



A Retrospective Study of Clinical Profile of Geriatric Patients Presenting to the Emergency Department in a Tertiary Care Hospital in South India

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ABSTRACT:

Background: The increasing number of geriatric visits to emergency departments (EDs) is a growing concern, driven by factors such as multiple coexisting medical conditions and declining physiological functions associated with aging. These factors contribute to organ failure, heightened susceptibility to infections, and increased utilization of healthcare resources. The primary objective of our study is to identify the most common presenting complaints and diagnoses among geriatric patients in the emergency department (ED), with a particular focus on symptoms associated with higher mortality. By recognizing these critical presentations early, we aim to implement timely and aggressive interventions to reduce mortality rates in this vulnerable population.

Materials and Methods: A retrospective study was conducted to analyze the clinical profiles and outcomes of geriatric patients aged over 60 years who presented to the emergency department between January 2024 to April 2024. Patient data were extracted from the institutional medical record database. **Results:** A total of 560 patient records were reviewed. The most frequently reported presenting complaints were breathlessness 154(27.5%), fever of either infectious or non-infectious etiology 96(17.2%), and altered sensorium 76(13.6%). The predominant diagnoses included Chronic Obstructive Pulmonary Disease (COPD) 64(11.4%) and urinary tract infections (UTIs) 54(9.6%). Among the 70 patients who succumbed, breathlessness was the most common presenting complaint 28(40%), followed by altered sensorium 12(17.1%). The principal causes of mortality were sepsis 20(28.5%) and respiratory failure 14(20%). **Conclusion:** Breathlessness is the most common presenting symptom in this demographic, with sepsis being the primary cause of death. The need for critical interventions such as mechanical ventilation, vasopressors, or intubation is strongly associated with poorer outcomes, highlighting the importance of early recognition and prompt management.



1. INTRODUCTION

Globally, the population is aging, with developing countries like India experiencing this demographic shift more rapidly than developed nations. India is undergoing demographic transition from high fertility, birth, and mortality rates to significantly lower levels of fertility, birth and death [1]. In 1994, individuals aged 60 and above comprised 9% of the global population; this figure rose to 12% by 2014 and is projected to reach 21% by 2050 [2]. The number of geriatric visits to the ED is on the rise, driven by factors such as multiple coexisting medical conditions—including hypertension, diabetes, cardiovascular and cerebrovascular diseases, obstructive airway disorders, and chronic kidney disease—as well as growing socioeconomic and financial challenges and limited healthcare resources [3-5].

Declining cellular function, eventually leading to organ failure, is part of the aging process. Therefore, aging is characterized by impaired adaptive and homeostatic mechanisms that cause an increased susceptibility to the stress of injury. The condition is commonly described as decreased physiologic reserve. Insults commonly tolerated by younger patients can lead to devastating results in elderly patients.

Managing elderly patients in the ED presents considerable challenges in modern healthcare. The demand for emergency services among this population is steadily increasing, with older adults now accounting for 20–30% of all ED visits. In comparison to younger patients, geriatric patients demonstrate a higher propensity for the appropriate utilization of emergency medical services. However, their clinical management is often more complex, demands more healthcare resources, and is frequently associated with worse outcomes [6].

Advancements in healthcare services and a decreasing mortality rate have likely played a role in this demographic transition, positioning India as an “aging nation” [7]. Nationwide, Emergency departments must be well-prepared to address this shift by recognizing atypical symptoms, understanding the diverse presentations of various illnesses, and tailoring care to the unique needs of geriatric patients. Adverse outcomes are more likely in the presence of significant frailty, diagnostic delays, and the progression of more severe disease [8]. However, there is a scarcity of research on this subject in India. Therefore, this study

was conducted to restructure emergency departments to better cater to the elderly population. The objective is to identify the predominant symptoms and clinical manifestations among geriatric patients presenting to the emergency department. To assess the duration of hospitalization and evaluate patient outcomes.

