



MORTALITY PATTERN IN SURGERY WARDS: A RETROSPECTIVE STUDY IN A TEACHING HOSPITAL

General Surgery

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ABSTRACT

Objective: Hospital mortality rate is a common measure of healthcare quality. Morbidity and mortality meetings are common but there are few reports of hospital-wide mortality-review processes to provide understanding of quality-of-care problems associated with patient death. The aim of this study was to assess mortality in our surgical department and to evaluate the cause of death. **Methods:** We retrospectively collected data of all the patients admitted to the surgical ward in Kanyakumari Government medical college, Asaripallam within one-year period (1st November 2021 to 31st October 2022). Records were collected from ward registers and case notes of all elective or emergency admissions during the study period. **Results:** The total admissions of 10842 patients were observed in surgical ward during the period of 1st of November 2021 and 31st of October 2022. There were a total of 462 deaths during this period (4.2% overall mortality rate). Among this the deaths due to Trauma were (34%), Septicemia (28%), Malignancies (12%), Burns (5%), Post op (8%), GIT related (7%), Other causes (6%). Of the 462 deaths, males were 313 and females were 149. Male to female mortality ratio was found to be 2.1:1. The cause of death in our patients was Trauma, Sepsis, Advanced malignancies etc. **Conclusion:** As per the study the greater number of deaths was mainly due to the unavoidable causes such as Trauma, GIT and Non GIT related sepsis, advanced malignancies, shock, apart from them mainly due to late presentation of sepsis and emergencies cases to admission.

KEYWORDS

Surgical, Mortality, Patients, Complications, Sepsis, Malignancy, Trauma

INTRODUCTION:

Reduction in death rate is the primary responsibility of the treating doctor and timely decision of a surgeon can reduce the death rate of the surgical patients. The audit of mortalities in the surgical patients provide an opportunity to the surgeons, to identify the basic causes of death, in order to modify the ongoing practices and to forestall the events leading to avoidable deaths in surgical wards⁽¹⁻³⁾ It helps in identifying various reasons related to pathogenesis, burden of the disease, role of co morbidities and complications of the operative procedure. It further helps in changing or modifying the surgical strategies, in addition to provide more care where needed identifying the loopholes in surgical practice and to fill the gaps in a specific surgical care.

While Western and European countries have done multiple studies regarding this, and we have noticed that the work done regarding surgical mortality analysis in developing countries is negligible. The objective of this study was to assess the mortality in our surgical ward and the role of audit in changing surgical practice.

The results obtained from this study will help to correct the causes behind avoidable deaths in terms of educating and creating awareness among the surgical professionals to improve the already set standards of quality of care about preventable deaths and to change, modify and strengthen the surgical policies, strategies and practice^(4,5)

METHODS:

A retrospective descriptive observational study undertaken on all the patients admitted from 1 November 2021 to 31 October 2022 to the Department of general Surgical Ward, Kanyakumari Government Medical College, Tamil Nadu, India. The hospital is a tertiary care government teaching hospital.

Data for this study was collected from the medical record room of Kanyakumari Medical College. Records were collected from the ward registers and case notes of all the elective and emergency admissions during this period from 1st November 2021 to 31st October 2022. All Patients admitted in general surgery ward during the study period was required to be an inclusive patient.

A Performa sheet was used to organize the collected data which

included age, sex, diagnosis of patient, events leading to death and clinical cause of death.

Inclusion Criteria:

All Patients admitted in general surgery ward during the study period.

Exclusion Criteria:

The patients who were brought dead were excluded.

RESULTS:

During the period of 1st November 2021 to 31st October 2022, there were total admission of 10842 patients to our Surgical wards including male and female. There was a total of 462 deaths during this period and 4.2% was the overall mortality rate. Out of the 462 deaths, male deaths were 313 and female deaths were 149 and male to female mortality rate was 2.1:1 %. Female mortality was (3.4%) and male mortality rate was (4.8%). Majority of the patients who died were of the seventh decade followed by sixth and eighth decade. The data are tabulated in Table 1.

Table 1: Gender based mortality

Gender	Total Admissions	Mortality	Mortality rate
Male	6482	313	4.8%
Female	4360	149	3.4 %
Total	10842	462	4.2%

Mortality in Seventh decade is more followed by sixth and eighth decade. (Table 2, Figure 1)

Table 2: Age specific mortality rate

Age in years	Number of Deaths	Percentage
1-9	3	0.64%
10-19	7	1.51%
20-29	34	7.35 %
30-39	32	6.92%
40-49	51	11.03%
50-59	98	21.21 %
60-69	129	27.92 %
70-79	85	18.39 %
80-89	18	3.89%
90-99	5	1.08 %
Total	462	100 %



Figure 1: Age specific mortality

Male mortality is more as compared to female mortality with male to female ratio of 2.1:1. (Figure 2)

