SUCCESSFUL AGING IS INFLUENCED BY FRAILTY AND HEALTH-RELATED QUALITY OF LIFE IN COMMUNITY-DWELLING SENIORS

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SUCCESSFUL AGING IS INFLUENCED BY FRAILTY AND HEALTH-RELATED QUALITY OF LIFE IN COMMUNITY-DWELLING SENIORS (Abstract): Successful aging at maintaining and enhancing elders’ health and functioning for as long as possible. Frailty, a new concept in medicine, was found to be the main cause of disablement and death, therefore it has an important influence on quality of life in these patients. **Aim:** To identify the prevalence of frailty in home-dwelling elderly and its influence on quality of life. **Material and methods:** The study was conducted on a group of non-hospitalized elderly (>65 years) without no prior hospitalization in the past 3 months who volunteered to take part in a geriatric assessment occasioned by the Day of Older Persons on October 1, 2016. Frailty was assessed using Fried phenotype, Groningen Frailty Indicator (GFI) and comprehensive geriatric assessment. SF-36 was used to assess the quality of life, and the participants were also asked to provide information on their medical history and medical treatments. **Results:** The study showed a low prevalence of frailty in non-hospitalized elderly people (27.77%), with higher scores recorded on GFI, but given the small sample size the correlations were not statistically significant. Quality of life was significantly decreased in the frail subjects both in terms of physical and mental function, with lower scores on the physical component. **Conclusions:** These findings suggest that early detection and intervention are essential for improving quality of life of frail elderly, one of the main elements of successful aging. **Keywords:** SUCCESSFUL AGING, FRAILTY, QUALITY OF LIFE, ELDERLY

Increasing life expectancy is a well-known global phenomenon, which has led to the increase in the elderly quota, that is of people over 65 years of age; unfortunately, this phenomenon is not accompanied by a proportional increase in the youth quota, in order to keep harmonious proportions between the active and the retired population, and therefore, over the last thirty years, we have been witnessing a new demographic phenomenon known as population aging. This situation has numerous consequences, on many different levels: economic, social, medical, spiritual, implicitly requiring the generation of new projects and policies to address the health of the elderly.

Successful aging is one of these projects, which aims at preserving, for as long as possible, an acceptable level of health for the elderly (1). To achieve this goal, each older person should be assessed by a
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geriatric multidisciplinary team that would develop an individual plan of measures to ensure a smooth transition and, if possible, without the interference of diseases, through the various stages of the physiological aging process. These individually tailored therapy plans have as end-goal the preservation of the quality of life and the physical, mental, spiritual, financial and social independence for if possible, trying to shorten to the maximum the final period burdened by suffering, sickness, disability and dependence (2, 3).

The prevalence and definitions of successful aging vary among studies (4); however, there is a consensus regarding its multidimensional nature, and one of the most important components is quality of life.

Quality of life (QOL) has an individual, multifactorial and dynamic nature. It is constantly related to past experiences and influenced by future expectations, which means that for an older person the quality of life changes its significance while aging (5). The Short Form-36 (SF-36) is a multidimensional scale and a well-established instrument that measures health concepts and self-reported quality of life (6).

Successful aging must also consider the degree of frailty of the elderly, an inherent phenomenon of progressive deterioration in the function of all body organs and systems, thus increasing the degree of vulnerability to various stress factors. Thus, frailty becomes a key element in ensuring successful aging. Initial studies focused on physical frailty because this was the most visible aspect in the physiological decline process, also having severe consequences on physical independence, increase in sedentary time and metabolic and cardiovascular diseases, increasing the degree of disability and the need for high-cost medical care (7). Subsequently, attention was drawn more to the phenomenon of mental and social frailty, which, in their turn can induce physical frailty (8). Evaluation of all elements of frailty is preferred in all recent studies.

Systematically applying the frailty scores to the elderly population would lead to the identification and classification of frailty in terms of stages; early intervention to combat this syndrome can make the difference between autonomy and dependence, between active and bedridden and, finally, between an optimal quality of life and the “burden of old age”. The authors of recent studies still consider the best assessment and classification of frailty as being the result of a comprehensive geriatric assessment (9, 11, 12).

The impact of frailty syndrome on the quality of life of the elderly has become a subject of interest. Recent studies focus on determining the degree of negative impact of frailty syndrome on the quality of life of the elderly, but also on determining the manifestation with the highest impact on the decrease in QOL (10, 11, 12).

MATERIAL AND METHODS

The study was conducted on a group of 36 elderly persons (aged over 65) registered with family doctors and who volunteered for a geriatric assessment occasioned by the Day of Older Persons on October 1, 2016. All participants signed an informed consent and were free to withdraw from the observational study at any time. This group included all elderly persons with no acute diseases at the time of the presentation and/or who were not hospitalized for acute events over the past 3 months.