2. MATERIALS AND METHODS

Study design and study setting: A retrospective study was conducted from December 2024 to February 2025 in the department of emergency medicine of Karpaga Vinayaga Institute of Medical Sciences, Chengalpattu, Tamil Nadu, after obtaining approval from the Institutional Ethics Committee (No:IEC 1425/2023). The study aimed to analyze the clinical profiles and outcomes of geriatric patients aged over 60 years who presented to the emergency department between January 2024 and April 2024. Data were systematically collected using a structured case record form, encompassing demographic details, presenting complaints, comorbidities, length of hospital stay, final diagnoses, utilization of mechanical ventilation and inotropes, as well as patient outcomes, including discharge status, ICU admission, and mortality. **Inclusion Criteria:** All patients aged 60 years and above, regardless of gender, were considered for inclusion in the study. **Exclusion Criteria:** Patients who were discharged or left the emergency department against medical advice within 4 hours of presentation, as well as those with incomplete medical records, were excluded from the study. **Sample Size Calculation:** The prevalence of the most common presenting complaint and cause of death was breathing difficulty, reported as 29.42% by William Wilson et al (2021), in the recent edition of the Journal of Family Medicine and Primary Care. Based on this guide and assuming a 95% confidence interval, a 5% absolute precision value, and with the available population size of 2160. The minimum required sample size will be 278 ~ 290.

$$n = \frac{Z_{1-\frac{\alpha}{2}}^2 p(1-p)}{d^2}$$

Sampling Method: Universal sampling. **Study. Statistical Analysis:** All data were entered into a Microsoft Excel sheet and verified prior to analysis using IBM SPSS version 25.0. Categorical variables such as presenting complaints, diagnosis, comorbidities, and duration of hospital stay were summarized using frequencies and percentages. Inferential statistics were



performed using the chi-square test to assess the association between outcome parameters and the survival status of patients (alive or death), at 5% level of significance the $P < 0.05$ considered as significance

3.RESULTS

A total of 3256 patients were admitted during the study period from January to April 2024. Among them, 682 (21%) were geriatric patients. However, 122 (17.8%) were excluded from the study due to inadequate documentation or because they left against medical advice after admission. Therefore, 560 geriatric patients (82.1%) were included in the final analysis. The mean age of the participants was 71.64 ± 9 . A significant proportion of the participants 296 (52.9%) were aged between 60 and 70 years. The study sample showed a nearly equal gender distribution, comprising 277 (49.4%) males and 283 (50.5%) females.

Tobacco use was reported by 64 (11.4%) of patients, and 136 (24.3%) consumed alcohol. Out of the 560 patients, 196 (35%) were admitted to the ICU, and 70 (35.8%) of these 196 ICU patients have died in hospital. The most common presenting complaints summarised in Table 1, were breathlessness 154 (27.5%), fever with or without localisation 96 (17.2%), and altered sensorium 76 (13.6%). The most frequent diagnoses summarised in Table 2, included Chronic Obstructive Pulmonary Disease (COPD) 64 (11.4%), urinary tract infection (UTI) 54 (9.6%), acute cerebrovascular accident (CVA) 46 (8.2%), heart failure 40 (7.1%), and pneumonia 36 (6.4%).

Comparing mortality with presenting complaints on Table 3, the most common symptoms among deceased patients were breathlessness 28 (40%), altered sensorium 12 (17.1%), abdominal pain 8 (11.4%), chest pain 8 (11.4%), and giddiness 8 (11.4%). The leading causes of death on Table 4, were sepsis 20 (28.5%), respiratory failure 14 (20%), myocardial infarction 8 (11.4%), heart failure 6 (8.5%), and acute pulmonary oedema (non cardiac) 6 (8.5%).

There is a significant increase in mortality among patients receiving inotropic agents and mechanical ventilation compared to those not receiving such interventions ($P < 0.05$) (Table 5). Notably, patients who received inotropes had a significantly higher in-hospital mortality rate compared to those who did not. A significant proportion of ICU deaths occur within the first 24 hours of admission (Table 5)

Table 1: Descriptive Statistics of Presenting Complaints in Study Participants n = 560

Presenting complaint	n	%
Abdominal pain	54	9.6
Abnormal movement of upper and lower limb	10	1.8
Altered sensorium	76	13.6
Bleeding Per vagina or Per rectum	8	1.4
Breathlessness	154	27.5
Burning micturition	52	9.3
Chest pain	22	3.9
Fall	32	5.7
Fever*	14	2.5
Giddiness	60	10.7
Loose stool and vomiting	12	2.1
Lower back pain	2	0.4
Swelling	30	5.4
Vomiting	12	2.1
Weakness of upper and lower limb	22	3.9

*Fever without localisation

Table 2: Descriptive Statistics of Final Diagnosis in Study Participants

Final Diagnosis	n	%	Final Diagnosis	n	%
Acute abdomen	24	4.3	Fracture	32	5.7
Acute Cerebrovascular accident	46	8.2	Heart failure	40	7.1
Acute febrile illness	14	2.5	Myocardial infarction	18	3.2



