Journal of Cardiovascular Disease Research
ISSN: 0975-3583,0976-2833 VOL15, ISSUE 07, 2024

ORIGINAL RESEARCH

A Study on The Clinical Profile of Geriatric Medical Emergencies in a Tertiary Care Hospital

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Received: 28 May 2024 Accepted: 15 June 2024

Abstract
Aim: To study the clinical profile of geriatric emergencies presenting to the emergency department.
Material And Methods: This study was conducted in the Emergency Department of Rajmata Vijaya Raje Scindia Government Medical College, Bhilwara, Rajasthan among patients aged >65 years who presented to the Emergency Department of the Hospital, both males and females, and had given written informed consent, were included in the study. Details of history and physical examination findings of all the patients were recorded on a standard data collection sheet. Diagnosis was made based on the clinical history, vitals, systemic examination, and the initial and/ or relevant investigations. Data was collected and subjected to statistical analysis using SPSS software version 24.
Results: The maximum participants belonged to the age group of 65-70 years (53.5%).Most common symptom was shortness of breath (37%), followed by fever (23.5%). Most common cause was respiratory (33.5%) followed by metabolic (14%), cardiovascular (13.5%) and neurological (12.5%) and infectious (12.5%), followed by gastrointestinal (7%), and then trauma (6%). Among 200 patients, 58% patients required Hospital Admission (ICU or Ward), 27% went back home from the ED itself on oral medicines, and 15 % patients suffered death.
Conclusion: Respiratory Emergencies were the most common, followed by Metabolic, Cardiovascular, Neurological and Infectious, Gastrointestinal, Trauma and minor causes included Renal, Genitourinary, Anaphylactic and Neoplasm. ED of India should be aware of this demographic profile, and should be sensitised to it. ED should consider taking on the role of a tertiary injury prevention centre, and provide opportunistic screening for the at-risk elderly.
Key words: Geriatric Emergencies, Emergency Department, Clinical Profile.

Introduction:
In both developed and developing countries, the proportion of people over 60 years of age is growing faster than any other age group as a result of longer life expectancy due to improved health care. Geriatric health and diseases are influenced by the process of aging.[1,2] Age is a recognized constitutional risk factor for many medical conditions, especially non communicable diseases. This might be due to biophysiological changes characterized by progressive constriction of the homeostatic reserves of each organ system and a decline in the ability to adapt to physical, physiological, and psychosocial challenges.[3] Older patients are likely to have multiple comorbidities or chronic illnesses with impaired physical and cognitive function and are likely to have lesser social support.[4] Geriatric patients are therefore at a higher risk of morbidity and mortality when they present with emergencies. This poses a management challenge to the emergency department (ED) physicians. [5]
As the number of people over the age of 65 years is increasing in both the developed and developing countries, the number of ED visits is also bound to increase. In the West, geriatric age group represents more than 13% of the population and nearly 15% of the ED visits are made by the elderly, and these patients were more likely to have serious injury or illness, consume more ED resources, and require surgery or admission.[6] As per the 1991 census of India, the geriatric population was 57 million. There has been a steep increase in the number of elderly persons between 1991 and 2001, and according to projections, the number is likely to soar to 327 million by 2050. According to the 2011 census, the geriatric population comprised 8.2% of the total population.

Availability of better health care facilities and decreasing mortality rate probably contributed to this demographic change, thus acquiring India the label of "an ageing nation."[7,8]
Studies have also shown that communicable[9] and noncommunicable diseases[10] have continued to plague adult population. Surprisingly, most of these diseases can be either prevented or treated with minimum input of health resources. In fact, most of the developed nations of the world have overcome many of these problems by such measures as practice of preventive and promotional medicine alongside the improvement in the standard of living resulting in increase in their life expectancy and aliveness.
Also Western literature[11,12] has consistently found that elderly patients when compared to younger patients were 'more ill', more likely to have atypical presentations and have higher utilisation of health care resources even in the emergency departments, this study sought to determine if an 'Asian ED' had similar problems. If we identify the problems posed on the ED by our elderly patients, our healthcare system can be better prepared to meet the 'silver tsunami'.
ED across India need to be prepared to handle this change in the demography, and hence, it is important to know the patient profile of geriatric emergencies. However, literature from India on this subject is scant.

Material And Methods:
The present cross-sectional study was conducted among patients aged >65 years who presented to the Emergency Department of Rajmata Vijaya Raje Scindia Government Medical College, Bhilwara, Rajasthan during July 2022 to June 2024. Confidentiality of the patient information was maintained. The study included only relevant investigations for the patient, no additional pricking was be done.

