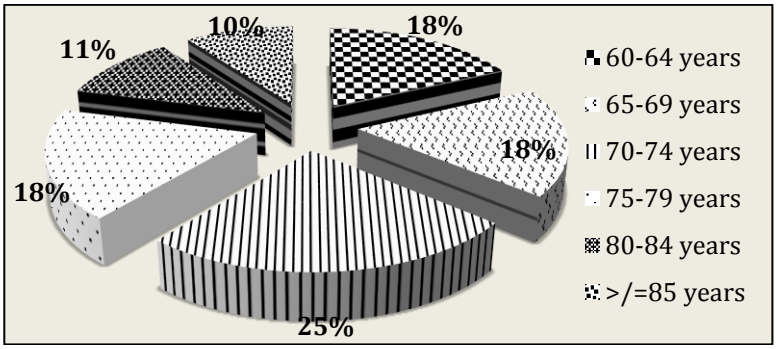

Figure 2. Age Group Distribution of the General Sample.

We analysed the age group of 60–64 years because they represent an important number in the general structure of the population in Romania where in 2011 the life expectancy at birth was 74.51 years, higher in women (78 years) and significantly lower in men (71 years) [9].

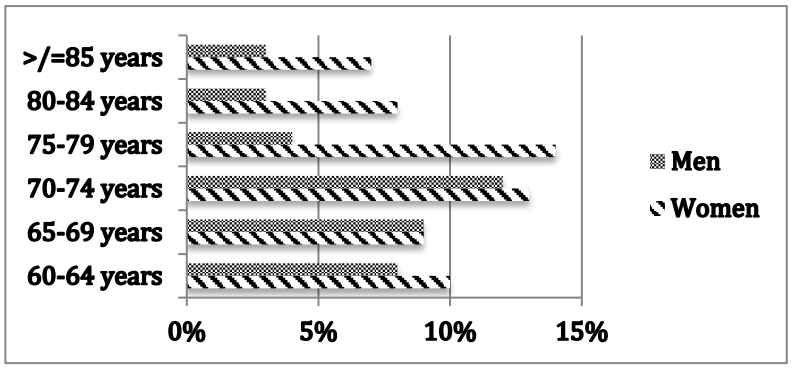

Figure 3. Age group and gender distribution sample (percentage of the total number of patients).

Age group and gender distribution (Figure 3) demonstrates again feminine gender predominance, higher as the age group increases. If in the age group 65-69 years the percentage of patients is nearly equal in both genders, at over 70 years we noticed an imbalance with a clear predominance of feminine gender, this being an expression of a higher life expectancy in women in Romania.

For feminine gender one can see a higher percentage of patients with ages between 70-74 years and 75-79 years (Figure 4), unlike the situation seen in masculine gender where the highest proportion is seen in 65-69 and 70-74 years (Figure 5). One can notice a "shift" of the maximal frequency of patients in feminine gender as compared to masculine with an average of 5 years. This aspect reflects again a higher life expectancy in women in our country.

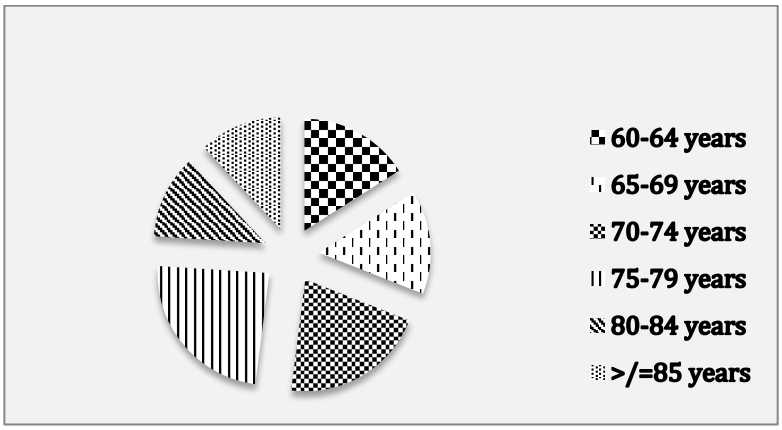

Figure 4. Female Patients Distribution by Age Groups.