Acute gastritis	44	7.9	Others	12	2.1
Acute pulmonary oedema	12	2.1	Pneumonia	36	6.4
Carcinoma	22	3.9	Pulmonary tuberculosis	14	2.5
CNS disorder	12	2.1	Respiratory failure	10	1.8
Chronic obstructive pulmonary disease	64	11.4	Sepsis	34	6.1
Diabetic Emergencies	24	4.3	Soft tissue infection	24	4.3
Encephalopathy	24	4.3	Urinary tract infection	54	9.6

Table 3: The frequency table of Mortality and Associated Presenting Complaints Among Geriatric patients (n = 70)

Presenting Complaints	Mortality n	%
Abdominal pain	8	11.4
Altered sensorium	12	17.1
Bleeding Per vagina or Per rectum	2	2.9
Breathlessness	28	40
Chest pain	8	11.4
Fall	2	2.9
Giddiness	8	11.4
Loose stool and vomiting	2	2.9

Table 4: Descriptive Statistics of Mortality and Diagnosis among Geriatric Patients (n = 70)

Diagnosis	Mortality	%
Acute abdomen	2	2.9
Acute Cerebrovascular accident	4	5.7
Acute pulmonary edema	6	8.6
Carcinoma	4	5.7
Encephalopathy	2	2.9
Fracture	2	2.9
Heart failure	6	8.5
Myocardial infarction	8	11.4
Others	2	2.9
Respiratory failure (Including pneumonia and Chronic obstructive pulmonary disease)	14	20
Sepsis	20	28.5

Table 5 The Association Between Outcome Parameter and Survival Status Among Geriatric Patients

Outcome Parameters	Alive n = 490 (%)	Death n = 70 (%)	Chi-square value	P value
Age in Years				
< 70	266 (54.3)	30 (42.9)	$\chi^2 = 1.799$	P = 0.407



70 - 80	158 (32.2)	30 (42.9)		
> 80	66 (13.5)	10 (14.3)		
Duration of Hospital Stay in Days				
≤ 1	74 (15.1)	30 (42.8)	$\chi^2 = 16.037$	P= 0.000*
2-5	212 (43.2)	24 (34.2)		
> 5	204 (41.6)	16 (22.8)		

Treatment Parameters

Mechanical Ventilation-Invasive				
No	482 (98.4)	54 (77.1)	$\chi^2 = 33.632$	P = 0.000*
Yes	8 (1.6)	16 (22.9)		
Mechanical Ventilation-Non-Invasive				
No	436 (88.9)	52 (74.2)	$\chi^2 = 5.902$	P = 0.015*
Yes	54 (11.0)	18 (25.7)		
Inotropes				
No	462 (95.5)	44 (62.9)	$\chi^2 = 41.667$	P = 0.000*
Yes	22 (4.5)	26 (37.1)		

Co - Morbidities

Diabetes				
No	192 (39.2)	36 (51.4)	$\chi^2 = 1.902$	P = 0.168
Yes	298 (60.8)	34 (48.6)		
Hypertension				
No	260 (53.1)	44 (62.9)	$\chi^2 = 1.184$	P = 0.277
Yes	230 (46.9)	26 (37.1)		
Coronary Artery Disease				
No	410 (83.7)	52 (74.3)	$\chi^2 = 1.869$	P = 0.172
Yes	80 (16.3)	18 (25.7)		
Chronic Kidney Disease				
No	448 (91.4)	58 (82.9)	$\chi^2 = 2.582$	P = 0.180*
Yes	42 (8.6)	12 (17.1)		
Cerebrovascular Accident				
No	452 (92.2)	56 (80.0)	$\chi^2 = 5.451$	P = 0.020*



Yes	38 (7.8)	14 (20.0)		
Obstructive Airway Disease				
No	458 (93.5)	58 (82.9)	$\chi^2 = 4.764$	P = 0.029*
Yes	32 (6.5)	12 (17.1)		

*Chi-square test at 5 % level of significant, P < 0.05 considered as significance

4.DISCUSSION

The aging of the global population stands as a pivotal social transformation of the 21st century, Elderly people of this generation will live longer than the preceding one and will have access to high quality health care. This demographic shift has profound implications for healthcare systems, particularly in emergency departments (EDs), where elderly patients often present with complex medical needs.

