

POST MORTEM STUDY OF POSTSURGICAL MORTALITY IN SECUNDERABAD CITY

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ABSTRACT: BACKGROUND: Surgery is an essential part of present medical practice and it is one of the important tools of curing many diseases. Surgery is done in elective cases after the diagnosis is promptly made before operating, and in emergency surgeries an empirical diagnosis is made and after opening moderation is adopted in the procedure. In spite of all safety precautions adopted, death may result in some cases. Then a question arises about the competency and efficiency of the surgeon, investigations, interpretation about the diagnosis of the disease and the management of the case. To answer these questions we need to do a Pathological (Clinical) autopsy than a medico-legal autopsy. The scope of the present study was only to find which of the surgeries resulted in most of the fatal outcomes and try to determine the underlying causes it has its own limitations. Deciding about the occurrence of Medical Negligence and fixation of responsibility is beyond the scope of this study. **AIMS:** To know the incidence of surgical postoperative deaths of Gandhi Hospital, Secunderabad [A.P], during year 2006. **RESULTS:** The incidence of surgical death in this group of population is about 1.5%. Most number of cases involved was males and belongs to 22-45 year age group. 75% of deaths occurred in Males of this group as compared to females who were 25% of the total study population, however it was not statistically significant. 86.6% of the surgeries with fatal outcome were done in emergency conditions and rest was done on elective basis. Study also shows that the main anatomical locations involved are the head and neck region 48.3% which resulted in most number of postsurgical mortality. **CONCLUSIONS:** The frequency of death occurring after emergency surgeries is more than that of elective surgeries probably indicating that in emergency surgeries there was some hastiness in selecting the cases for surgery, presence of co - morbid conditions and lack of complete investigations due to time constraints could be among the factors or the cases were in critical condition before surgery.

KEYWORDS: Post Mortem, Postsurgical Mortality.

INTRODUCTION: Death is impending in all life threatening conditions. Man has discovered many methods at least to postpone death or to reduce suffering of the disease. These include mainly the medical and surgical treatment modalities.

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Surgery is an essential part of present medical practice and it is one of the important tools of curing many diseases. Surgery is done in elective cases after the diagnosis is promptly made before operating, and in emergency surgeries an empirical diagnosis is made and after opening, moderation is adopted in the procedure. In spite of all safety precautions adopted, death may result in some cases.

The American Association for Accreditation of Ambulatory Surgery Facilities (AAAASF) has reported statistics on morbidity and mortality for facilities that it accredits based on an analysis of unanticipated sequelae and surgical mortality. Data acquired through the first Internet-Based Quality Assurance and Peer Review reporting system (IBQAP) were reviewed by Keyes GR *et al* and published in 2004 [1]. In this review of data collected using the IBQAP from January of 2001 through June of 2006, there were 23 deaths in 1,141,418 outpatient procedures performed. Pulmonary embolism caused 13 of the 23 deaths. Only one death occurred as the result of an intra-operative adverse event. By this it is known that a pulmonary embolism may occur after any operative procedure, whether it is performed in a hospital, an ambulatory surgery centre, or a physician's office-based surgery facility.

Cardiac surgeries always have lot of risk, not only by the procedures but also by the disease itself. Death may not be prevented even after taking any number of precautions. The retrospective study made by Tully PJ *et al* [2] examined the association between symptoms of depression, anxiety, and mortality risk following coronary artery bypass graft (CABG) surgery. There were 67 (15%) deaths overall during the follow-up period. Adjusted survival analysis showed that preoperative depressive symptoms were not associated with a significantly higher risk of mortality. Survival analysis with preoperative anxiety adjusted for covariates showed a significantly increased mortality risk.

Surgical resection for the treatment of oesophageal cancer remains a high risk procedure. To develop a model to predict risk of postoperative death, Ra J *et al* [3] sought to identify factors associated with postoperative mortality for Medicare patients undergoing Oesophagectomy for cancer. A total of 1172 patients underwent oesophageal cancer surgery during this study period. Overall postoperative mortality was 14%.