The geriatric assessment tried to capture various aspects of each participant in order to achieve an appreciation that is as close as possible to reality and which to generate an individualized therapeutic plan. In this regard, the participants filled in the following questionnaires: SF-36 (for assessing the
QOL), EASY (for the assessment of frailty through the Groeningen test) (fig.1), MMSE scale (assessment of cognitive status), MNA (assessment of nutritional status), GDS depression scale (assessment of emotional status), ADL and IADL scales (assessment of the ability to participate in daily activities). Besides these questionnaires, the participants were asked to provide information on their past medical history and the medication they take at home (including OTC); also, the parameters that define sarcopenia were assessed and anthropometric measurements were performed to calculate the Fried fragility score (tab. I).

**TABLE I**

**Fried phenotype**

<table>
<thead>
<tr>
<th>Weakness</th>
<th>Grip strength &lt;20% in the dominant hand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slowness</td>
<td>&lt;20% for time to walk 4.5 m</td>
</tr>
<tr>
<td>Low level of physical activity</td>
<td>&lt;20% for calories expenditure</td>
</tr>
<tr>
<td>Exhaustion, poor endurance</td>
<td>Self-reported</td>
</tr>
<tr>
<td>Weight loss</td>
<td>Unintentional loss 4-5kg in 1 year</td>
</tr>
</tbody>
</table>

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**Fig.1. Groeningen test (25)**
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Using SF-36 to define successful aging is an acceptable tool because it assesses the overall health status in two directions: the physical component summary and the mental component summary, which are generally used to define health status.

The calculation of the Fried frailty score led to the division of the group into 3 subgroups:

- Subgroup 1 - robust elderly persons (20 people) - no Fried criteria;
- Subgroup 2 - pre-frail elderly persons (6 people) - 1-2 Fried criteria;
- Subgroup 3 - frail elderly persons (10 people) - 3 or more Fried criteria.

The data were loaded and processed with the help of statistical functions in SPSS 18.0: ANOVA test - descriptive indicators of the monitored parameters (minimum, maximum, average, standard deviation, standard error, variance, confidence interval 95%), FANOVA - quantitative test used to study the significant difference between mean values in two or more groups, the $\chi^2$ test - qualitative test that compares two or more frequency distributions in the same population.

RESULTS

The analysis of the demographic data indicated that patient age ranged from 65 to 89 years, mean age 75.5 years; most subjects (72.22%) were women, both in the initial group and in the 3 subgroups: 66.66% in subgroup 1, 100% in subgroup 2 and 60% in the subgroup with frailty. These results support the data in the literature showing a significantly increased prevalence of frailty among female population (13,14). But, other studies report no significant gender differences in the prevalence of fragility, but emphasize a higher risk of mortality in men with clinically manifest frailty (15).

The conducted study showed a low prevalence of frailty among the non-hospitalized elderly people (27.77%), but the small size of the study group does not allow us to determine statistically significant data.

High Groningen scores were recorded both in the subgroup of robust elderly people (50%) and in the subgroup of frail elderly people (80%). No statistically significant correlation was found between the two used screening methods ($p = 0.285$). By using two screening tools for frailty, different degrees of impairment in the study group were identified. Thus, we found a slight overvaluation of frailty by using the Groningen test. This tool is based on self-evaluation from the patient and is thus influenced by his/her perceived health status. The Fried score, though more succinct, includes quantifiable objective elements (muscle strength, walking speed decrease). Also, the ability to identify pre-frail subjects by using the Fried score extends its clinical utility, the measures for inducing the reversibility of frailty are believed to have the best result in the stage of pre-frailty.

The analysis of the questionnaire responses showed that the elderly enrolled in the study had no cognitive deficit and have a high degree of independence in carrying out daily activities. The GDS depression score was not significantly correlated with frailty ($p = 0.184$), but there was noted the prevalence of the depressed people in the subgroup of frail subjects (40%), which confirms the role of the emotional status in the emergence and aggravation of frailty syndrome, element often omitted by the screening tools currently available, but easily identifiable by a comprehensive
geriatric assessment. The depressive syndrome in the elderly has a negative impact on QOL, nutrition, hygiene and therapeutic compliance, but once identified it benefits from specialized treatment and counselling (16).

The analysis of the SF-36 questionnaires showed that the QOL score for the physical component ranged from 25.2 to 93 with a mean score of 65.022. No significant correlation with the Fried score was found, but a higher QOL level was found in the subgroup without frailty, and a significant decrease in those with frailty (fig. 1, 2). The score for the mental component ranged from 20.70 to 98.00, with a mean score of 69.58. There was no significant correlation with frailty, but there can be noted a low level QOL in the subgroups of pre-frail and frail subjects (fig. 3, 4).

**DISCUSSION**

Frailty syndrome was initially considered the prerogative of older people, being associated with and sometimes overlapping disability, the presence of concomitant chronic diseases and a high degree of de-
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pendence. However, the results of our study show no correlation between age and the increase in the degree of frailty, thus making a clear distinction between physiological aging and frailty syndrome, supporting the data in the literature (17,18).

