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Original Research Article

Determinants of geriatric giants among the geriatric population of north India: a community-based cross-sectional study in Kanpur Nagar

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ABSTRACT

Background: The "geriatric giants," or the "5 I's," in geriatrics, refer to common problems in older adults: Immobility, Instability, Incontinence, Intellectual Impairment and Iatrogenesis (other disorders). The present study was done with objective to estimate the prevalence and determinants of geriatric giants among the geriatric population residing in Kanpur Nagar district.
Methods: Geriatric people (>60 years) residing for more than 1 year in Kanpur Nagar's urban and rural areas participated in a community-based cross-sectional study. In each area, 256 participants were directly interviewed by using a pre-structured questionnaire for sociodemographic variables and history of morbidities. Microsoft Excel was used to enter and compile the collected data. Data was analysed using the SPSS, trial version 29.0.2.0(20).
Results: In this study, intellectual problems were the most prevalent geriatric giant (30%), followed by chronic complications/iatrogenic problems (24%), immobility (21%), incontinence (13%) and instability (12%). Nearly four-fifths of the geriatric had at least one geriatric giant, while 43.2% had more than two, highlighting a substantial burden of cumulative geriatric morbidity. Multivariable logistic regression analysis shows that Geriatric addicted to chewing tobacco, smocking, alcohol shows significant association and higher risk with geriatric giant syndrome.
Conclusions: The study highlights the need to integrate routine geriatric screening into primary healthcare under the National Programme for Health Care of the Elderly. A multidisciplinary team involving geriatricians, physiotherapists, occupational therapists and pharmacists can work together to assess fall risk factors, implement preventive measures and promote safe mobility.

Keywords: Determinants, Geriatric giants, Geriatric giant syndrome, Incontinence, Intellectual, Immobility

INTRODUCTION

Sir Sterling Ross stated, “You do not heal old age; you protect it, you promote it, you extend it”. Bernard Isaacs first used the phrase "geriatric giants" in 1965. An array of illnesses that are more frequent among the geriatric comprises geriatric giants. The "geriatric giants," or the "5 I's," in geriatrics, refer to common problems in older adults: Immobility, Instability, Incontinence, Intellectual Impairment and Iatrogenesis (other disorders).[1] Urinary incontinence is defined as the unintended leakage of urine. Urinary Incontinence is common among the geriatric, which leads to social withdrawal, skin health issues and heightened care requirements. Immobility or decreased ability to move independently can occur from acute illness, chronic disease or general physical deconditioning. Immobility contributes to prolonged hours of sitting or lying, which further increases risk for complications like pressure sores and muscle wasting. Medical conditions such as arthritis, stroke or frailty-related muscle weakness are the major causes of immobility. Imbalance or instability occurs due to muscle weakness, poor coordination or neurological conditions resulting from single or multiple diseases. Instability increases the risk of falls and injuries among the geriatric.

Instability is a major cause of injury and hospitalization in older adults. Intellectual Impairment includes cognitive declining conditions like dementia and Alzheimer's disease, which can profoundly affect daily functioning activities, memory, judgment and decision-making. Iatrogenesis of geriatric giants are the complications due to chronic diseases like diabetes, thyroid and cancer and complications from surgery.[1-8] For both the patients and their caregivers, the geriatric giants have detrimental effects.[9] Early evaluation of giant's determinants may result in the prompt identification of these significant disorders and the application of techniques to prolong older people's independence.[10] Objectives of current study were to estimate the prevalence of geriatric giants among the geriatric population residing in Kanpur Nagar district and to determine the determinants of geriatric giants among the geriatric population of Kanpur Nagar district.

Operational definitions

Instability

Geriatric complaining frequent falls (in year), muscle weakness, poor coordination or diagnosed neurological conditions

Immobility

Geriatric diagnosed with Parkinson's disease, arthritis, osteoporosis, stroke or frailty-related muscle weakness and hip fracture

Urinary incontinence

More than two episodes in a month.