Laparoscopic adjustable gastric banding (LAGB) is first of the most used surgical procedures to treat obesity, with > 120,000 bands positioned around the world. Data from 9,682 patients were collected by Gagner M *et al*, [4] from 24 articles and 48 (0.51%) deaths were reported.

Patients with small bowel injuries (SBI) in abdominal trauma have no clear clinical or radiological signs on initial examination. This leads to delay in appropriate surgical interventions with consequent high morbidity and mortality. Sitnikov V *et al* [5] found that, diagnostic video laparoscopy was sufficient for 518 (63.2%) patients. Ninety-seven (11.8%) patients with small bowel injury were associated with postoperative complications. There were 19 (2.3%) deaths associated with hemoperitoneum, severe head injury, and multiple ribs fracture. Generalized peritonitis was revealed in one case and focal abscesses between intestinal loops were identified in another one patient.

Over the past 25 years, 43 peripartum hysterectomies were performed at the Rahman J *et al* College of Medicine, King Faisal University, Dammam, Saudi Arabia, an incidence of 0.64/1,000 deliveries; 31 procedures followed caesarean section and 12 were performed for haemorrhage

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following vaginal delivery. Five (11.6%) maternal deaths occurred in the series. Mortality was associated with massive haemorrhage. With rising caesarean section rates worldwide, MRI and colour Doppler sonography is useful to diagnose antepartum placenta accrete/bladder involvement in order to plan elective surgery that is associated with reduced maternal morbidity and mortality [6].

Orthopaedic surgeries are also not exceptions for having fatal outcomes. The ideal timing of spinal fixation is controversial. A recent study showed that early spine fixation reduced morbidity and resource utilization. Kerwin AJ *et al* [7] previously noted a trend toward higher mortality in patients undergoing early spinal fixation. Three hundred sixty-one patients between January 1988 and February 2003 required operative spinal fixation (158 early, within 48 hours vs. 203 late, beyond 48 hours). There was no significant difference between the two groups except mortality, which was significantly higher in the early group (7.6 vs. 2.5%; $p = 0.0257$).

AIMS: There were several deaths which occurred in the post operative periods. The present study is mainly aimed to make critical analysis of those deaths, where surgical intervention was made the individual died post operatively in Gandhi Hospital Secunderabad during the year 2006.

To know the incidence of surgical post-operative deaths of Gandhi Hospital, Secunderabad during year 2006.

To know how many Emergency Surgeries and Elective Surgeries resulted in fatal outcomes in this group of population.

To know whether the postmortem examination findings made were different from the ante mortem diagnosis in these cases.

MATERIALS AND METHODS: The present cohort study is made on the data available from the Department of Forensic Medicine, Gandhi Medical College, Secunderabad, Andhra Pradesh, during the year 2006. The deaths occurred in Gandhi Hospital and Private Hospitals in the city. For the analysis the following documents are utilized:

1. The Post mortem examination of deaths occurred within 15 days of the postoperative period of the cases which had undergone surgery.
2. Hospital records about the investigations and treatment particulars
3. Personal enquiry with the attendants regarding previous illness and medical records in available cases
4. The Inquest reports
5. Other investigation made during the postmortem examination

ETHICAL CLEARANCE: The research protocol was reviewed and approved by the ethical committee of Gandhi Medical College and Hospital Secunderabad A.P.

STATISTICAL ANALYSIS: Collected data was entered in the Microsoft Word Excel Sheet 2007 version and the data obtained was analyzed using the SPSS (Statistical Package for the Social Sciences) 17 Version.

RESULTS: There were 3997 Post Mortems were done in Gandhi Medical College Hospital Secunderabad in 2006. About 60 cases of post-surgical deaths were reported during this period. The incidence of surgical death in this group of population is about 1.5%. These deaths included

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surgeries which are conducted on emergency and elective basis, both in trauma as well as pathological conditions.