In our study, geriatric patients constituted 21% of ED visits, a figure that aligns with previous research by Nidhi Kaeley et al., who reported a prevalence of 27.5%[9], and Abhilash et al., who reported a prevalence of 13.9%[7]. Among the 560 geriatric patients analysed, the in-hospital mortality was 70(12.5%). The most common presenting complaint was breathlessness 154(27.5%), primarily attributed to respiratory 89(57.7%) and cardiovascular 52(33.8%) and metabolic 13(8.5%) conditions. Fever was the second most common complaint 96(17.2%), with infectious origin accounting for 71(73.9%) and non-infectious origin 25(26%). Among geriatric patients, infections often manifest with subtle or atypical signs. Fever, though traditionally associated with infection, can also be indicative of a non-infectious condition [10]. Altered sensorium was the third most frequent complaint 76(13.6%), predominantly due to metabolic encephalopathy (86.2%), and was notably the second most common complaint among patients who died, underscoring its clinical significance. Giddiness 60(10.7%) was the fourth most common complaint, often resulting from cerebrovascular accidents 20(33.3%), with ischemic strokes comprising 45(75%) and hemorrhagic strokes 15(25%) of these cases. In the study by Abhilash et al., the most commonly affected organs were the cardiovascular system (18.7%), followed by the respiratory system (15.8%) and trauma-

related cases (13.9%) [7]. Elderly patients often present with non-specific complaints such as fatigue, confusion, and generalized weakness. These presentations are associated with higher hospital admission rates and increased 30-day mortality compared to specific complaints like chest or abdominal pain [11,12].

Trauma in the elderly presents unique challenges. In addition, the ever-increasing mobility and active lifestyle of today's elderly individuals placed them at increased risk of serious injury, in our study fractures were observed in 32(5.7%) of geriatric patients, with the femur 18(56.2%), vertebrae 8(25%), and ribs 4(12.5%) being the most commonly affected sites. These injuries were primarily due to self-falls or slips, contrasting with younger adults, where road traffic accidents are more prevalent.

The leading causes of death in our study were sepsis 20(28.5%), respiratory failure 14(20%), myocardial infarction 8(11.4%), heart failure 6(8.5%), and acute pulmonary oedema of non-cardiac origin 6(8.5%). Pre-existing conditions such as cerebrovascular accidents (CVA) and obstructive airway disease (OAD) were significantly associated with increased mortality (p=0.000), consistent with findings by William et al., who reported that most comorbidities elevated the odds of mortality, except for diabetes mellitus and chronic kidney disease[2].

The duration of hospital stay emerged as a significant factor in patient outcomes. Among geriatric patients, the length of hospitalization was notably longer than that of younger individuals, regardless of triage category severity. In our study, 244 patients (43.5%) had hospital stays exceeding five days. Interestingly, the highest proportion of deaths occurred within the first 0–1 day of admission, accounting for 30 fatalities (42.8%). No statistically significant correlation



was observed between age and recovery outcomes, consistent with previous findings [13]. Moreover, the requirement for mechanical ventilation—both invasive and non-invasive—as well as inotropic support, was significantly associated with increased mortality ($p = 0.000$). These findings align with those of William et al., who reported that the use of such critical interventions substantially elevates the risk of in-hospital death [2]. Similarly, the study by Mukhopadhyay et al. highlighted that the need for mechanical ventilation, vasopressor administration and neurological disease were independently associated with hospital mortality, irrespective of patient age [14]. This reinforces the notion that the severity of clinical interventions and comorbid conditions are stronger predictors of mortality than chronological age alone.

Our study's retrospective nature and limitations, including incomplete documentation, unreliable socioeconomic and medical histories, and its setting in a tertiary care centre, may introduce selection and referral biases. Despite these constraints, the findings underscore the necessity for tailored emergency care approaches for the geriatric population, considering their unique clinical presentations and higher vulnerability to adverse outcomes.

5. CONCLUSION

Elderly patients exhibit higher rates of hospital and ICU admissions, accompanied by increased in-hospital mortality. Common presenting symptoms include breathlessness and altered sensorium. Notably, comorbidities such as cerebrovascular accidents (CVA) and obstructive airway diseases (OAD) further elevate mortality risks. The necessity for mechanical ventilation (NIV and INV) and inotropic support has been identified as an independent predictor of increased mortality among elderly ICU patients. Early recognition of symptoms, vigilant monitoring for red flag signs, and prompt, aggressive resuscitation are critical strategies to mitigate mortality risks in this vulnerable population.