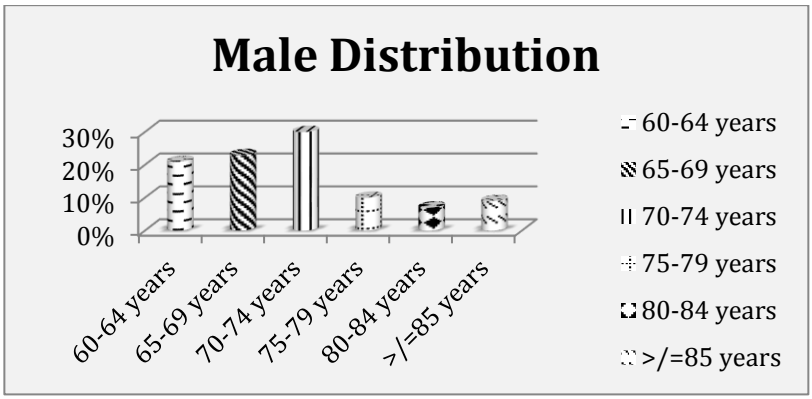

Figure 5. Male Patients Distribution by Age Group.

Results

No subject had a full dentition. Over 69% of patients had a removable of fixed dental prosthesis, prevalence increasing with age from 59% to 87%. Non-replaced missing teeth were noticed mainly in older age groups, males from rural areas (27%). Edentulous patients had a prevalence of 29%, and uncorrected edentulous patients had a prevalence of 27% of this group. Periodontal disease had a general prevalence of 29%. A total of 14% of patients reported sensitivity to cold, hot or sweets. Dry mouth was reported in subjects taking more than 4 medications concomitantly (prevalence 71%), especially antidepressants (selective serotonin reuptake inhibitors), alpha-blockers and/or diuretics.

Neurocognitive disorders were correlated with a higher prevalence of oral health problems and with frailty syndrome (r=+0.61%). Over 5 diseases in the same patient correlated with poor oral health and pre-frailty (Fried's score of 2) with a correlation coefficient r=+0.55. Smoking correlated with oral health problems and pre-frailty syndrome (correlation coefficient r=+0.59). Self-reported oral health problems did not correlate significantly with pre-frailty, but pain while chewing food correlated with involuntary weight loss as part of -pre-frailty and frailty syndrome (correlation coefficient r=+0.48).

Edentulous patients had a higher prevalence of pre-frailty and frailty syndrome as compared to those having dental prosthesis. A Fried Frailty Scale score of 2, representing pre-frailty, correlated (Pearson correlation coefficient r=+0.57, at a significance level 0.01) with the presence of oral cavity problems and it was influenced by age, a high degree of association was noticed between more than three oral cavity disorders and pre-frailty at a statistical significance level $p<0.001$ (Confidence Interval 99%, df=9).

Discussion

Diagnosing elderly patients with pre-frailty and frailty syndrome is important since it helps identify older subjects that are more vulnerable when exposed to risk factors [5, 6, 10, 11, 12]. Although older people with frailty and pre-frailty syndrome do not have a single decompensated disease, they present clinically with several conditions that generate a higher degree of vulnerability. These subjects are more prone to be admitted to hospital, if they are hospitalized they tend to have a poor evolution and outcome, and are at higher risk of death.

Several factors can increase the risk of developing pre-frailty and frailty syndrome in older subjects. They include post-traumatic stress [12, 13], use of several medications that could interfere with neurocognitive function [14], life-style factors [15] and various health conditions. In this study we investigated the influence of several oral health problems, demographic characteristics, and multimorbidities. Poor oral health is common amongst older people and has been associated with chronic diseases [16, 17, 18]. The results suggest that a poor oral health can have a significant influence on the occurrence of pre-frailty and frailty syndrome through a complex of interactions including a direct effect on nutrition and an indirect effect on favoring several diseases. Oral problems can affect the capacity of an older person of having a complete diet and can be followed by several nutritional deficits including involuntary weight loss, a component of frailty syndrome. The results are consistent with those from other studies that support the importance of preventing and treating oral health problems in older people [16, 17, 18].

Oral health conditions had a significant relation with frailty and its components, not only through a nutritional pathway of involuntary weight loss, but through a complex intervention, a poor oral condition being a risk factor for the onset of frailty.

Conclusions

The study demonstrates that changes in the oral cavity could limit the ability of older people to follow a proper diet and could be a significant factor in favoring the occurrence of frailty syndrome in this age group through a complex effect.

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