TABLE NO. 1 Age and sex distribution

	Infants	Children	Adolescents	Adults	Middle aged	Elderly	Total	P value
	< 1 yr	1 - 12 years	13 to 21 years	22 to 45 years	46 to 60 years	>61 years		
Male	1	5	8	25	6	-	45	0.83798
Female	-	2	4	6	3	-	15	
Total	1	7	12	31	9	0	60	

There are 45 cases of Male and 15 cases of female present in this study, from different age groups (Table No. 1). Most number of cases involved was males and belongs to 22-45 year age group, perhaps indicating vulnerability of this group to Road Traffic Accidents. Although males are 75% of this group as compared to females who were 25% of the total study population, but the resulting p value by chi square test shows a value of 0.83798 ($P > 0.05$) hence it is not significant

TABLE NO. 2 Distribution of cases

	Male	Female	Total	P value
Trauma Emergency Cases	33	10	43	0.399203
Trauma Elective Cases	4	1	5	
Pathology Emergency	5	4	9	
Pathology Elective	3	0	3	
Total	45	15	60	

Emergency surgeries conducted on trauma cases scored 43 lives (Table No.2) Elective Surgeries in trauma had taken 5 lives. While surgeries that were done in emergency pathological conditions have taken 9 lives as compared to surgeries done in elective pathological conditions, which had taken 3 lives, however the 'p' value obtained is 0.399203 (> 0.05) and not significant.

TABLE NO. 3: Type of surgery performed and Anatomical Locations

	Emergency	Elective	Total	P value
Head	28	0	28	0.125928
Neck	1	0	1	
Chest	4	2	6	
Abdomen	14	2	16	
Pelvis	5	1	6	
Limbs U/L	0	3	3	
Total	52	8	60	

Table No.3 shows that 86.6% of the surgeries with fatal outcome were done in emergency conditions and rest was done on elective basis. Also shown is the main anatomical locations involved are the head and neck region 48.3%. It is due to the anatomical location of the areas and vulnerability of these sites for accidents. Also the abdominal areas with emergency conditions recorded 23.3% fatal outcomes. The 'p' value calculated is greater than 0.05 (0.125928) hence not significant for emergency surgery in this group of population.

DISCUSSION: The scope of the present study is only to find common causes of surgical deaths in this sample of population, however it must be remembered that this data may not be accurate since many post operative death cases are not registered as medico legal cases and may have been missed from this study. Deciding about the occurrence of Medical Negligence and fixation of responsibility was beyond the scope of this study.

Among the emergency surgeries done on head injuries, the leading number of deaths occurred in adults and adolescent. One study conducted by Gennarelli, Thomas *et al*; [8] showed relative to the incidence, patients with head injury composed of high percentage of all deaths. This was due to high mortality rate for head-injured patients. Overall mortality of patients with head injury (18.2%) in his study and was three times higher than if no head injury occurred (6.1%). Because of its high mortality, head injury is the single largest contributor to trauma center deaths. This is in agreement with our findings.

Another similar prospective study by Melville R. Klauber *et al*; [9] showed that the overall incidence of head injury was nearly 0.3%; the highest rate was seen at ages 10–29 years which is in agreement with our findings. At all ages, head injury rates were higher in males than in females, and the death rate in males was 2.6 times more than that in females. Similar findings were present in our study which shows that 23/28 (82.14%) head injuries occur in males with fatal outcome. The overall case fatality ratio was 7.5%, and 65% of all deaths occurred prior to hospitalization.

Abdominal injuries subjected to surgery had led to loss of 9 lives and was standing next to head injuries. There was one emergency surgery done on the cervical spine fracture which occurred after fall in this study. Chest injuries after emergency surgery had accounted for four lives. One isolated pelvic trauma case had died after emergency surgery. A similar study conducted by Hoyt, David *et al*; [10] for death in Operating Room they found out injury patterns as the leading cause of

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death included head/neck injury 16.4%, chest injury 27.4%, and abdominal injury 53.4% actual cause of death was bleeding in 82%, cerebral herniation 14.5% and air emboli 2.2%.