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6. REFERENCES

1. Jane Osareme, Ogugua 1, MuridzoMuonde 2, Chinedu Paschal Maduka 3, Tolulope O Olorunsogo 4 and Olufunke Omotayo. Demographic shifts and healthcare: A review of aging populations and systemic challenges. International Journal of Science and Research Archive, 2024. e DOI: <https://doi.org/10.30574/ijjsra.2024.11.1.0067>
2. Wilson W, Ravindra P, Khasage UJ, Raj JP, Jain V, Bose B, et al. Clinical profile, outcomes and predictors of mortality in elderly patients admitted to the Emergency Medicine Intensive Care Unit of a teaching hospital – A single-center registry. J Family Med Prim Care 2021;10:3791-6 DOI:10.4103/jfmprc.jfmprc_630_21
3. Dr. Varsha s shinde¹, dr. justin samuel², akhil r³, dr. g. dhruvakumar reddy⁴, dr. rebeccasusan gladvin⁵, dr. prerna verma⁶, dr. deepu palal⁷, dr. anjeethputhooranilkumar. profile of geriatric patients presenting to the emergence department 10.47750/pnr.2023.14.02.242
4. Graham Ellis, Trudi Marshall, Claire Ritchie, Comprehensive geriatric assessment in the geriatric department .2014 Nov 24 ; Nov 24;9:2033–2043. doi: 10.2147/CIA.S29662
5. Malik C, Khanna S, Jain Y, Jain R. Geriatric population in India: Demography, vulnerabilities, and healthcare challenges. J Family Med Prim Care. 2021 Jan;10(1):72-76. doi: 10.4103/jfmprc.jfmprc_1794_20. Epub 2021 Jan 19. PMID: 34017706; PMCID: PMC8132790.
6. Salvi F, Morichi V, Grilli A, Giorgi R, De Tommaso G, Dessi-Fulgheri P. The elderly in the emergency department: a critical review of problems and solutions. Intern Emerg Med. 2007 Dec;2(4):292-301. doi: 10.1007/s11739-007-0081-3. Epub 2007 Nov 28. PMID: 18043874.



7. Abhilash KP, Kirubairaj MA, Sahare SR. Profile of geriatric patients presenting to the emergency department. *Curr Med Issues* 2017;15:227-30 DOI:10.4103/cmi.cmi_22_17
8. Samaras N, Chevalley T, Samaras D, Gold G. Older patients in the emergency department: a review. *Ann Emerg Med*. 2010 Sep;56(3):261-9. doi: 10.1016/j.annemergmed.2010.04.015. PMID: 20619500.
9. Nidhi Kaeley, Jainendra Kumar, Manish Kumar², Nagasubramanyam Vempalli, Mridul Dhar, Bharat B Bhardwaj, Subodh Kumar, Ankita Kabi, Poonam Arora, Prevalence and pattern of geriatric emergencies in a teaching hospital of North India, 2021 *Journal of Family Medicine and Primary Care* DOI: 10.4103/jfmpc.jfmpc_2450_20
10. Cagatay AA, Tufan F, Hindilerden F, Aydin S, Elcioglu OC, Karadeniz A, Alpay N, Gokturk S, Taranoglu O. The causes of acute Fever requiring hospitalization in geriatric patients: comparison of infectious and noninfectious etiology. *J Aging Res*. 2010 Aug 12;2010:380892. doi: 10.4061/2010/380892. PMID: 21151521; PMCID: PMC2989655.
11. Karin Erwander ,Kjellvarsson, Mona Landin Olsson, Elderly patients with non-specific complaints at the emergency department have a high risk for admission and 30-days mortality *BMC Geriatrics* 2024 Jan 3;24 DOI: 10.1186/s12877-023-04621-7
12. Simon Jones , Chris Moulton , Simon Swift , Paul Molyneux, Steve Black , Neil Mason , Richard Oakley , Clifford Mann , Association between delays to patient admission from the emergency department and all-cause 30-day mortality, *Emerg Med J* 2022; ttp:// dx. Doi:10.1136/emered-2021-211572
13. Pruthi Prabhudev¹, Kusugodlu Ramamoorthi¹, Raviraja V Acharya , A Clinical and Demographic Profile of Elderly (>65 Years) in the Medical Intensive Care Units of a Tertiary Care Center, *pubmedindian J Crit Care Med* 2023 Mar;27(3):166-175. DOI: 10.5005/jp-journals-10071-24416.
14. Mukhopadhyay A, Tai BC, See KC, Ng WY, Lim TK, Onsiang S, Ee S, Chua MJ, Lee PR, Loh ML, Phua J. Risk factors for hospital and long-term mortality of critically ill elderly patients admitted to an intensive care unit. *Biomed Res Int*. 2014;2014:960575. doi: 10.1155/2014/960575. Epub 2014 Dec 16. PMID: 25580439; PMCID: PMC4280808.