

Prevalence of Frailty Syndrome among Diabetic and Non-Diabetic Elderly in a Tertiary Care Hospital

Ajay Abel Mall¹, Lal Babu Prasad²

¹Assistant Professor Dept. of General Medicine Venkateshwara Institute of Medical Sciences Gajraula U.P. India

²Assistant Professor Dept. of General Medicine Venkateshwara Institute of Medical Sciences Gajraula U.P. India

Received: 10-01-2022 / Revised: 15-02-2022 / Accepted: 30-03-2022

Corresponding author: Dr. Lal Babu Prasad

Conflict of interest: Nil

Abstract

Background: An increase in the percentage and overall number of people over 90 years old, as well as a sizeable number of centenarians, have coincided with an increase in life expectancy during the course of the 20th century. Care for this most vulnerable subset of patients can be improved by clinicians being aware of the Frailty syndrome, its biological foundation, and the elevated risk for negative consequences. The ability to identify and address frailty in clinical practice gives geriatric medicine a fresh perspective.

Aims & objectives: This includes researching the frequency of frailty among the elderly in the neighborhood and providing specialized care for this vulnerable group.

Material & methods: People older than 65 years old were included in this hospital-based observational study. According to Fried et al definition 's of the frailty phenotype (2001), physical frailty is a clinical syndrome in which the subject exhibits three or more of the five criteria. The sample population's elderly frailty prevalence was evaluated. Additionally, we contrasted the prevalence of frailty across groups with and without diabetes.

Results: The age range of 80 years and older was where frail subjects tended to fall. Pre-frail patients tended to congregate in the 65–69 age range. Male:female ratio for patients who were fragile was 0.46:1. Study participants who were frail as opposed to pre-frail had a higher percentage of diabetes. Though it was not statistically significant ($p = 0.197$), there was a connection between diabetes and frailty. **Conclusion:** Frailty is prevalent in people aged more than 80 years and females.

Keywords: Frail, prefrail, Elderly, gait speed, Sarcopenia.

This is an Open Access article that uses a fund-ing model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Frailty is a clinical illness that affects older persons and is related with negative health outcomes like falls, hospitalization, and mortality. It is defined by a progressive and

rising decline in the function or reserves of many physiologic systems [1]. Body weight loss, decreased physical activity, slowed gait speed and balance, osteoporosis, diminished

cognitive function, and changed nutritional status are all clinical indicators of frailty [2]. The ability to handle chronic or sudden stressors is weakened in a condition of fragility, which is conceptually described as a clinically discernible state of heightened vulnerability brought on by aging-associated reduction in reserve and function across various physiologic systems [3,4]. By matching three of the five phenotypic criteria for impaired energetics—low energy, poor grip strength, low physical activity, reduced waking speed, and/or unintended weight loss—it has been operationally defined by Fried et al. Although there is increasing interest in frailty, it remains unclear what pathophysiological alterations cause frailty [5]. One such potential pathophysiological alteration that may be closely associated with frailty is inflammation. Frailty may be caused directly or indirectly by inflammatory chemicals due to their negative effects on musculoskeletal metabolism and the endocrine system [6]. Both diabetes and frailty are age-related conditions that share some risk factors, such as glucose dysregulation, impaired insulin resistance, physical inactivity, and obesity [7]. Their underlying pathophysiology also involves disturbances in vascular, endocrine, neurohormonal, and muscular function, among other things. We intended to investigate the frequency of frailty among elderly people with and without diabetes since early detection of frailty in the elderly can improve the practice of geriatric medicine [8].

Aims & objectives: This includes researching the frequency of frailty among the elderly in the neighborhood and providing specialized care for this vulnerable group.

Materials and Methods

We conducted the observational study at the outpatient Internal Medicine department of a medical college in Central India after receiving consent from the institutional human ethics council. Over the course of two

years, the investigation was carried out. The study comprised participants who were above 65 years old and present. Patients younger than 65 years of age, those who had Parkinson's disease, strokes with residual hemiparesis, symptoms of congestive heart failure, uncompensated endocrine disorders, active infections or malignancies, rheumatoid arthritis or any other inflammatory conditions, or who were taking immunosuppressive medications, such as oral corticosteroids, were also excluded from the study. The subjects were signed up after receiving written informed permission. Basic demographic information was gathered, and respondents were split into two groups according to their diabetes status: diabetics were placed in group 1 and non-diabetics were placed in group 2. Frailty was evaluated using the Fried et al. criteria. The five criteria for evaluating frailty in Fried et al. were devised by Fried and colleagues and include weight loss, tiredness, poor physical activity, slowness, and weakness. Different age groups, sexes, and diabetic condition were evaluated for the percentage of people who were frail.

