MORTALITY REVIEW IN THE UNIVERSITY DEPARTMENT OF SURGERY, SINGAPORE GENERAL HOSPITAL: JANUARY — DECEMBER, 1981

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SYNOPSIS

A study of the mortality pattern in the University Department of Surgery, Singapore General Hospital, was conducted for the period January to December, 1981.

A total 169 deaths which formed 2.2% of all admissions occurred during this time, 54% of these deaths occurred between the ages 60-79 years. The autopsy rate was 13.6%.

Four broad groups were identified in this study: deaths due to Accident/Trauma, Cancer deaths, operative deaths and a group of deaths due to miscellaneous causes. Cancer deaths formed the largest group, accounting for 56.2% of all deaths in this series. The emphasis of this study was on the analysis of the group of operative deaths forming 36.7% of the series, with a velew to identifying any potentially avoidable factors.

INTRODUCTION

This paper presents a retrospective review of mortality in the University Department of Surgery, Singapore General Hospital, for the period January to December 1981. The aim was to study the mortality pattern in a General Surgical Unit and specifically to identify the avoidable risk factors in operative mortality.

MATERIALS AND METHODS

Singapore General Hospital is the largest hospital in Singapore with a total of 1593 beds. The University Department of Surgery is one of the two General Surgical Units in the Hospital. It has 166 surgical beds of which 19 are reserved for High Dependency care patients.

In 1981, there were 7564 admissions to Unit of which 3463 were elective and 4101 were emergency admissions. (1) A review of the operating room log indicated that for the same period, there were 5167 operative procedures performed of which 3574 were elective and 1593 were emergency procedures. The total number of deaths for the period was 169. (2) This gave an overall mortality rate of 2.2% (Table I).

TABLE 1
CLINICAL MATERIAL

Period under Study: Jan — Dec 1981

TOTAL ADMISSIONS

7564 — Elective 3463
— Emergency 4101

TOTAL DEATHS

169

MORTALITY DATE

2.2%

All the deaths in the Unit were discussed at the weekly Mortality conference held every Saturday in the Department. Each case was reviewed and discussed by Surgical staff, with reference made to post-mortem reports whenever available. The data so derived from these mortality records were compiled and analysed.

RESULTS AND DISCUSSION

Most of te deaths occurred in patients above 50 years of age with 54% in the 60-70 year age group (Figure 1). These deaths were classified as due to accident and trauma, malignancies, operative and miscellaneous causes. (Table II)

TABLE II
CASES OF DEATH

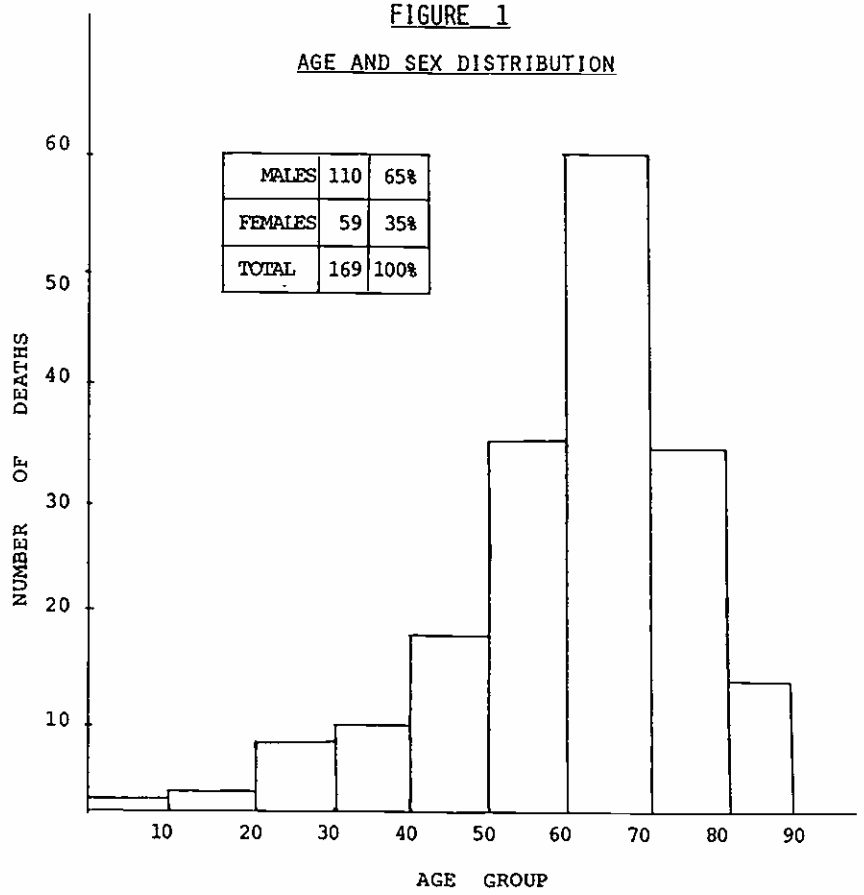
Accident/ Trauma	19 (11.2%)	No operation	7
		Operation	12
Operative	24 (14.2%)		62
Malignancies	95 (56.2%)	Operation	26
		No operation	69
Miscellaneous	31 (18.4%)		
Total	169 (100%)		

Accident and trauma accounted for 11.2% of all deaths. Most of the patients were males. 15 cases were due to falls from heights. Of these, 13 died of unsalvageable head injuries, 5 from multiple injuries, and 1 from a cerebrovascular accident.