Inclusion Criteria
1) All patients aged >65 years who presented to the Emergency Department of the Hospital, and had given written informed consent (by themselves or the guardian).
2) Both Males and Females

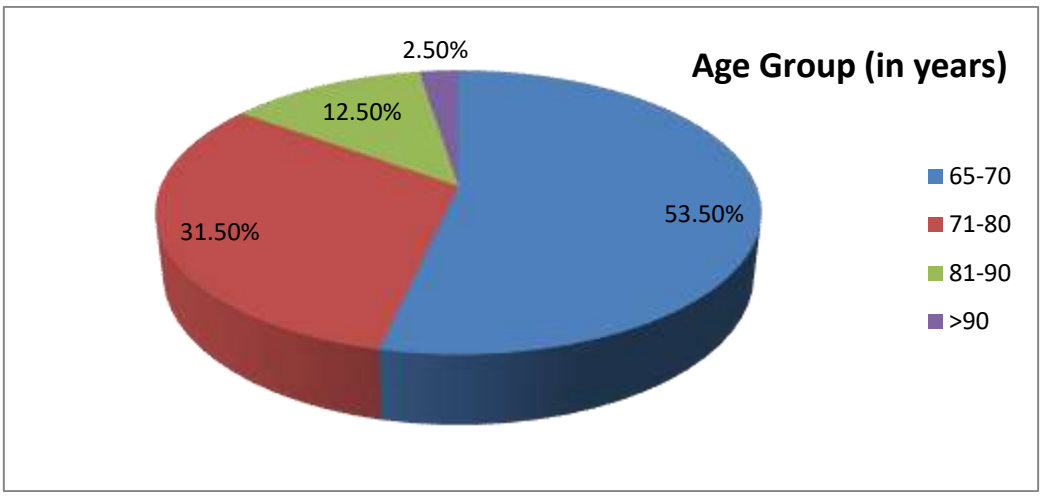
Exclusion Criteria:
1) All the patients not fulfilling the criteria for geriatric emergencies.
2) Patients who refused to give consent for participation in the study.
3) Patients who Left against Medical Advice and whose final outcome could not be determined were excluded before the final statistical analysis.

Methodology:
Data of all elderly patients presenting to the Emergency Department, satisfying the inclusion criteria, during the study period was collected. Details of history and physical examination findings of all the patients were recorded on a standard data collection sheet. After this, a Diagnosis was made based on the clinical history, vitals, systemic examination, and the initial and/ or relevant investigations. The Final Clinical Outcome of the patient was recorded as either of the 3 parameters:
1. The Patient went back home without Hospitalization on oral medicines.
2. The Patient required Hospital Admission (ICU or Wards), and was discharged.
3. The Patient suffered Death

Operational Definitions
Comorbidity: is defined as the co-occurrence of more than one disorder in the same individual. It can be diabetes, hypertension, depression etc.
Personal History: A collection of information about a person's health that allows the person to manage and track his or her own health information. A personal medical history may include information about allergies, illnesses, surgeries, immunizations, and results of physical exams, tests, and screenings.
Data was collected and subjected to statistical analysis.

Statistical analysis: Data so collected was tabulated in an excel sheet, under the guidance of statistician. The means and standard deviations of the measurements per group were used for statistical analysis (SPSS 25.00 for windows; SPSS inc, Chicago, USA).

Results:
Male and female comprised of 50.5% and 49.5% of the participants respectively.Maximum participants were from the age group of 65-70 years (53.5%) followed by 71-80 years (31.5%), followed by 81-90 years (12.5%) as shown in graph 1.



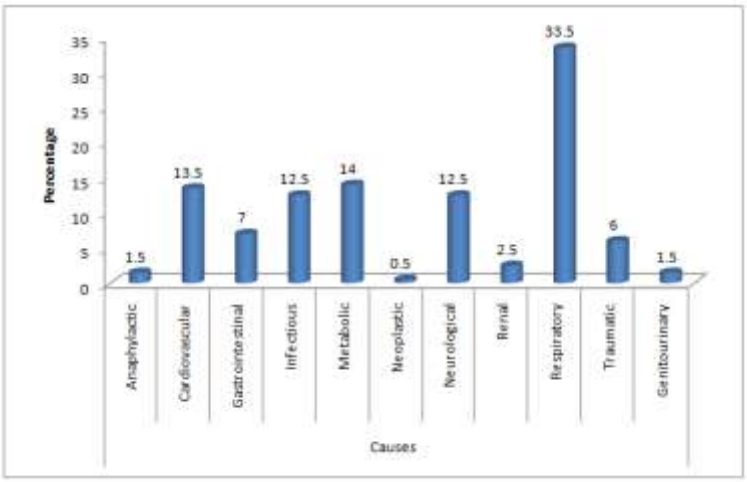
Graph 1: Age distribution among the study participants