Results

The study comprised a total of 90 participants who met the inclusion requirements. The study population's age, gender distribution, and diabetes status are shown in Table 1. 53 percent of the study participants were female, 51 percent were non-diabetics, and 71 percent of the participants were in the 65 to 75 year age range. 90 individuals were included, and 44 (49%) were frail and 46 (51%) were prefrail. 36 percent of the frail adults were over the age of 80, 62 percent were female, and 55 percent had diabetes. In comparison to men, women were substantially more frail ($p = 0.05$). The Fried index for the study population is displayed in Table 2. The percentage of research participants who lost weight and had severe tiredness was substantially greater in the fragile [26 (86.7%) and 22 (78.5%) respectively ($p=0.001$)].

Frail 42 (56.7%) had a noticeably worse hand grip ($p = 0.023^*$). Among the frail group, walking speed and physical activity were both significantly low [28 (70%) ($p = 0.011^*$) and 40 (76.9%) respectively ($p = 0.001^*$)]. The

percentage of frail patients among diabetes and non-diabetic patients is shown in Table 3. Diabetes and frailty did not significantly correlate.

Table 1: Age, sex distribution and diabetes status

Age group (years)	Percentage
65 – 69	38%
70 – 74	33%
75 – 79	9%
80 and above	20%
Sex	
Male	46%
Female	53%
Diabetes status	
Diabetic	48%
Non-diabetic	51%

Table 2: Fried index

Parameters	Frail	Pre frail	total	P value
Weight loss present	26(86.7)	4(13.33)	30 (100)	0.001*
Weight loss absent	18(30)	42(70)	60 (100)	
Exhaustion scale 0	8 (20)	32 (80)	40 (100)	0.001*
Exhaustion scale 1	2 (25)	6 (75)	8 (100)	
Exhaustion scale 2	12 (85.7)	2 (14.28)	14 (100)	
Exhaustion scale 3	22 (78.5)	6 (21.4)	28 (100)	
Hand grip normal	2 (12.5)	14 (87.5)	16 (100)	0.023*
Hand grip Weak	42 (56.7)	32 (43.2)	74 (100)	
Walking speed fast	16 (32)	34 (68)	50 (100)	0.011*
Walking speed Slow	28 (70)	12 (30)	40 (100)	
Physical activity Low	40 (76.9)	12(23.07)	52 (100)	<0.001*
Physical activity Satisfactory	4 (10.5)	34 (89.5)	38 (100)	

Table 3: Frailty among diabetics and non-diabetics

	frail	Pre frail	total	P value
Diabetic	24(54.55%)	20 (45.45%)	44 (100%)	0.657
Non-diabetic	20 (43.48%)	26 (56.52%)	46 (100%)	

Discussion

Frailty is acknowledged as a geriatric syndrome that increases vulnerability to a variety of clinically significant outcomes, including functional decline, institutionalization, and falls. It is different

from disability and comorbidity, is highly frequent, and may be treatable. To allocate appropriate assistance to older people living in the community, a precise assessment of care needs is necessary. The goal of screening for frailty in aged persons may be to find those who are feeble at an early stage, have

few or no complaints linked to their frailty, and are still responsive to therapies. If the risk of frailty can be reduced or unfavorable health consequences can be prevented, screening will only be beneficial [9]. Preventing needless pain brought on by ineffective medical interventions is equally vital. Since frailty is common in those over 65, our study included participants in this age range. According to statistical significance, a total of 90 patients were enrolled, and Fried criterion was used to classify them as frail and pre-frail. 44 of them were judged to be frail and 46 to be pre-frail [10]. The age range of 80 years and older was where frail subjects tended to fall. Pre-frail individuals were concentrated in the 65–69 age range, numbering 24 (52.17%). The age distribution of the frail group was over 816 years, while that of the pre-frail group was 754 years, according to O. Theou et al. 2010; this demographic trend was similar in our study. Libre Frailty was more prevalent in the age range under 80 (32.9%) and the female population had more frail people (25.8%), which was similar to our study. J D J, López A M, Valhuerdi A, et al. reported from Havana and Matanzas provinces between June 2003 and July 2011. Using Fried criteria, J. Collerton et al. (2012) found that women were more likely to be frail than men (12.7 percent versus 27.7 percent, respectively). In our study, the ratio of participants with frailty was 1:0.4, and it was substantially greater in females than in males ($p = 0.05$). These studies show that frailty is a prevalent occurrence in women and that careful screening is necessary to avoid its unfavorable effects.

