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Research Article

Mortality pattern and trends in surgery wards: a five year retrospective study at a teaching hospital in Hassan district, Karnataka, India

Krishnamurthy V.R., Ishwaraprasad G.D.*, Rajanna B., Samudyatha U.C., Pruthvik B.G.

Department of General Surgery, Hassan Institute of Medical Sciences, Hassan, Karnataka, India

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***Correspondence:**
Dr. Ishwaraprasad G. D.,
E-mail: ishwarprasadgd@gmail.com

ABSTRACT

Background: Information about pattern and cause of death is an important set of health information system, needed for deciding on possible intervention strategies. This study was undertaken with the objective to identify number of deaths in surgical wards for a period of five years and to elicit the causes and pattern of deaths among both operated and non-operated patients.
Methods: A retrospective descriptive study was done on all patients admitted to surgery department of Hassan Institute of Medical Sciences teaching hospital in Hassan District, Karnataka, India from 1st January 2011 to 31st December 2015. Of all the admissions, data of expired patients in detail were extracted. Extracted data included age, gender, surgical diagnosis, co-morbid conditions, procedure performed, events leading to death and the clinical cause of death.
Results: During the study period, there were 8962 admissions in all the surgery wards; of which 5540 were males and 3422 females. There were 585 deaths with an overall death per admission crude mortality rate of 6.5%. The leading causes of death were road traffic accidents with head injury (27.86%) followed by burns (27.17%) and GIT related complications (21.02%). Of the 585 deaths, males were 371 (72.79%) and females 214 (27.21%) in a ratio of 1.73:1.
Conclusions: Over the study period reduction in death rate was observed. This reduction was mainly among preventable causes of death like sepsis, trauma and GIT related causes.

Keywords: In-hospital surgical mortality, Tertiary care, Cause of death, Retrospective study

INTRODUCTION

Death is a part of living but doctors have a responsibility towards reducing the mortality of patients to the maximum extent, especially in the surgical field where the outcomes of mortality are decided sometimes by decisions taken by the surgeon.

By analyzing the mortalities, doctors hope to identify the major reasons for death in surgical wards. So that they can devise strategies to preempt and hence prevent the terminal events leading to the expiry of any given patient.[1,2]

Mortality during surgical care may result directly from the pathologic process necessitating surgical care, as a complication of a surgical procedure and anesthesia, or other co-morbid factors. A study of the mortality pattern can help bridge knowledge gaps in a particular surgical setting and can identify areas of care that require more education, practice modification, and/or policy formulation.[3]

Many researchers have tried to do a systematic review of surgical death. There are many reports of similar work in the west and even from African nations. Studies done by Anelechi B et al, Babatunde A et al from Nigeria, Wasim

H et al and Ozdemir BA et al, have shown mortality rate in the surgical wards as 9.14%, 5.09%, 16.1% and 4.2% respectively.[2-5] However such reports from India are few and far.

The results of the present study will help to improve the quality of care by educating the health care professionals about preventable deaths and to suggest the administration for infrastructure strengthening. The basic aim of any surgical procedure is reduction in morbidity and mortality rates. By comparing the influence on adverse outcome; assessment of the efficiency of surgical procedure and the quality of care provided can be done.[6]

Hence this study was undertaken with the objective to identify the deaths in surgical wards for a period of five years and to elicit the causes and pattern of deaths among both operated and non-operated surgical patients and also to suggest changes that will ensure improved surgical care of patients and better outcome.

METHODS

A retrospective descriptive observational study was done on all patients admitted to the surgery department of HIMS teaching hospital in Hassan District, Karnataka, India. The study period was from 1st January 2011 to 31st December 2015. The hospital is a tertiary referral government teaching hospital. Retrospectively all patients admitted to surgery wards during the 5 year study period were included in the study.

Data for the study was obtained from the case documents from the medical records section. Records were collected from the operation theatre registers and case notes of all patients who were admitted into the surgical wards including elective or emergency admissions. We have excluded the patients who succumbed in emergency room. A minimum of two hours of hospitalization was required to be included in this study.