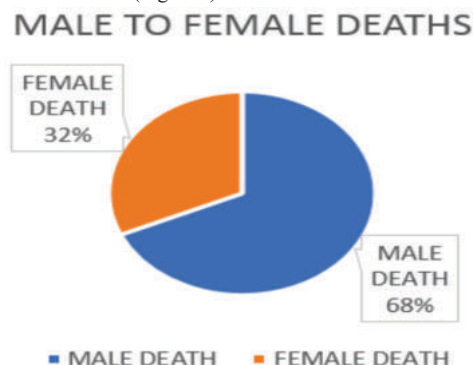


Figure 2: Sex difference in mortality

Among this most common cause of deaths due to Trauma (34%), Septicemia (28%), Malignancies (12%), Burns (5%), Post op (8%), GIT related (7%) and Other causes (6%). The maximum deaths were due to trauma causing shock and hypoxia following head and chest trauma. 28% deaths were due to septicemia following diabetic foot, necrotizing fasciitis, pyelonephritis, abscesses, Fournier's gangrene etc with the diabetic foot being the leading cause of septicemia causing death. 12% of deaths were due to advanced malignancies both of GI and non-GI cancers like carcinoma breast, stomach, pancreas, oral cavity. 7% of deaths were due to GI causes like intestinal obstruction, perforation, pancreatitis etc., 6% of deaths were due to unspecified causes like myocardial infarction, acute coronary syndrome, aspiration pneumonitis, ARDS. (Table 3, Figure 3)

Table 3: Disease related cause of mortality

DISEASE RELATED CAUSES	NUMBER	%
Trauma	157	34%
Septicemia	130	28%
Malignancy	55	12%
Burns	24	5%
Post Op	35	8%
GIT Related	32	7%
Others	29	6%

The most common cause of death is Trauma being 34% followed by sepsis, malignancy etc. (Figure 3)

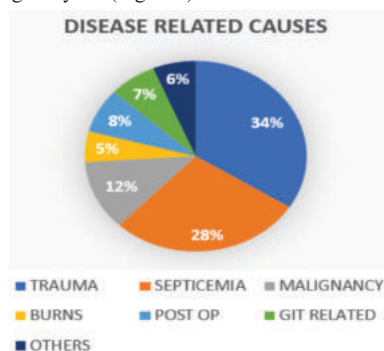


Figure 3: Disease related cause for mortality

Among the trauma related deaths, road traffic accidents were the leading cases of trauma related deaths followed by accidental fall. The deaths were due to hypovolemic shock and hypoxia following head and chest trauma. (Table 4.)

Table 4: Trauma related death cause

Type of Trauma	No of patients	Percentage
Road Traffic accident	103	66%
Accidental Fall	46	29%
Assault	8	5%
Total	157	100%

Post-operative death occurred in 35 patients, constituting 8 percentage of total death. Majority of deaths post-surgery were in emergency surgeries amounting to 83% and elective surgeries being 17% (Table 5, Figure 4). The emergency surgeries performed were for patients presenting with perforation peritonitis, intestinal obstruction, bowel gangrene

Table 5: Type of surgery in post-operative cases

S NO	OPERATED CASES	PERCENTAGE
1	Emergency surgeries	83%
2	Elective surgeries	17%

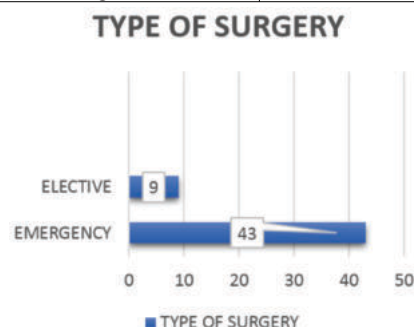


Figure 4 Type of surgery in Post-operative death.

Most of the deaths following malignancy were due to GI malignancies accounting to 56% ranging from carcinoma esophagus, stomach, pancreas, colon, biliary tract. (Table 6, Figure 5)

Table 6: Common Malignancy causing Death

TYPE OF MALIGNANCIES	NO OF CASES	%
GIT Malignancy	31	56%
NON-GIT Malignancy	24	44%

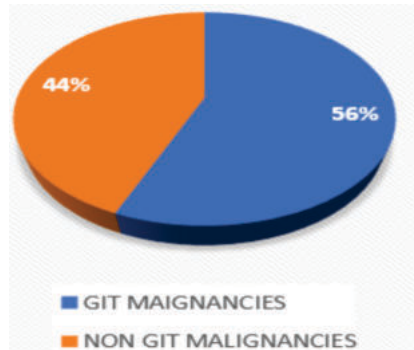


Figure 5: Common Malignancy causing Death

DISCUSSION:

Unlike the deaths occurring other inpatients in any hospitals, death of the patients in relation to surgery are unique and it not only it gives a painful and grievous situation to the family concerned, but also has a treacherous impact on the surgeon and the hospital. Even when the death is not due to the surgical cause⁽⁶⁾, it has high moral and lasting implications on the surgeons, especially when it is due to an avoidable cause. Retrospective analysis and finding out the cause of death would help us gain an insight into the measures that can be applied to reduce mortality and improve the overall outcome.