Table 1 shows the symptoms among the study participants. Most common symptom was shortness of breath (37%) followed by fever (23.5%), giddiness (18%), nausea/vomiting (17.5%), cognitive or functional decline (14%), generalised malaise (13.5%), others (12.5%), history of fall/ trauma (10.5%). The least common symptom was abdominal pain (7.5%). Other neurological symptoms constituted 8% and chest pain was the main presentation in 9.5% study participants.

Table 1: Symptoms among the study participants

Symptoms	N	%
Single Symptom	86	43
Multiple Symptom	114	57
Shortness of Breath	74	37
Fever	47	23.5
Giddiness	36	18
Nausea/Vomiting	35	17.5
Cognitive or Functional Decline	28	14
Generalised Malaise	27	13.5
Others	25	12.5
History of Fall/ Trauma	21	10.5
Chest Pain	19	9.5
Other Neurological Symptoms	16	8
Abdominal Pain	15	7.5

Graph 2 shows the cause distribution among the study participants. Most common cause was respiratory (33.5%) followed by metabolic (14%), cardiovascular (13.5%) and neurological (12.5%) and infectious (12.5%), followed by gastrointestinal (7%), and then trauma (6%). least common cause was neoplasm (0.5%) followed by genitourinary (1.5%) and anaphylaxis (1.5%), and renal (2.5%).



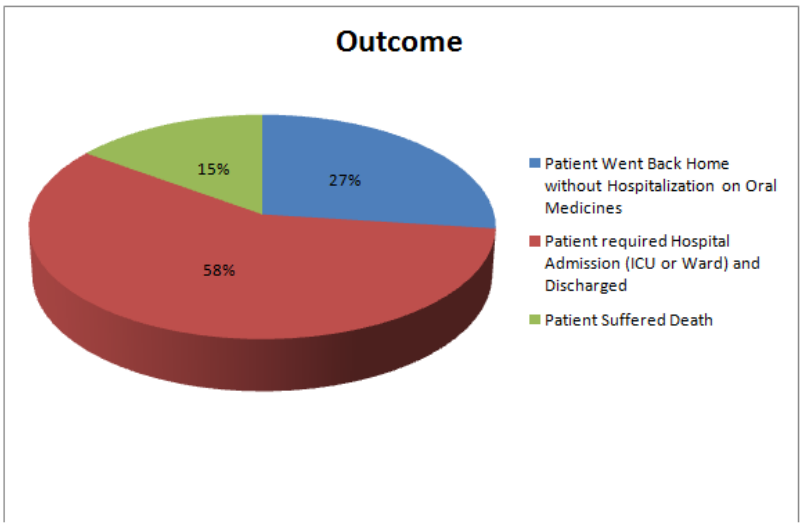
Graph 2: Causes among the study participants

Table 2 shows the comorbidities among the study participants. The most common comorbidity found in the current study was hypertension (51%), followed by type II diabetes mellitus (38.5%). Hypothyroidism was found in 9.5% of participants. Amongst the respiratory comorbid conditions, chronic obstructive pulmonary disease and bronchial asthma was reported among 5% and 7.5% of the participants respectively. Amongst the cardiovascular conditions, coronary artery disease was found amongst 18% of participants, whereas rheumatic heart disease and dilated cardiomyopathy were present in 2.5% each respectively. Chronic kidney disease was found in 7% of the participants, while 2.5% Participants had history of old CVA.

Table 2: Comorbidities among the study participants

Comorbidities	**N**	**%**
Respiratory		
Chronic Obstructive Pulmonary Disease	10	5
Bronchial Asthma	15	7.5
Endocrinological		
Type II Diabetes Mellitus	77	38.5
Hypothyroidism	19	9.5
Hypertension	102	51
Cardiovascular		
Coronary Artery Disease	37	18
Rheumatic Heart Disease	5	2.5
Dilated Cardiomyopathy	5	2.5
Chronic Kidney Disease	14	7
Cerebrovascular Disease(Old CVA)	5	2.5
Chronic Liver Disease	3	1.5
Malignancy	5	2.5
Psychiatric Disorder	6	3

58% patients required hospital admission (ICU or Ward), 27% went back home from the ED itself on oral medicines, and 15 % patients suffered death (graph 3).