Malignancies accounted for 56.2% of deaths in the series. The most common malignant deaths in the Department included Carcinoma of the stomach, colon, esophagus and breast in that order. These patients suffered from advanced malignancy being admitted mainly for palliative surgical procedures or for terminal care.

FIGURE 1

AGE AND SEX DISTRIBUTION



Operative mortality was defined as any deaths occurring within 30 days of a major surgical procedure. The mortality rate for elective major procedures was 0.13% and for emergency major procedures was 6.1% with and overall operative mortality of 2.4%. (Table III)

TABLE III
OPERATIVE STATISTICS

Figures for 1981	Elective	Emergency	Total
Total no. of operating	3574	1593	5167
Total no. of major operations (Table 3 and above)	1576	984	2560 above)
Operative deaths	2	60	62
Mortality rate* (%)	0.13	6.1	2.4

Of the 62 operative deaths in the series, 12 were emergency procedures performed for Accident/ Trauma, 26 were palliative procedures performed for malignancy, and the remaining 24 operative deaths were further analysed according to the operative site. (Table IV) Deaths following emergency surgery for Accidents/Trauma and palliative surgery for malignancies were largely classified as expected. However, there were 3 avoidable deaths in the Operative group, 2 due to technical errors and 1 due to an anaesthetic complication.

TABLE IV
OPERATIVE DEATHS

Operative Deaths	Emergency	Elective
Accident/Trauma	12	—
Palliative Surgery for Carcinoma	26	—
Operative Deaths		
Biliary	22	2
Upper GIT	8	1
Genitourinary	6	
Lower GIT	2	1

The first avoidable death was that of a 71 year old chinese male who presented with massive upper Gastrointestinal hemorrhage from a bleeding duodenal ulcer. An emergency gastrectomy was performed but the patient died on the second postoperative day from pulmonary oedema probably as a result of overtransfusion in the intraoperative and immediate postoperative period.

The second case was that of a 92 year old chinese female who had undergone a hemicolectomy for carcinoma of the colon previously, and presented to us with a perforated duodenal ulcer some years later. However, the patients died on the 8th postoperative day from septicemia as a result of undetected iatrogenic perforation of the ileum from the dissection of adhesions during the operation.

The third case was that of a 65 year old chinese female who presented with cholangitis and underwent an emergency choledocho duodenostomy. A leak developed in the anastomosis which was repaired, but the patient then died 8 days later from septicema.

There were 2 deaths occurring as a result of elective surgery. In both instances, the cause of death was acute myocardial infarction occurring at the end of the first week following otherwise uneventful surgery on the biliary tract and colon respectively.

Besides the 3 avoidable deaths, and the 2 deaths following elective surgery, the remainder of the operative deaths occurred in elderly patients with pre-existing medical illnesses who succumbed mainly from cardiopulmonary complications and sepsis.

Miscellaneous deaths comprised 18.4% of the series. These included patients undergoing conservative therapy, investigations, awaiting surgery and those who had refused surgery. The causes of death in this group are listed in Table 5.

TABLE V
DEATHS DUE TO MISCELLANEOUS CAUSES

Causes of Death	Number
Acute Myocardial Infarction	7
Liver Failure	5
Bronchopneumonia	3
Bleeding GIT	3
Septicaemia	3
Cerebrovascular Accident	2
Chronic Renal Failure	2
Pancreatitis	2
Congestive Cardiac Failure	2
Chronic Obstructive Lung Disease	1
Multiple Systemic Emboli	1
Total	31

The Post-mortem rate analysed for the same period of time in the Department was only 13.6% (Table 6). These were mainly conducted for the accident and trauma deaths for medico-legal reasons.

TABLE VI
POST-MORTEM RATES

Causes of Death	No. of Deaths	No. of Post-Mortem	Post Mortem Rate (%)
Accident/ Trauma	19	15	78.9
Operative	24	2	8.3
Cancers	95	1	1.1
Miscellaneous	31	5	16.1
Total	169	23	13.6%

The post-mortem rate for the operative group of deaths was extremely low. This was because of the difficulty in obtaining consent from the next of kin due to cultural or religious objections among the local population. This attitude has hindered us from the accurate documentation of the exact cause of death in many instances. Interestingly, this low post-mortem rate was similarily reflected in the mortality reviews

conducted by the Medical Unit at the Singapore General Hospital for the periods 1972-1973 and 1974-1975. (3, 4)

CONCLUSION

Though the overall mortality in the Unit for the period January to December 1981 was acceptably low at 2.2%, further improvement could be achieved by careful surgical technique and better supportive care. A concerted effort should be made by the doctors concerned to improve the post-mortem rate thereby allowing more accurate surgical auditing.

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