

Original Research Article

Retrospective review of profile of intensive care unit admissions and outcomes in a tertiary care hospital of Himalayan region

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ABSTRACT

Background: An Intensive care unit (ICU) is an area where highest level of care is given with close invasive and non-invasive monitoring to a critically ill patient. Medical audit is must to assess the quality care provided and lay down policies for future. Objectives: To review retrospectively the profile of patients admitted to ICU and assess their outcome.

Methods: From January 2016 to December 2016, ICU records of all admissions, referred, discharges, and deaths were utilized for the purpose of this study. Data extracted from the records included age, sex, diagnosis and outcome.

Results: A total of 2316 patients were admitted to ICU. Males were 1489 (64.3%) and females were 827 (35.7%). Most of the patients (42.8%) were between 46-70 years. Most of the patients were shifted from emergency (48.5%) and it was associated with better outcome. A total of 49.6% patients were shifted out of ICU in stable condition while mortality was 28.6%. Around 21.8% patients left ICU against Medical advice.

Conclusions: Majority patients admitted to ICU were of general medicine and neurosurgery. Survival was inversely related to age. Mortality was not associated with sex. Outcome was also related to the source from where patient was admitted.

Keywords: Intensive care unit, Medical audit, Outcome

INTRODUCTION

Intensive care units (ICU) are the areas where patients with severe and life-threatening illnesses and injuries require constant, close monitoring and support from specialist equipment and medications in order to ensure normal bodily functions.¹ An ICU has trained doctors and nurses who specialize in treating critically ill patients.^{2,3} ICUs are also different from normal hospital wards by a higher staff-to-patient ratio and access to advanced medical resources and equipment that is not routinely available elsewhere. However, stay in ICU involves larger expenditure too.⁴ Not all patients who have potentially recoverable disease can afford the expenditure

of ICU. Similarly, the outcome of a critically ill patient is also not certain as it depends on multiple factors.⁵ However if we assess the trends of outcome of an ICU on a regular basis, we not only analyses the profile of patients getting admitted to a particular ICU but also the care given to them. This will give us an insight to areas where more focus is to be given. In our medical institute, we have the privilege of having the largest bedded intensive care in the whole Himalayan region of Uttarakhand. We have 40 bedded ICU with all modern machines and Equipments. It has started functioning since 27th Jan 2016. The present study is done to provide information about the trend of admissions to the ICU of Himalayan region and their outcome. We have tried to

figure out any association between age and outcome and primary disease and outcome. It will be a source of information to the institute as well as to adjoining area about the results of this ICU and will mark as a bench mark for future studies and references.

METHODS

This retrospective study reviewed the admissions into the ICU of a Himalayan Hospital under Swami Ram Himalayan University (Uttarakhand) in India from January 2016 to December 2016. ICU records of all admissions, referred, discharges, and deaths were utilized for the purpose of this study. Data extracted from the records included age, sex, diagnosis and outcome. Outcome is classified as discharge, shift out, referred, left against medical advice (LAMA), discharge on patient request (DOPR) and death. Shift out was further classified as shift out to ward, high dependency unit. Ethical approval was obtained from Institutional Ethical Committee. Data was analyzed using Microsoft Excel 2007 and the Statistical Package for Scientific Solutions (SPSS) version 22.0. Proportions were calculated and Chi square test was used as a test for significance. A p value of less than 0.05 was considered significant.

RESULTS

During the above said period a total of 2316 patients were admitted in the ICU. There were total 1489 (64.3%) males and 827 (35.7%) females giving male:female ratio of 1.8:1 (Figure 1) Amongst the patient admitted to ICU, age range was 2 months to 96 years with mean of 46.7 years. The age distribution reveals that 242 (10.2%) patients were below 18 years of age, 838 patients (36.4%) were between 19-45 years of age, 990 patients (42.8%) were between 46-70 years of age and 246 patients were more than 71 years of age.

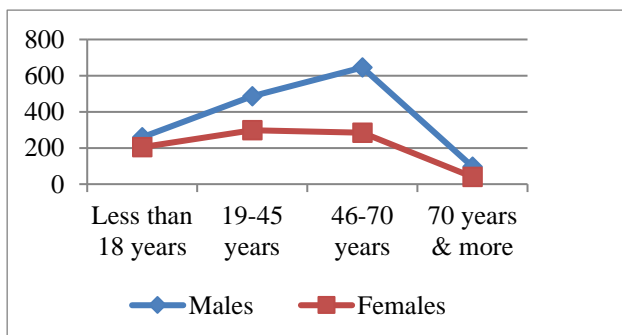


Figure 1: Graphical representation of admissions based on sex in different age groups.