Out of all the admissions, data of expired patients in detail using proforma sheet have extracted. Extracted data included age, gender, surgical diagnosis, co-morbid conditions, time between onset of symptoms and admissions, procedure performed, events leading to death, dates of death and the clinical cause of death. Case definition of in-hospital surgical mortality which was included in the study was deaths occurring within 30 days of admission for surgical care which has been traditionally used in other studies.[3]

Statistical analysis was done using Microsoft Excel for data entry, Epi Info software for analysis and descriptive statistics to summarize the data.

RESULTS

Between the years 2011 and 2015 there were 8962 admissions to surgical wards. Men admissions was 5540 (61.82%) and women 3422 (38.18%). Among them, 585 deaths occurred in the same period. Of the 585 deaths, 371 were males (63.41%) and 214 were females (36.58%) in a ratio of 1.73:1 (Table 1, 2 and Figure 1).

Table 1: Distribution of year wise mortality rate.

Year	Admissions	Deaths	Mortality rate(%)
2011	1694	148	8.74
2012	1193	133	11.15
2013	2291	114	4.97
2014	1597	106	6.64
2015	2187	84	3.84
Total	8962	585	6.5

Table 2: Gender specific mortality rates.

Year	Admissions	Males admissions	Male death	Gender specific death rate (males)	Females admissions	Female death	Gender specific death rate (females)	Deaths	Mortality rate (%)
2011	1694	959	92	9.59	735	56	7.62	148	8.74
2012	1193	763	90	11.79	430	43	10	133	11.15
2013	2291	1516	79	5.21	775	35	4.52	114	4.97
2014	1597	1032	68	6.59	565	38	6.73	106	6.64
2015	2187	1270	42	3.31	917	42	4.59	84	3.84
Total	8962	5540	371	6.7	3422	214	6.25	585	6.5

The gender specific death rate was 6.70% (371 out of 5540) and 6.25% (214 out of 3422) for men and women respectively. Table 3 shows the age distribution as well as the number of deaths in each gender. Majority of these 373 (63.76%) mortalities were among the individuals who were below 50 years of age. The study shows a

progressive decreasing mortality trend from 2011 to 2015 from 25.29% to 14.35% i.e., a reduction of 10.94% in absolute figures (43.2% reduction in relative figures) (Table 4). It also shows that reduction in mortality among men is 13.47% and among women is 6.54% (absolute figures). The most common cause being RTA with head injury (27.86%) followed by burns (27.17%) and GIT related complications (21.02%) (Table 5).

Table 3: Proportional mortality rate by age during the period 2011-2015.

Distribution of death (according to age in years)	Number of death during the period 2011- 2015			
	Female	Male	Total	Percentage
1-10	2	4	6	01.02
11-20	16	14	30	05.12
21-30	57	55	112	19.15
31-40	35	73	108	18.46
41-50	33	84	117	20.00
51-60	16	58	74	08.03
61-70	46	53	99	16.92
71-80	8	17	25	04.27
81-90	1	13	14	02.39
Total	214	371	585	100

Table 4: Year-wise distribution of causes of death among patients admitted to surgical wards during the period 2011-2015.

Gender	Year	Cause of death during the period 2011-2015						Total
		GIT related*	RTA with head injury	RTA chest/ polytrauma	Malignancy	Burns	Non GIT septicemia and others[#]	
Female	2011	9	12	3	5	21	6	56
	2012	7	3	0	2	24	7	43
	2013	2	5	1	1	22	4	35
	2014	6	7	0	3	14	8	38
	2015	0	12	0	2	24	4	42
	Total	24	39	4	13	105	29	214
Male	2011	26	26	9	2	11	18	92
	2012	24	28	14	4	9	11	90
	2013	28	28	4	2	12	5	79
	2014	9	30	2	1	12	14	68
	2015	12	12	0	2	10	6	42
	Total	99	124	29	11	54	54	371
Both male and female	2011	35	38	12	7	32	24	148
	2012	31	31	14	6	33	18	133
	2013	30	33	5	3	34	9	114
	2014	15	37	2	4	26	22	106
	2015	12	24	0	4	34	10	84
	Total	123	163	33	24	159	83	585

Table 5: Surgical diagnosis/cause of death.

