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Clinical Profile and Outcomes of Geriatric Patients Admitted to Level III Intensive Care Unit of a Tertiary Care Hospital of Nepal: A Retrospective Observational Study

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ABSTRACT

Background and aims: Ageing global population results in an increasing burden of critically ill elderly patients requiring intensive care. Data on clinical characteristics and outcomes of geriatric patients in intensive care unit (ICU) of Nepal is limited. This study aimed to evaluate the clinical profile and outcomes of geriatric patients admitted to a level III ICU of a tertiary care hospital in Nepal.

Methods: This retrospective observational study was conducted using registry data from the Nepal Intensive Care Research Foundation (NICRF). Patients aged ≥60 years admitted to the ICU of the Hospital of Advanced Medicine and Surgery (HAMS) between April 1, 2024, and March 31, 2025, were included in the study. Patients with incomplete data or ICU stay <24 hours were excluded. Demographic characteristics, comorbidities, admission patterns, organ support requirements, and outcomes were studied.

Results: A total of 437 geriatric patients were included, representing 56.9% of total ICU admissions. The mean age was 74.6±8.7 years. Most admissions occurred through the emergency department (68.4%) and were medical cases (86.5%). Mechanical ventilation was required in 14.1% of patients, vasopressors in 19.4%, and renal replacement therapy in 1.4%. The median ICU length of stay was 3 days (IQR 2–5). Overall ICU mortality was 6.2% (n=27).

Conclusion: Geriatric patients constituted a substantial proportion of ICU admissions in this tertiary care center. Although comorbidity burden was high, overall outcomes were comparable to younger age groups suggesting that clinically meaningful outcomes can be achieved in elderly critically ill patients with appropriate utilization of ICU resources.

Key words: *Elderly; geriatric; intensive care unit; outcome*

INTRODUCTION

The elderly people constitute nearly 9.1% of the world population in 2019 A.D. and the proportion of individuals over the age of 80 years is estimated to triple by the year 2050 A.D.[1] As populations age globally, Nepal is no exception to this demographic trend, posing unique challenges for healthcare system. Older adults in Nepal are usually addressed as "Jestha Nagarik" or "Senior Citizens" in accordance with the definition provided by the Senior Citizens Act of Nepal, 2063 B.S. (2006 A.D.), which designates a senior citizen as "a citizen of Nepal having completed the age of sixty years".[2]

According to the 2021 national census, Nepal is home to approximately 2.97 million people aged 60 years and above, which is a 38.2% increase compared to the previous census of 2011. The proportion of the older population is 10.21% of the total population of Nepal.[3] While the national population is growing at an average annual rate of 0.92%, the elderly population is increasing much faster, at about 3.3% per year. The average life expectancy has reached about 71 years. These demographic trends indicate a rapidly ageing society.[4] An aging population with increasing comorbidity and frailty explains why the proportion of older adults requiring intensive care is increasing globally and in Nepal.[5] Over the past two decades, medical advances have enabled elderly patients to undergo complex procedures and surgeries, leading to a growing demand for intensive care. Elderly patients in ICU account for 20-30 % of all the admissions. This trend creates a significant demand for healthcare resources, including both bed capacity and specialized healthcare professionals.[6,7]

Data on clinical profile of elderly patients from low and middle-income countries, including Nepal, remain sparse. Understanding factors associated with outcomes in this population can help clinicians in prognostication, counselling, triage and policy formation for resource limited settings.[8,9] The aim of this study is to evaluate clinical profile and outcome of geriatric patients (aged ≥60 years) admitted to level III ICU of a tertiary care hospital in Nepal.

METHODS

This was a retrospective observational study conducted using registry data obtained from the Nepal Intensive Care Research Foundation (NICRF). The study was conducted in the ICU of the Hospital of Advanced Medicine and Surgery (HAMS), a private tertiary care center of Nepal. This is a level III multidisciplinary ICU located in the capital city of Nepal and admits mixed medical and surgical patients. It is well equipped to provide advanced organ support and multidisciplinary care involving specialists from various departments who are available as required. The ICU is staffed by trained intensivists, resident doctors and critical care trained nurses. Ethical approval was obtained from the Institutional Review Committee of HAMS (Ref: HAMS/IRC No. 15-2025; dated 9 December 2025).

All patients aged ≥60 years admitted to the ICU of HAMS during the one-year study period (April 1, 2024 to March 31, 2025) were included in the study. Patients with incomplete or missing data and those admitted for less than 24 hours were excluded. A non-probability consecutive sampling method was used. All patients admitted to the ICU during the study period were screened from the registry database, and all eligible patients were included in the study.

The clinical and demographic data of the patients, including age, gender, comorbidities, and primary diagnosis at ICU admission, were obtained from the ICU registry. Clinical data, including organ system involvement and interventions (mechanical ventilation, vasopressors, and renal replacement therapy) were reviewed. ICU outcomes, including mortality, length of ICU stay, and discharge disposition (discharge or leave against medical advice) were recorded.