Majority of patients i.e. 1123 (48.5%) were shifted to ICU from emergency. This was followed by high dependency unit (HDU) 560 (24.2%) and wards 425 (18.3%). Only 208 (9%) patients were shifted from operation theatre.

Amongst the departments, maximum number of patients (n = 608, 26.1%) were admitted under general medicine. This was followed by neurosurgery (n= 298, 12.9%), general surgery (n = 257, 11.1%), pulmonary medicine (n = 250, 10.8%), neurology (n = 180, 7.8%). Rest 31.3% patients were from various departments like pediatrics, orthopedics, gynecology, cardiology, nephrology, gastroenterology, oncology, urology, eye and ENT (Figure 2).

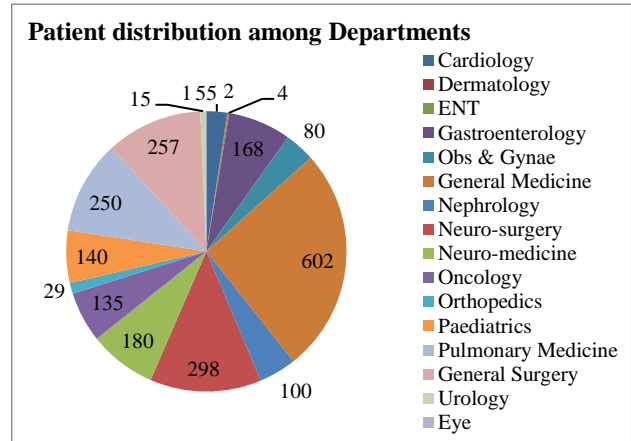


Figure 2: A pie chart to tell various admissions in ICU from various departments.

Out of 2316 patients admitted to ICU, 1149 (49.6%) were shifted out, 661 (28.6%) patients died while 506 (21.8%) patients left the ICU against medical advice due to various socio-economic reasons.

On comparing the death among different age groups, we found that maximum percentage of expiry was there in age group of >70 years i.e. (36.2%) followed by 46-70 years of age (30.7%) and minimum deaths were amongst pediatric age group i.e. 20.7%. Percentage of death was significantly associated with increasing age (p-value 0.000) (Table 1).

Table 1: Association of outcome with age and its significance.

		Shift out	LAMA	Expired	Total
Age in years	<18	151	41	50	242
	19-45	463	157	218	838
	46-70	439	246	304	990
	>70	96	61	89	246
Total		1149	505	661	2316
Chi-square tests					
		Value	Df	Asymp. Sig. (2-sided)	
Pearson chi-square		51.037 ^a	9	0.000	

When comparing the outcome amongst male and female it was observed that among female patients 49.1% (406 females) were shifted out while 245 (29.6%) expired.

While among male patients; 743 (4.8%) were shifted out and 416 (27.9%) males expired. Death among ICU patients was not found to be associated with sex of patient (p-value = 0.725) (Table 2).

Table 2: Association of Sex with outcome and its significance.

Sex vs outcome					
		Shift out	LAMA	Deaths	Total
Sex	F	406	176	245	827
	M	743	329	416	1489
Total		1149	505	661	2316
Chi-square tests					
		Value	Df	Asymp. Sig. (2-sided)	
Pearson chi-square		1.317 ^a	3	0.725	

On comparing the outcome of patient with the area from where patient was shifted to ICU, we found that better outcome was there in patients who were shifted from emergency as compared to those patients who were shifted from wards or HDU. This was found to be statistically significant (p-value =0.000) (Table 3).

Table 3: Association of outcome with area of inflow and its significance.