Graph 3: Final clinical outcome among the study participants

Table 4 shows the correlation of cause with diagnosis. Amongst the Respiratory Causes (N=67), most common cases were COVID 19 disease (n = 44, 65.67%) followed by Acute Exacerbation of Bronchial Asthma (n=7, 10.44%) as well as Acute Exacerbation of COPD (n=7, 10.44%). Others included Pleural Effusion (n=3, 4.47%), Aspiration Pneumonia (n=2, 2.98%), Pulmonary Embolism (n=2, 2.98%), Pneumothorax (n=1, 1.49%) and Community Acquired Pneumonia (n=1, 1.49%). Among the Cardiovascular Causes (N=27), Acute MI was the most common diagnosis (n=10, 37.03%), followed by ACS (n=7, 25.92%), Acute CHF (n=7, 25.92%). Others included Acute Cardiogenic Pulmonary Edema (n=3, 7.4%) and AF with FVR (n=2, 6.89%). Amongst the Neurological events (N=25), the most common cause was Acute Stroke (n=14, 56%)) followed by Intracranial Haemorrhage (n=6, 24%). Others included Status Epilepticus (n=2, 8%), Uremic Encephalopathy

(n=2, 8%) and Hepatic Encephalopathy (n=1, 4%). The most common Metabolic Cause (N=28) for Geriatric Ailment was Hypoglycemia (n=1, 46.42%) followed by Hyponatremia(n=11, 39.28%) and Hypertensive Crisis (n = 4, 14.28%). Among the Gastrointestinal Causes (N=14), the most common ailment was Acute GE (n=7, 50%) followed by GI bleed (n=3, 21.42%). Others included Alcoholic Hepatitis with Portal Hypertension (n=2, 14.28%), Hepatic Encephalopathy (n=1, 7.14%) and SBP (n=1, 7.14%).

Discussion:

In a review done in 2007, Boumendil and colleagues showed thatICU outcomes depend more on the functional status ofpatients than age for patients older than 80 years, althoughall-cause mortality was higher in this age group. Various studies from the West have shown a rate ofadmission of 20-30% of > 70-year-olds in the ICU as wellas a mortality of up to 20-55%.[13] Recently a large studydone by Moitra, et al. showed that in the length ofICU stay was associated with worse outcomes for elderlypatients although no specific cut off was given.Given the urgency in studying age related practice patterns in Asian countries it becomes imperative to assesswhat the profile and outcomes of the elderly are inour ICUs[14].

The maximum subjects were from the age group of 65-70 years (53.5%) followed by 71-80 years (31.5%), followed by 81-90 years (12.5%). Only 2.5% of the subjects were having age>90 years. The mean age of the study subjects was 72.80±7.04 years in our study.Chik Loon Foo et al[15] in their study showed that mean age was 77±7.9 years. Abhilash et al[16] in their study revealed that the mean age of the patients was 74.2 ± 20.32 years which is approximately similar to our study. Shahla Siddiqui et al[17] in their study reported that the age range was 70-93 years. The median age was 77.5 years (SD ± 5.5 years).GUP Iloh et al[18] in their study showed that the ages of the patients ranged from 65 years to 98 years with mean age of 72 ± 1.14 years.

In this study, male and female comprised of 50.5% and 49.5% of the subjects respectively. Hence there was approximately equal distribution of male and female. In a study by Abhilash et al[16], there was a male predominance (65.4%).Shahla Siddiqui et al[17]in their study found that there were 58%males and 42% females in the cohort.GUP Iloh et al[18] in their study revealed that there were 94 males and 122 females with a male to female ratio of 1: 1.3.

This difference in male female distribution among different studies might be due to the variance in study area.

Most common symptom was shortness of breath (37%), followed by fever (23.5%), giddiness (18%), nausea/vomiting (17.5%) and Cognitive or Functional Decline (14%). Generalised malaise was present in 13.5% subjects, and other symptoms constituted 12.5%. 10.5% patients suffered ailments due to fall/trauma. The least common symptom was abdominal pain (7.5%). Other neurological symptoms constituted 8% and chest pain was the main presentation in 9.5% patients.Acute dyspnea in the elderly is often the consequence of multiple overlapping disorders, such as pneumonia, acute heart failure, COPD, anemia, hypertension, and ischemic heart disease. ED physicians must be trained well to recognize and manage acute dyspnea of uncertain cause and varying goals of care because of the associated comorbidities and decreased functional status. Infrastructure for invasive and non-invasive ventilation is limited to tertiary care hospitals and private corporate hospitals and is out of reach of the majority of the rural geriatric population. These two forms of ventilator support, though unavailable in most parts of the country, play a crucial role in early resuscitation for patients with acute dyspnea in the ED.