Intellectual impairment

Geriatric diagnosed with dementia and Alzheimer's disease

Iatrogenic

Geriatric diagnosed with diabetes, thyroid and cancer and complications from surgery.

METHODS

A community-based cross-sectional study was conducted among geriatric (>60 years) of Kanpur Nagar. Between June 2024 and February 2025, a multistage systematic random sampling was used to identify study participants. For the study, two blocks and two wards were randomly selected from rural and urban areas, respectively. From each block, 4 villages and each ward, 4 Mohallas were randomly selected from the ward and block list of urban and rural areas.[11] Geriatric who had lived in Kanpur Nagar's urban and rural areas for more than a year were included in the study. The study excluded geriatric people with mental illnesses, those who were incapable of perceiving or responding and those who declined consent. Sample size was calculated using N=Z2PQ/d2 statistical formula; Where, P=5.5% (morbidity with least prevalence) and d=3%.[12] Total 512 geriatric individuals were selected (256 from urban and 256 from rural areas of Kanpur Nagar) participants were directly interviewed using a pre-structured questionnaire for socio-demographic variables and history of morbidities in a household survey. Microsoft Excel was used to enter and compile the collected data. The data collected was entered using MS Excel. The master table was made accordingly after compiling all collected data. Data were analysed using SPSS, trial version 29.0.2.0 (20). Descriptive statistics such as frequency along with their percentage for categorical variables; mean and standard deviation for continuous variables were determined. For categorical dependent and independent variables, the chi-square test was used to demonstrate an association of determinants with geriatric giants.

An independent t-test was used to demonstrate an association between continuous dependent and independent variables. A 'p' value less than 0.05 was considered statistically significant. Ethical clearance was obtained from the Institutional Ethics Committee (For Biomedical Health & Research) of GSVM Medical College, Kanpur, UP, before commencing the study. Participants were ensured about their privacy and the confidentiality of their collected personal and medical data.

RESULTS

Figure 1 shows the distribution of geriatric giants among the geriatric population: intellectual problems were the highest (30%), followed by chronic complications (iatrogenic) (24%), immobility (21%), incontinence (13%) and instability (12%). Among the geriatric, 33.4% had no geriatric giant, 39.1% had only 1 giant problem and 27.5% had more than 1 geriatric giant problems (Table 1). Chi-square test of significance was employed to determine the determinants of geriatric giants (Table 2).

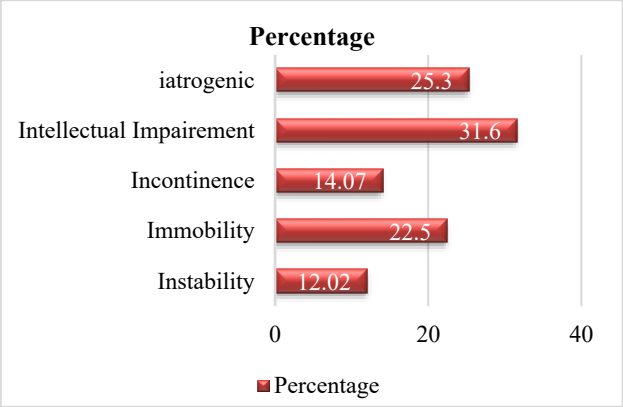


Figure 1: Distribution of geriatric giants among geriatric population.

The majority of the sociodemographic determinants of geriatric giants, i.e., age, gender, religion, marital status, educational qualification, occupation, type of family, socio-class, were not associated with the presence of any geriatric giants. The presence of any geriatric giants among urban geriatric (57.5%) was higher than among rural geriatric. Geriatrics who were addicted to any substance had higher odds of the presence of geriatric giants. The association between addiction to chewing tobacco, smoking, alcohol and betel leaf (with tobacco) and the presence of geriatric giants was associated with a higher risk. This association was significant between addiction to chewing tobacco, smoking, alcohol and betel leaf (with tobacco) and geriatric giant presence.