Among the elective surgeries conducted in our study, in trauma cases a total of five patients lost their lives. Septicemia after surgery on lower limb injuries tolled two lives. One laparotomy done on elective basis after trauma on abdomen had resulted in one death. Another death had occurred after elective surgery on chest, who sustained injury during an accident.

TABLE NO. 4. Injuries found in Post mortem examination of trauma cases operated on emergency

	Skin/Scalp	Soft tissue	Fractures of bones	Vital Viscera	Other
Head injuries	25	5	20	28	-
Neck injury	0	1	1	1	-
Chest injury	2	2	4	4	-
Abdominal Injury	4	9	13	9	1
Pelvic injury	1	1	1	1	1

In 9 cases emergency surgeries were planned in pathological conditions (Table No.4) as 2 in acute intestinal obstructions, three caesarean sections and one ruptured ectopic pregnancy. In three more cases of acute abdomen, emergency surgery was planned and after opening there were multiple adhesions seen, which were made by the previous surgeries.

Three elective surgeries on different pathological conditions also resulted in death in the post operative period. One case was CABG, another congenital hernia repair and the last one was sub-acute intestinal obstruction.

Of the five traumas related cases which were posted on elective basis, of which 2 cases were amputation for lower limb injuries, had died within three days of surgery. One chest injury case with pneumothorax, for which inter costal drain was put, had died on the day of procedure within 12 hours. An elderly female patient had comminuted fracture of neck of femur, died after four days of surgery. Another elderly male patient who had blunt injury of abdomen, underwent explorative laparotomy after three days of injury died on the day of procedure within 12 hours of surgery.

One ruptured ectopic pregnancy case died within 12 hours of surgery. Two caesarean section cases had died with 12 to 24 hours of surgery. Another caesarean section case survived for two days and later died. One male adolescent after surgery for intestinal obstruction had survived for two days and died. Three cases of exploratory laparotomy resulted in one death within 24 hours; second one on the second day and third one on the fifth postoperative days respectively.

One case of CABG had died on first postoperative day, one case of congenital hernia repair and blunt injury of abdomen died on second day of surgery.

Although in most cases the autopsy findings were very well correlated with antemortem diagnosis, observations made in these cases were insufficient to come to conclusion because of several factors. Sometimes the case sheets were incompletely filled about the clinical findings, the

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investigation reports in some cases were not yet received by the time of death. Yet in other cases due to various surgical procedures like amputations, hysterectomies, resections, etc the organs are not present at the time of post mortem examinations which in itself is a limitation to the Post Mortem diagnosis of the conditions which might have been prevalent in antemortem period.

CONCLUSIONS: Within the limitations of our study, it is concluded that Deaths were frequently occurring in the postoperative period of surgeries done on trauma cases on emergency basis than elective basis. However it is seen that, deaths after head injuries were frequent than injuries on other parts of the body, indicating that, injuries on head were fatal than injuries on the other parts of the body. Frequency of deaths occurring after emergency surgeries in pathological cases was also more than surgeries done in elective pathological conditions. This indicates in emergency surgeries there was some hastiness in selecting the cases for surgery, presence of co-morbid conditions and lack of complete investigations due to time constraints could be among the factors or the cases were in critical condition before surgery.