Surgical diagnosis/Cause of death	Frequency	Percentage (%)
GIT related- perforated peritonitis, upper GI bleed	123	21.02
RTA with head injury	163	27.86
RTA c chest/ Polytrauma	33	05.64
Malignancy	24	04.10
Burns	159	27.17
Non GIT Septicemia- DM and others	83	14.18
Total	585	100

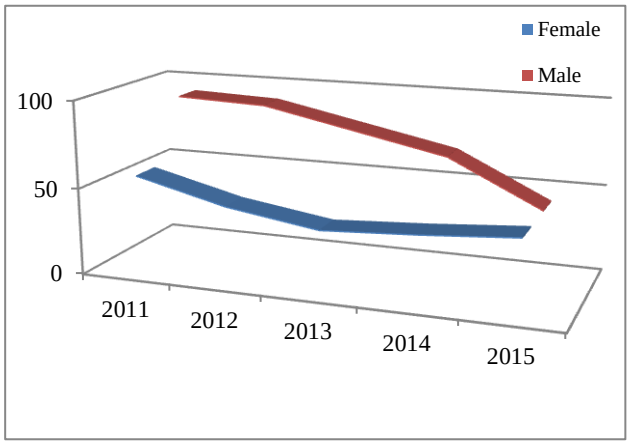

Figure 1: Gender and year wise distribution of deaths.

DISCUSSION

Death in hospital often has disastrous consequences and reflects the quality of surgical services. It draws attention from the public, media and administration. Also it adds to the occupational stress among surgeons. Many a time surgical deaths occur when it is least expected unlike medical wards.

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. Records of vital events like death constitute an important component of the health information system.[7]

The district hospital attached to the institution was only a service hospital prior to 2006. The first batch of interns was added to provide service in 2011. From 2011 through 2015 there is a zigzag trend in number of patients admitted to the hospital. Among them surgical mortality rate of 6.5%. This observation in present study compares reasonably with many studies from authors Anelechi B et al, Wasim Hayat et al, Ihegihu CC et al, Ekeke ON et al 9.14%, 6.2%, 8.3% 6.4% respectively.[2,4,9,10]

There is a steady decrease in absolute number of deaths. However there is varying trend in the crude death rates; though there is a general declining trend in the death rate as well. Many studies worldwide have shown a similar decrease in the death rates among surgical ward patients.[4]

Men were almost double the number of women among the dead (63% v/s 37%). Many authors have found preponderance of male deaths over female deaths similar to our study.[2,4,8,7] Traditionally men make up two thirds of the surgical patients compared to women. The death rate is almost same as the admission rate (62% v/s 38%). Over the study period both gender showed reduction in deaths. However reduction in death is almost twice among men compared to women. This reduction is mainly among preventable causes like sepsis, trauma and GIT related causes, which were the leading causes of death in men.

Majority of deaths were noted in the 3rd, 4th and 5th decade of life with the peak occurring at 5th decade. This observation is similar to majority of the studies.[2-4] Death in this productive age group adds to the burden of the family and society. It is observed that surgical deaths peak a decade or two earlier than medical deaths.[7] Another peak noted in 7th decade when malignancy and co morbid conditions contribute to the death. Neglect by the family may also contribute to the increased mortality in this group.[7] Deaths among women occur more frequently in 2nd and 3rd decade with a second peak in 7th decade similar to men.

More than half of the deaths (314 out of 585=54%) were due to trauma as a broad category. This included burns and non-burn trauma contributing almost equally. RTA with head injury and chest injury was the leading cause of death among men, while burn was the predominant cause of death among women. As the burn injuries are due to marital discord and domestic problems, they were more common among women at late 2nd and 3rd decade, whereas RTA was more common among men found mostly in the actively mobile group of 3rd, 4th and 5th decade.

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 peer review audit will contribute to changes in surgical and anaesthetic practice so that the rate of adverse events can be decreased by changing clinical practice.[4,11]

Mortality due to burns should encourage the administration to establish specialized burn units under the care of a dedicated plastic and burn surgeon. It is also time to establish full pledged trauma care unit with neurosurgeon included. Both are currently in the focus of National health policy of Govt. of India.[12,13]

Further there is need for regular audit of deaths and problems of documentations should be addressed. The death notes should be revised and develops a user-friendly computer based data. This should include details of age, gender, place of residence, surgical diagnosis, co-morbid conditions, time between onset of symptoms and admissions, procedure performed, events leading to death, dates of death and the clinical cause of death.

Limitation of the study could be it's a retrospective study; admission to death ratio may not be the exact number because of error in documentation etc. Few of the case sheets we could not get complete details.

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