All five Fried criterion components—weight loss ($n=26$; $p=0.001$), fatigue scale ($n=22$; $p=0.001$), hand grip ($n=42$; $p=0.023$), poor walking speed ($n=28$; $p=0.010$), and low physical activity ($n=40$; $p=0.001$)—showed statistically significant associations with frailty on their own. According to additional research, three of the initial Fried frailty

criteria—slow walking speed, limited physical activity, and weight loss—were independently linked to persistent disability, prolonged nursing home stays, and mortality. In our study, it was found that weight loss was 86.7 percent as compared to 23 percent, exhaustion scale was 78.5 percent as compared to 13 percent, weak hand grip was 56.7 percent as compared to 54 percent, walking speed was 70 percent as compared to 43 percent, and physical activity level was 76.9 percent as compared to 31 percent. According to a review of the literature, the frailty syndrome is characterized by poor hand grasp and slow walking speed. Patients with sluggish gait speed were also more likely to be female (43% vs. 25%, $p=0.03$) and to be shorter (1.65 m vs. 1.69 m, $p=0.01$). The sole factor that was independently related with harmful falls was slow gait speed, which showed the strongest and most consistent relationships with the undesirable outcomes [11]. Gait speed has been proven to predict incidence disability, and death almost as well as summary measures of lower extremity performance, making it one of the most reliable and affordable markers of frailty in clinical and research settings. Hirsch et al CHS 's investigation found that the odds ratio (95 percent confidence interval) for diabetes was 1.61 (1.14–2.26), but the odds ratio for diabetes-related pre-frailty was 1.25 (1.04–1.50). Similar findings were seen in our study, although they were not statistically significant possibly due to the lower size of the study group. The proportion of frail participants was higher in diabetics than in non-diabetics. [12]

Summary and Conclusions

Following a 1990 American Medical Association report that highlighted the expanding population of vulnerable older persons, frailty has become a significant clinical issue. Frail people are known to be more susceptible to deterioration and unfavorable health-related traits. Frailty is becoming more and more recognized as a geriatric syndrome that may be treatable. A

window of opportunity for vital preventive measures would be created by the confirmation and identification of the existence of a "pre-frail" condition. The study's frailty scores were sensitive and precise enough to identify the patients who were fragile. According to this study, the senior population has a higher percentage of fragile patients.

The senior female population had a higher percentage of fragile people. All five factors were shown to be statistically significant in our study for detecting frailty. The study showed that the Fried criteria's individual components were valid for classifying older people as frail or pre-frail. In the practice of geriatric medicine, a multi-domain assessment along with multimodal therapies, such as encouraging physical activity, cognitive therapy, and nutritional supplementation for the frail, would give a cost-effective strategy.

References

1. Xue Q. L. The frailty syndrome: definition and natural history. *Clinics in geriatric medicine*, 2011;27(1), 1–15.
2. Greco, E. A., Pietschmann, P., and Migliaccio, S. Osteoporosis and Sarcopenia Increase Frailty Syndrome in the Elderly. *Frontiers in endocrinology*, 2019;10, 255.
3. Assar, M. E., Laosa, O., and Rodríguez Mañas, L. Diabetes and frailty. *Current opinion in clinical nutrition and metabolic care*, 2019;22(1), 52–57.
4. William Russell Hazzard. Frailty. Keystone in the Bridge between Geriatrics and Cardiology. In Gary Gerstenblith. *Cardiovascular Disease in the Elderly*. 2005:Pg – 51.
5. Ouslander JG, Tinetti ME. Principles of Geriatric Medicine and Gerontology. 5th ed. McGraw-Hill. 2003: 1487–1502
6. Vellas, B., Cestac, P., and Moley, J. E. Implementing frailty into clinical practice: we cannot wait. *The journal of nutrition, health and aging*, 2012;16(7), 599–600.
7. Tracy R. P. Inflammation, the metabolic syndrome and cardiovascular risk. *International journal of clinical practice. Supplement*, 2003;(134), 10–17.
8. Reuben, D. B., Cheh, A. I., Harris, T. B., Ferrucci, L., Rowe, J. W., Tracy, R. P., and Seeman, T. E. Peripheral blood markers of inflammation predict mortality and functional decline in high-functioning community-dwelling older persons. *Journal of the American Geriatrics Society*, 2002;50(4), 638–644.
9. Mathias, S., Nayak, U. S., and Isaacs, B. Balance in elderly patients: the "get-up and go" test. *Archives of physical medicine and rehabilitation*, 1986;67(6), 387–389.
10. Pijpers, E., Ferreira, I., Stehouwer, C. D., and Nieuwenhuijzen Kruseman, A. C. The frailty dilemma. Review of the predictive accuracy of major frailty scores. *European journal of internal medicine*, 2012;23(2), 118–123.
11. Compté, N., Boudjeltia, K. Z., Vanhaeverbeek, M., De Breucker, S., Pepersack, T., Tassignon, J., Trelcat, A., and Goriely, S. Increased basal and alum-induced interleukin-6 levels in geriatric patients are associated with cardiovascular morbidity. *PloS one*, 2013;8(11), e81911.
12. Berthelot, M., Rieker, A., & Correia, J. C. The difficulties experienced by patients with low back pain in France: a mixed methods study. *Journal of Medical Research and Health Sciences*, 2022;5(6), 2039–2048.