	Shift out	LAMA	Death	Total	
HDU	212	135	13	560	
Emergency	586	264	73	1123	
OT	155	14	39	208	
Wards	196	93	136	425	
Total	1149	505	661	2316	
Chi-square tests					
		Value	Df	Asymp. Sig. (2-sided)	
Pearson chi-square		106.634 ^a	9	0.000	

DISCUSSION

The intensive care unit of our hospital is state of the art, equipped with all modern Equipments for non-invasive and invasive hemodynamic monitoring and is the largest (40 bedded) intensive care in the entire region. It includes ICU for medical, surgical, neuro, obstetric and pediatric patients. The present study is a clinical audit determining the patients being admitted in our ICU and their clinical outcome so that we can analyze the quality of services provided by us and set a benchmark for future references. Clinical audit plays a vital role in clinical governance and also forms the stepping-stone for quality improvement projects at the heart of which is patient care.⁶ The National Institute for Health and Care Excellence defines clinical audit as quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change.⁷

The outcome of intensive care depends not only on the facilities provided in the unit, the skill and timing with which they are administered, but also on the case mix of problems presented by the surgeons and physicians, who make the initial decisions, which results in their patients requiring intensive care.⁸ Although, it demands a tremendous amount of time and efforts of the medical and nursing staff to treat and improve survival of the critically ill patients, the type and facilities available influences the variety of critical cases that can be handled.^{9,10} Sometimes patients belonging to lower socioeconomic status who could be salvaged if given critical services can't afford the treatment; thereby affecting the outcome.

We had more than 2000 admissions to our ICU in a year which is a fairly good number. Most of the patients, i.e. 42.8% admitted to our ICU were between age group of 46-70 years. In the study by Dheeraj et al 4 too, 41.8% patients were more than 60 years of age. This data is different from other studies where young adults are more commonly admitted in ICU.^{3,10}

In present study, we observed that outcome was found to be significantly associated with age. As the age increased, patient had poorer outcome as compared to young adults. This can be explained by the fact that with old age patient tend to become immuno-compromised and have multiple co-morbidities. On the contrary, study by Gundo et al maximum number of patients who expired were below 40years of age.¹¹ In some studies no association was observed between age and mortality.^{3,10}

The most common source of patients to ICU was from emergency (48.5%) and least number of transfer in was from operation theatre. However, in a study by Koirala et al they had maximum number of patients shifted from emergency operation theatre and 19 % from emergency.⁵ This difference could be explained by the fact that we have separate post-operative ICU in our institute. Only those patients who require hemodynamic monitoring or have multiple co-morbidities requiring intensivists care are sent to main ICU. Unlike many studies our ICU recorded maximum number of patients from General Medicine.^{4,5,9} This was followed by neurosurgery owing to large number of road traffic accidents due to vicinity of hospital to national highway. Moreover, our hospital caters the population of hilly area which happens to be high accident-prone region.

Despite the large number of patients, we could actually shift out nearly half of patients from our ICU in stable condition. The mortality was observed as 28.6 % which is comparable with mortality data of various centers. It is very near to the mortality rates of developed world which is quoted as 18-24%.^{12,13} These data reflect that quality work is being done in our ICU. It is round the clock supervised by the trained intensivists and dedicated and trained staff. We also have round the clock support from hematological, biochemical, radiological departments of

our institute. In a study by Poluyi EO³, mortality was found to be more than 60%. Similarly, in a study from Malawi¹¹, mortality rate was as high as 60.9%. In a study from Srinagar⁴, mortality reported was as low as 9.7%. The reason of such a low mortality could be the fact that around 22.9% patients were referred to higher center while our center is a tertiary care center.

Around 22% patients were those who left against medical advice. This number is pretty high when compared to other studies like by Koirala et al, where it is only 13%.⁵ The most common reason was the poor financial status of our patients. Perhaps our discharge percentage would have been better if we could treat the salvageable patients amongst them. Another important observation from present study was that those patients who were shifted from emergency had significantly better outcome as compared to those who were shifted from ward. This highlights the importance of early and prompt decision of the clinicians who should decide if patient requires intensive care it should be given as early as possible to make utilization of the golden hours.

Limitations of the study

This was a retrospective study. We did not assess the severity of admissions to ICU by various scoring systems. This data would have given us the insight of severity of patients getting admitted to ICU. We should have also taken into account the length of stay of patients. Another finding which we have missed is long term follow up of patients after getting shifted out of ICU. These pitfalls will be addressed in a new prospective study.

CONCLUSION

The medical audit of the largest bedded ICU of Uttarakhand region informs us that most number of patients comprised of medicine and neurosurgical. The best decision about the need for ICU for a patient should be taken as earliest as possible both by the clinician as well as family. Awareness should be made amongst general public about the role of intensive care as most of the people feel that if a patient is admitted to ICU he will never get better. Though the prognosis remains grave but hope should remain alive.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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