The whole purpose of carrying out this study was to understand the statistical evidence on the cause of common deaths in the surgical

wards and thereby strategically plan out and implement quality-oriented safety check lists and protocols to reduce such mortality as much as possible. According to Godale et al and Kulkarni SK et al the continuous review and audits of the surgical and the anaesthesia practice leading to surgical mortality will help alleviating the adverse outcome in surgical practice and strengthening the surgical practice and reduce the burden of mortality^(6,7) In the time period from 1st November 2021 to 31st October 2022 the total surgical mortality rate of 4.1% is observed in our study. Hayat WW et al and Ihegihu CC et al, also have stated out the statistics similar to us in their studies 6.2% and 6.4% respectively.^(5,8,9)

Gender specific mortality rate is observed in many other published studies as in ours.⁽¹⁰⁾

Trauma is the leading cause of death with it alone constitute 34% percentage of deaths. It is followed by Septicemia (28%) and Malignant causes (12%). Burns both suicidal and homicidal constitute 5%, deaths. The most significant is the death in Post-operative patients and it occurred in 8% patients. GI related (7%) and other causes of death were 6%. Of the 462 deaths the males were 313 and females were 149⁽¹⁰⁻¹²⁾.

While taking the age specific mortality into consideration seventh decade, sixth and eighth decades showed the maximum rate of mortality with the peak mortality in sixth decade of life. This is because of malignancies and co morbidities which contributes to the deaths. This trend is also observed in many studies as well. The miscellaneous category includes family neglected patients which also contribute to the increasing pattern of mortality.

Trauma was the most common cause of death out of which road traffic accidents were the leading cause. RTA with head injury and chest injury was the leading cause of death. The trauma associated mortality occurs due to shock from blood loss, head injury, and hypoxia from various causes including chest injuries. The lack of effective accident prevention strategies in our social setup, lack of adherence to Road safety rules among public, the uneven roads, nonfunctioning prehospital trauma care all lead to an inordinately high number of trauma victims. And this despite the fact that the typical trauma victim is a young healthy adult male with no co-morbidities. Most often non wearing seat belt, over speed, drunken driving and non-maintenance of vehicle all impact on this vicious cycle.

The most dreaded and avoidable cause of death happens due to the septicemia and either the non-diagnosis at the earlier stages or not proving prompt treatment. Aside from the burn victims, sepsis could not be controlled despite repeated explorations and / or debridement's and culture directed antibiotic therapy. The well - recognized cycle of systemic inflammatory response syndrome leading to multi-organ failure was the final common pathway.

Cancer-associated deaths were more common in the older age groups—not an unexpected finding as cancer incidence generally increases with age. Cancer-associated death was more common in females than males as the commonest cancer-causing mortality in the study was breast cancer, a disease that primarily affects females.

As it is known that emergency procedures are associated with higher mortality, it is not surprising that most of the deaths in the operated group were associated with emergency procedures. Mortality rates for emergency surgical procedures can be reduced by aggressive resuscitative methods, institution of specific prophylaxis, timely surgical intervention, and adequate postoperative care including the ready availability of intensive care when required.

Improving the standards of our health care facilities and personnel would further prevent these deaths. Thompson et al and Anelechi B et al suggested that through continuous and strategic peer review audit will contribute to changes in surgical and anesthetic practice so that the rate of adverse events can be decreased by changing clinical practice^(13,14).

It is mandatory to have the system of positive minded systematic review of all cases succumbed to their diseases in a interdepartmental mortality audit .The findings of the Mortality meet shall be compiled and presented in the core group to analyze the route cause and appropriate remedial measures shall be incorporated into the hospital

protocols. The demographic data of these patients should be analyzed for the identification of any cluster of significant disease or disease of epidemic nature is occurring and prompt public health action shall be initiated. Any deviance noted in the surgical safety check list adherence shall be viewed seriously and man-made errors should be mitigated towards zero error policy.

The national health policies regarding the surgical care and general health care system including the adequate availability of ICU timely availability of investigations for emergency patients, adequate availability of operating theatres, all should be reviewed by the responsible administrative/ government authorities with a representative of a surgical team. Furthermore, the patient literacy level, poverty and provision of health care play directly proportional to each other for which the policies should be made by the government authorities in collaboration with healthcare providers.⁽¹⁵⁻¹⁷⁾

The hospitals can adopt different scores like APACHE score, Glasgow scale, SCAP Score etc. for predicting mortality and giving priority care and advanced treatment to work on the possibility⁽¹⁸⁾.

Limitations of the study:

The documentation errors, retrospective form of study, incomplete details may be considered as limitation of the study, which was tried to be overcome as much as possible.

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