Most authors (9, 10, 11) consider that there are three stages of frailty. The first stage, preclinical, corresponds to a state in which the body has sufficient physiological reserves to respond to external or internal aggression factors, such as the aggravation of a disease, trauma or stress. Preclinical frailty is completely reversible, being the stage during which full recovery is possible, especially if the elements requiring intervention are identified.

The second stage is that of clinically manifest frailty, corresponding to a state in which the available functional reserves are insufficient. During this stage, recovery is incomplete, but a well-thought-out therapeutic plan, adapted to the patient’s profile can favor the transition towards the prefrail stage, with an obvious improvement of health and quality of life.

The final stage of frailty is that of frailty-related complications and is related to severe physiological vulnerability and reduction of functional reserves. The body is no longer able to cope with aggressions, leading to an increased risk of falls, disability, polypharmacy, prolonged hospitalizations, severe infections, institutionalization and death.

The initial findings of Fried et al. (19), supporting an increase in the prevalence of frailty syndrome once every five years, were confirmed by subsequent studies, one of the most important being conducted by Gill et al. (20), as part of a longitudinal study which observed and confirmed the transition between the three stages of frailty during the 4.5 years of follow-up. This transition is directly dependent on patient’s initial frailty state, supporting once again the opportunity for screening and early diagnosis of frailty (21). Progression towards a more severe stage of frailty is more common than transition towards a lower stage, one of the causes being also the defensive medicine practice, addressing the frailty-related complications: treatment of falls, cognitive decline or immobilization. The association of sensory and cognitive deficits along with polypharmacy and the tendency towards therapeutic and diet non-compliance participate in the aggravation of chronic diseases, with repeated decompensations, frequent hospitalizations and the progression of frailty (22).

The assessment of the degree of frailty remains an intensely discussed topic, numerous studies conducted over the past 20 years suggesting various scales and tests. Using different measurement tools led to different results, hard to compare in identifying frailty, which led to the conclusion that the use of at least two tools for measuring frailty are necessary (22). Our study used the Groningen and the Fried scale; the results show that the Groningen test could not determine the pre-frail stage in the study group, along with an over-diagnosis of frailty in the group of robust older persons. By analyzing these data, we conclude that the comprehensive geriatric assessment remains the golden standard method for the diagnosis of frailty, provided that it is conducted by a team with experience in drafting the questionnaires and interacting with elderly persons. These findings are consistent with the numerous studies carried out throughout the world in recent years (23, 24). These results underline the need to adopt a tool for diagnosing the stages of frailty that is easy
to apply within primary health care or to facilitate the access of the elderly to geriatric centers with experience in the field.

Quality of life was poorer in the subgroup of frail compared with robust persons. The physical component has recorded lower scores than the mental component, which leads to the need of determining the other influencing factors, as well as the impact of frailty on each element related to quality of life. The multiple special aspects of QOL in the elderly require a more specific assessment, including the features of the individual in terms of expectations, social or family environment.

Disabilities, dependence and repeated hospitalizations experienced by elderly people due to frailty, adversely have a negative impact on quality of life. In this age segment, physical health has a more important role in the quality of life, thus the implementation of measures aimed at reversing the frailty syndrome can maintain the state of wellbeing and ensure successful aging.

CONCLUSIONS
We presented the preliminary results of a prospective study that shows that frailty has a significant influence on the quality of life of the elderly, but medical, psychological and social particularities in this age group require a specific QOL assessment tool.

The comprehensive geriatric assessment remains the most appropriate method for an accurate diagnosis of frailty, but it requires time and the expertise of a geriatrician, thus making it difficult to use as a screening method in the primary medical practice.

REFERENCES

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**USE OF PCR TECHNIQUE FOR IDENTIFICATION OF MICROSPORUM SPECIES**

The identification of species in the *Arthroderma otae* complex is necessary in order to determine the source of infection and reduce the risk of transmission. *Microsporum canis* is a zoophilic species, whereas *M. audouinii* and *M. ferrugineum* are anthropophilic. In a paper published by Kobylak et al an alternative method is proposed to allow species-specific identification of both anthropophilic and zoophilic species. For this purpose, two PCR assays (both traditional and real-time) were designed based on differences in the DNA fragment encoding β-tubulin and were applied using DNA extracted from pure culture. The two assays were able to identify *M. canis* and *M. audouinii/M. ferrugineum* with 100% sensitivity and specificity. These methods can be applied in routine laboratory praxis and are also useful for epidemiological studies (Kobylak N, Bykowska B, Kurzyk E, Nowicki R, Brillowska-Dąbrowska A.PCR and real-time PCR approaches to the identification of *Arthroderma otae* species *Microsporum canis* and *Microsporum audouinii/Microsporum ferrugineum*. *J Eur Acad Dermatol Venereol*. 2016 Jun 15. doi: 10.1111/jdv.13681. [Epub ahead of print])

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