The data were entered and analyzed using Microsoft Excel 2019. Categorical variables were expressed as frequencies and percentages. The normality of continuous variables was assessed prior to the analysis. Continuous variables were expressed as mean with standard deviation or median with interquartile range.

RESULTS

During the one-year study period, a total of 767 patients were admitted to the ICU, of whom 437 (56.9%) were aged above 60 years and thus included in the study. None met the exclusion criteria. The mean age of the study population was 74.6 ± 8.7 years (median 74, IQR 68–81; range 60–102 years). The majority of patients were between 70–79 years (41.2%), followed by 60–69 years (29.1%) and 80–89 years (24.2%); patients aged ≥90 years comprised 5.5% of the cohort (Figure 1)

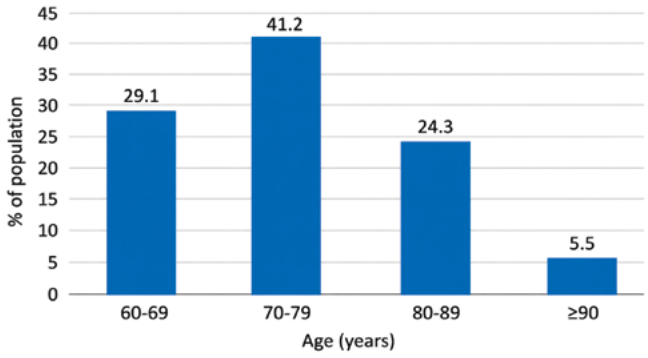

Figure 1. Bar diaphragm of the age distribution of patients in percentage

Of the total elderly patients, 246 (56.3%) were male and 191 (43.7%) were female. The most common source of ICU admission was the emergency department (299, 68.4%), followed by the general ward (59, 13.5%), operating room (55, 12.5%), and high-dependency unit (24, 5.4%). The majority of cases were medical admissions (378, 86.5%), whereas 59 (13.5%) were surgical (Table 1). Among surgical cases, 51 were elective and 8 were emergency procedures, with cardiac surgeries being the most frequent.

Table 1. Clinical profile of study population (n= 437)

Characteristics	Number of patients (%)
Age (years)	
60–69	127 (29.1)
70-79	180 (41.2)
80-89	106 (24.3)
≥90	24 (5.5)
Sex	
Male	246 (56.3)
Female	191 (43.7)
Source of ICU Admission	
Emergency department	299 (68.4)
General ward	59 (13.5)
Operation room	55 (12.5)
HDU	24 (5.4)
Type of admission	
Medical	378 (86.5)
Surgical	59 (13.5)
Elective	51 (86.4)
Emergency	8 (13.6)
Comorbidities	
≥1	334 (76.4)
≥2	240 (54.9)

HDU: High Dependency Unit

Comorbidities were common among medical patients; 334 (76.4%) had at least one comorbid condition, and 240 (54.9%) had two or more. Regarding outcomes, 373 (85.3%) patients improved and were transferred out of the ICU, while 27 (6.2%) died during their ICU stay. A total of 19 (4.3%) had withdrawal of life support and 18 (4.1%) patients left against medical advice (LAMA) (Table 2). Among survivors, 247 (66.2%) were transferred to the general ward, 81 (21.7%) to the high dependency unit (HDU), 25 (6.7%) patients were discharged home, 19 (5.1%) went to other centers, and one patient was discharged home for end-of-life care.

The median ICU length of stay was 3 days (IQR 2–5), with a mean stay of 4.6 ± 6.1 days. The ICU length of stay ranged from 1 to 55 days. With respect to organ support, 62 (14.1%) patients required invasive mechanical ventilation, 64 (14.6%) required non-invasive ventilation, and 12 (2.7%) were managed with high-flow nasal cannula (HFNC). Vasopressor support was needed in 85 (19.4%) patients, while 6 (1.4%) required renal replacement therapy.

Table 2. Outcome of study population (n= 437)

Characteristics	Number of patients (%)
Improved / transferred out	373 (85.3)
General ward	247 (66.2)
HDU	81 (21.7)
Home	25 (6.7)
DOPR to other center	19 (5.1)
End of life care at home	1 (0.2)
ICU mortality	27 (6.2)
Withdrawal of life support	19 (4.3)
LAMA	18 (4.1)
Organ support	
Invasive MV	62 (14.1)
Non-invasive MV	64 (14.6)
HFNC	12 (2.7)
Vasopressors	85 (19.4)
RRT	6 (1.4)

HDU: High Dependency Unit; DOPR: Discharged On Patient's Request; LAMA: Leave Against Medical Advice; HFNC: High Flow Nasal Cannula; RRT: Renal Replacement Therapy.