Table 1: Distribution of geriatric giants among geriatric.

Geriatric giant	No. (%)
No geriatric giant	171 (33.40)
1 geriatric giant	200 (39.1)
>1 geriatric giants	141 (27.5)

Table 2: Association of determinants with Geriatric giant.

Determinants		Geriatric Giant present No. (%)	Geriatric Giant absent No. (%)	Crude OR 95% CL (UL-LL)	P value
Age (in years)	60-80	316 (92.7)	161 (94.2)	0.79 (0.37 -1.67)	0.530
	>80	25 (7.3)	10 (5.8)		
Gender	Male	153 (44.9)	72 (42.1)	1.12 (0.77 -1.62)	0.552
	Female	188 (55.1)	99 (57.9)		
Religion	Hindu	304 (89.1)	161 (94.2)	0.51 (0.25 -1.05)	0.064
	Others	37 (10.9)	10 (5.8)		
Marital status	Married	274 (80.4)	140 (81.9)	0.91 (0.56 -1.45)	0.680
	Unmarried/ Divorced/ Separated/ Widow/ Widower	67 (19.6)	31 (18.1)		
Educational Qualification	Illiterate	76 (22.3)	43 (25.1)	0.85 (0.56 -1.31)	0.470
	Literate	265 (77.7)	128 (74.9)		
Occupation	Unemployed	116 (34.0)	64 (37.4)	0.86 (0.59 -1.26)	0.446
	Employed	225 (66.0)	107 (62.6)		
Area of residence	Urban	196 (57.5)	59 (34.7)	2.54 (1.74 -3.73)	<0.001
	Rural	145 (42.5)	111 (65.3)		
Type of family	Nuclear	160 (46.9)	68 (39.8)	1.34 (0.92 -1.94)	0.124
	Joint/ Extended	181 (53.1)	103 (60.2)		
Socio-class	Lower	20 (5.9)	13 (7.6)		
	Upper	96 (28.2)	30 (17.5)	0.48 (0.21 -1.08)	0.076
	Middle	225 (66)	128 (74.9)	0.87 (0.42 -1.87)	0.072
Type of addiction	Chewing tobacco-Yes	183 (53.7)	70 (40.9)	1.67 (1.15 -2.42)	0.007
	Chewing tobacco-No	158 (46.3)	101 (9.1)		
	Smoking-Yes	75 (22.0)	19 (11.1)	2.26 (1.31 -3.88)	0.003
	Smoking-No	266 (78)	152 (88.9)		
	Alcohol-yes	74 (21.7)	25 (14.6)	1.62 (0.99-2.66)	0.046
	Alcohol- No	267 (78.3)	146 (85.4)		
	Betel leaf with tobacco (YES)	79 (23.2)	22 (12.9)	2.04 (1.22 -3.41)	0.006
	Betel leaf with tobacco (NO)	262 (76.8)	149 (87.1)		

DISCUSSION

In this study, intellectual problems were the most prevalent geriatric giant (30%), followed by chronic complications/iatrogenic problems (24%), immobility (21%), incontinence (13%) and instability (12%). Nearly four-fifths of the geriatric had at least one geriatric giant, while 43.2% had more than two, highlighting a substantial burden of cumulative geriatric morbidity. Similar literature emphasizes that geriatric syndromes frequently coexist and interact, accelerating disability and increasing healthcare utilization.[13] The predominance of intellectual problems is consistent with studies demonstrating cognitive impairment as a major contributor to geriatric vulnerability and poor self-rated health.