In a study by Abhilash et al[16], most common presenting complaints were breathing difficulty (28%), fever (21.6%),vomiting (14%), chest pain (11.5%), abdominal pain (11.5%),trauma including falls (11%), giddiness (10.4%), and altered sensorium (10%). These findings are similar to our study.

Most common cause was respiratory (33.5%) followed by metabolic (14%), cardiovascular (13.5%) and neurological (12.5%) and infectious (12.5%), followed by Gastrointestinal (7%), and then trauma (6%). Least common cause was neoplasm (0.5%) followed by genitourinary (1.5%) and anaphylaxis (1.5%) and renal (2.5%). With increasing number of comorbidities with age and age itself being a risk factor for coronary artery disease, it is not surprising to have myocardial ischemia/infarction as the leading cardiovascular emergency in the elderly. According to Abhilash et al[16], the most commonorgan systems involved are as follows: cardiovascularsystem (18.7%), respiratory system (15.8%), trauma (13.9%),genitourinary system (13.8%), neurological system (12.3%),skin and soft tissue infections (6%), and others (25.1%).In a study by GUP Iloh et al[18], the three most common causes of geriatricemergencies were acute malaria (33.8%), hypertensive crisissyndrome (19.0%), and acute hypertensive heart failure(18.1%).

The most common comorbidity found was Hypertension (51%), followed by Type II Diabetes Mellitus (38.5%). Hypothyroidism was found in 9.5% of Subjects. Amongst the Pre-existing Respiratory Illnesses, Chronic obstructive pulmonary disease and bronchial asthma was reported among 5 and 7.5% of the subjects respectively. Amongst the Cardiovascular Conditions, Coronary Artery Disease was found amongst 18% of Subjects, whereas Rheumatic Heart Disease and Dilated Cardiomyopathy were present in 2.5% each respectively. Chronic kidney disease was found in 7% of the subjects, while 2.5% Subjects had history of Old CVA, Psychiatric Disorder was present amongst 3% of Study Subjects, Malignancy constituted 2.5% and

Chronic Liver Disease constituted 1.5%, thus making it the least common comorbidity.In a study by Abhilash et al[16], among the respiratory conditions, acute exacerbation of asthma/chronic obstructive pulmonary disease (COPD) was the most common.

Among 200 patients, 58% patients required Hospital Admission, 27% went back home from the ED itself on oral medicines, and 15 % patients suffered death.Shahla Siddiqui et al[17] in their study found that overall mortality in ICU was 12%. Similarly in a study by Abhilash et al[16], more than half (51.5%) were discharged from ED, 47.5%(518 patients) were admitted in the hospital, and 0.91%(10 patients) expired in the ED.A further 64 patients expiredduring the hospital stay. The overall inhospital mortality amongthe geriatric emergencies was 6.8 (79/1090).

There are many socioeconomic challenges faced by the elderly population of India. Currently, most of the geriatric outpatientservices are available only at a few tertiary care hospitals inIndia. However, 75% of the elderly reside in rural areas, and it is essential that geriatric health care services be made a partof the primary health care services. Specialized training ofdoctors in geriatric medicine needs to improve and increaseon a large scale to meet the health demands of the second mostpopulous country in the world[19-21].

Conclusion:

The admission profile among this geriatric population showed that Respiratory Emergencies were the most common, followed by Metabolic, Cardiovascular, Neurological and Infectious, Gastrointestinal, Trauma and least common being Neoplasm. Anaphyllactic, Genitourinary and Renal constituted minor causes. ED of India should be aware of this demographic profile, sensitised to it, and be prepared to handle these emergencies efficiently. Also elderly patients present to the ED with higher acuity, more co-morbidities and more atypical presentation than younger adults.

ED should consider taking on the role of a tertiary injury prevention centre, and provide opportunistic screening for the at-risk elderly. This can provide an opportunity for early intervention. It is hoped that with early intervention, function can be preserved, future morbidity can be prevented and overall healthcare utilisation can be reduced. Due to the scarcity of data on geriatric emergencies from India, prospective follow-up studies are essential to truly understand the magnitude of the problem among the elderly.

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