DISCUSSION

In this retrospective observational study from a level III ICU of a private tertiary care center in Nepal, geriatric patients (aged ≥60 years) constituted more than half of all ICU admissions (56.9%), indicating a high burden of critical illness among older adults. This was higher than as compared to other tertiary care center in Nepal[9] which might be due to different patient population and variable reasons for ICU admission in different center. The mean age of 74.6 years, with the largest proportion of patients in the 70–79-year age group, reflects the demographic shift toward an aging population requiring critical care services which is comparable to similar study done in India by Prabhudev et al.[10]

The overall ICU mortality of 6.2 % observed in our cohort is lower than in studies done in India by Wilson et al.[11] and in Singapore by Mukhopadhyaye et al.[12] The finding was lower than another study reported in Nepal by Bhandari et al.[9] These findings suggest that outcomes among elderly critically ill patients may vary across healthcare settings and should be interpreted in the context of local patient populations and available resources. The observed male predominance in ICU admissions in our study is consistent with findings from other tertiary care centers in Nepal.[9,13] This pattern likely reflects sociocultural influences on healthcare access, gender differences in health-seeking behaviour, and the higher burden of certain chronic comorbidities among elderly males.

Comorbidities were highly prevalent in this cohort, with more than three-quarters of patients having at least one comorbid

condition and over half having two or more. This is consistent with previous studies demonstrating a high comorbidity burden among elderly ICU patients.[7,14] The presence of multiple comorbidities reflects reduced physiological reserve and increased vulnerability to acute illness, which may partly explain the need for advanced organ support in a subset of patients.[8] These findings emphasize the importance of comprehensive geriatric assessment and careful consideration of baseline health status when managing critically ill older adults.

In this study, most ICU admissions were medical cases rather than surgical ones, and nearly two-thirds of patients were admitted from the emergency department. Among the surgical patients, most were elective cardiac surgeries. This suggests that ICU care was mainly used for high-risk but treatable conditions, which may have helped achieve the overall good outcomes seen in the study.

The median ICU length of stay was 3 days, indicating that most patients required only a brief period of intensive care. This finding was similar to Lee et al[15] and less than Prabhudev et al.[10] The mean length of stay was slightly higher due to a smaller number of patients who required prolonged ICU care. This variation indicates a heterogeneous patient population in which some patients improved rapidly and were transferred out of the ICU early, while others required extended monitoring and organ support due to greater illness severity or complications.

Invasive mechanical ventilation was required in 14.1% of patients, vasopressors in 19.4%, and renal replacement therapy in only 1.4%. These relatively low rates may reflect a combination of factors, including early ICU admission, differences in case mix and selective ICU admission practices. The lower utilization of intensive treatment modalities in the elderly population may be attributed to a cautious approach by both family members and clinicians due to concerns regarding age-related frailty and treatment tolerability, prioritizing patient comfort over aggressive treatment.

Withdrawal of life support was documented in 19 (4.3%) patients. This observation suggests that continuation of intensive care treatment was reconsidered in some critically ill patients after family discussion, likely due to poor prognosis, severe illness, financial constraints, or patient/family preference. Additionally, 18 (4.1%) patients left against medical advice (LAMA). In resource-limited settings, LAMA is often related to financial burden, perceived poor prognosis and cultural beliefs. Overall, these findings reflect not only medical factors but also social, economic, and end-of-life decision-making practices that influence ICU outcomes in Nepal.[16]

Advanced age by itself is not a reliable predictor of poor outcomes in critically ill patients. Instead, prognosis is more strongly influenced by factors such as pre-admission functional and cognitive status, severity of the acute illness, degree of organ dysfunction, burden of comorbidities, and the requirement for advanced organ support including mechanical ventilation, vasopressors, and renal replacement therapy. Although various prognostic scoring systems are available to estimate survival in critical care, these tools are not specifically designed for very elderly populations. Moreover, they frequently do not adequately account for important determinants such as comorbidity burden, baseline functional ability, and pre-existing cognitive impairment prior to ICU admission.[17,18,19]

Improving geriatric care in the ICU is important not only for better survival and recovery but also for reducing healthcare costs and making better use of limited critical care resources.[7,20,21] This study included a clearly defined geriatric ICU population, providing focused insight into outcomes among elderly critically ill patients. Data were collected from a routine clinical ICU setting, which improves the applicability of the findings to everyday clinical practice. However, this study has few limitations. This is a retrospective single-center study that may limit generalizability. Severity-of-illness scores such as acute physiology and chronic health evaluation (APACHE) or sequential organ failure assessment (SOFA) were not included in the study that could have helped in interpreting mortality results. Additionally, inclusion of patients who left against medical advice in the poor outcome group may have influenced outcome estimates.

CONCLUSION

This study demonstrates that geriatric patients constitute a substantial proportion of ICU admissions in a tertiary care hospital in Nepal, reflecting the ongoing demographic transition toward an ageing population. These findings highlight the growing demand for geriatric-focused critical care services in resource-limited settings. Future prospective multicenter studies are warranted to better understand predictors of outcomes and to guide policy development for geriatric critical care in Nepal.

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DISCLOSURE

None.

CONFLICT OF INTEREST

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