Study in Netherlands reported that geriatric giants strongly correlate with functional outcomes and life satisfaction rather than demographic variables alone.[14] The relatively lower prevalence of incontinence and instability in the present study may reflect underreporting due to social stigma or cultural hesitancy. Socio-demographic factors such as age, gender, marital status, education, occupation, family type and socio-economic class were not significantly associated with the presence of geriatric giants. This suggests that geriatric syndromes may affect geriatric individuals across demographic strata and are driven more by functional decline, lifestyle and healthcare-related factors. Similar observations have been reported by study in Netherlands where demographic characteristics showed limited predictive value once health and functional variables were considered.

However, Malaysia study have reported higher prevalence among institutionalized geriatric, highlighting the influence of living environment and dependency rather than age alone.[8] Findings from Iran similarly reported widespread presence of geriatric giant. Only 70.99% remained independent in basic ADLs, while urinary incontinence affected 27.40% and frailty was present in 12.07% with an additional 46.76% pre-frail segment.[2] Similarly, the Mangalore study reported very high frequencies of urinary incontinence (75.7%), depression (69.3%), falls/instability (67.3%), dementia (47.5%) and polypharmacy (33.6%), with syndromes increasing sharply with age.[7] The present study identified urban residence as an independent predictor of geriatric giants with significantly higher risk.

Urban environments are known to foster sedentary lifestyles, dietary transitions, psychosocial stress and higher NCD burden all contributing to immobility, cognitive decline and polypharmacy. Higher medical utilization may additionally increase iatrogenic complications. Comparable evidence from the Study done at Iran linked frailty with low physical activity and higher BMI both more common in urban or transition settings.[2] Findings of study at Wales, UK found that environmental and lifestyle determinants play a major role in the development of geriatric syndromes.[13] Increased medical utilization in urban settings may further increase the risk of iatrogenic complications and functional decline stated by South African Study.[15] The present study indicated higher risk of geriatric giants among non-vegetarians, suggesting a possible nutrition–frailty–cognition axis. Morley's updated conceptualization of modern "giants" now includes frailty and sarcopenia; both strongly linked to diet and physical activity. Study at Iran supports this framework through significant associations between frailty and malnutrition, depression and physical inactivity, underscoring the multidimensional nature of geriatric decline.[2]

Substance use emerged as a strong independent determinant. Geriatric addicted to chewing tobacco, smoking and alcohol had significantly higher risk of geriatric giants even after adjustment. Tobacco and alcohol accelerate vascular ageing, impair cognition, increase fall risk and interact with medications, contributing to instability, immobility and iatrogenic complications. South African study emphasized that polypharmacy and adverse drug events significantly contribute to geriatric syndromes and substance use further amplifies these risks.[15] Behavioural modification and addiction cessation programs targeted at geriatric populations can therefore substantially reduce functional decline.

Multivariable analysis of study at Rajasthan confirmed that urban residence and substance addiction remained independent predictors of geriatric giants, underscoring the importance of modifiable environmental and behavioural determinants. Indian literature recognizes geriatric syndromes as a growing therapeutic challenge requiring integrated and comprehensive care models rather than disease-centred approaches.[16-18]

CONCLUSION

The study highlights the need to integrate routine geriatric screening into primary healthcare under the National Programme for Health Care for Elderly. Early identification of cognitive decline, mobility limitation, continence issues and medication-related problems can enable timely interventions, reduce disability and improve quality of life. As a cross-sectional study, causal relationships cannot be established. Self-reported data may be subject to recall bias and underreporting.

Nevertheless, the study provides valuable community-based evidence on geriatric giants in North India and identifies actionable determinants for public health intervention. A multidisciplinary team involving geriatricians, physiotherapists, occupational therapists and pharmacists can work together to assess fall risk factors, implement preventive measures and promote safe mobility. Increased tendency to lose balance and fall, often due to muscle weakness, poor coordination or neurological impairment. Instability is a major cause of

injury and hospitalization in older adults. A comprehensive approach involving geriatricians, neurologists, psychologists and occupational therapists is crucial for accurate diagnosis, management and support for both the individual and their caregivers.

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