REFERENCES:

1. Keyes GR, Singer R, Iverson RE, McGuire M, Yates J, Gold A, Reed L, Pollack H, Thompson D – ‘Mortality in outpatient surgery’ - *Plast Reconstr Surg*. 2008 Jul;122(1):245-50.
2. Tully PJ, Baker RA, Knight JL. – ‘Anxiety and depression as risk factors for mortality after coronary artery bypass surgery’ - *J Psychosom Res*. 2008 Mar;64(3):285-90
3. Ra J, Paulson EC, Kucharczuk J, Armstrong K, Wirtalla C, Rapaport- Kelz R, Kaiser LR, Spitz FR – ‘Postoperative mortality after esophagectomy for cancer: development of a preoperative risk prediction model’ - *Ann Surg Oncol*. 2008 Jun;15(6):1577-84
4. Gagner M, Milone L, Yung E, Broseus A, Gumbs AA – ‘Causes of early mortality after laparoscopic adjustable gastric banding’ - *J Am Coll Surg*. 2008 Apr;206(4):664-9
5. Sitnikov V, Yakubu A, Sarkisyan V, Turbin M – ‘The role of video-assisted laparoscopy in management of patients with small bowel injuries in abdominal trauma’ - *Surg Endosc*. 2008 Apr 10.
6. Rahman, J Al-Ali M, Qutub HO, Al-Suleiman SS, Al-Jama FE, Rahman MS ‘Emergency obstetric hysterectomy in a university hospital: A 25-year review’- *J Obstet Gynaecol*. 2008 Jan; 28(1):69-72.
7. Kerwin AJ, Frykberg ER, Schinco MA, Griffen MM, Arce CA, Nguyen TQ, Tepas JJ 3rd – ‘The effect of early surgical treatment of traumatic spine injuries on patient mortality’ - *J Trauma*. 2007 Dec;63(6):1308-13.
8. Gennarelli, Thomas A, Champion, Howard R, Sacco, William J., Copes, Mortality of patients with Head injury and Extracranial Injury treated in Trauma Centers’ *Journal Of Trauma-Injury Infection & Critical Care*: 29(9):1193-1202, September 1989.
9. Melville R. Klauber, Elizabeth Barrett-Connor, Lawrence F. Marshall And Sharon A. Bowers The Epidemiology of Head Injury ‘A Prospective Study of An Entire Community’—San Diego County, California, 1978 *American Journal Of Epidemiology*, Volume 113, Issue 5 Pp. 500-509.
10. Hoyt, David B; Bulger Eileen, Knudson Margret, John Morris et al ‘Death in the Operating Room: An Analysis of a Multi-Center Experience’, *Journal of Trauma-Injury Infection & Critical Care*: September 1994 - Volume 37 - Issue 3 - pp 426-432

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CHART NO. 1 Age and sex distribution

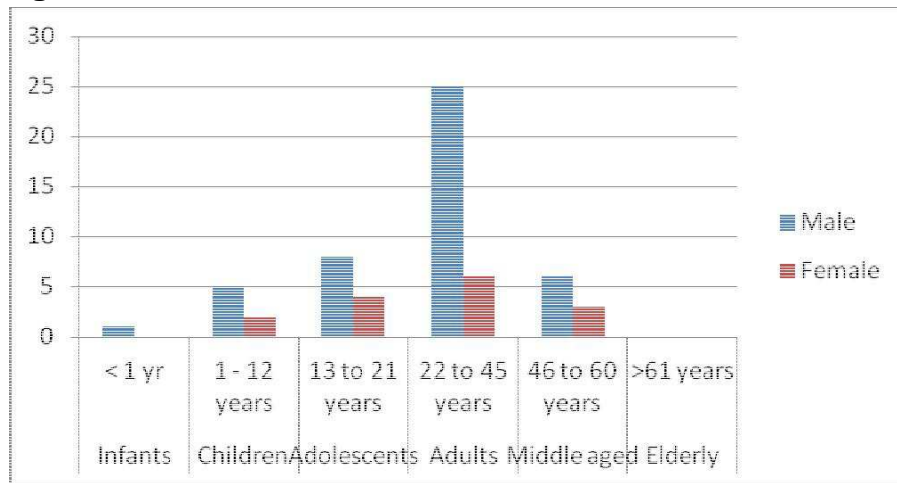


CHART NO. 2 Distribution of cases

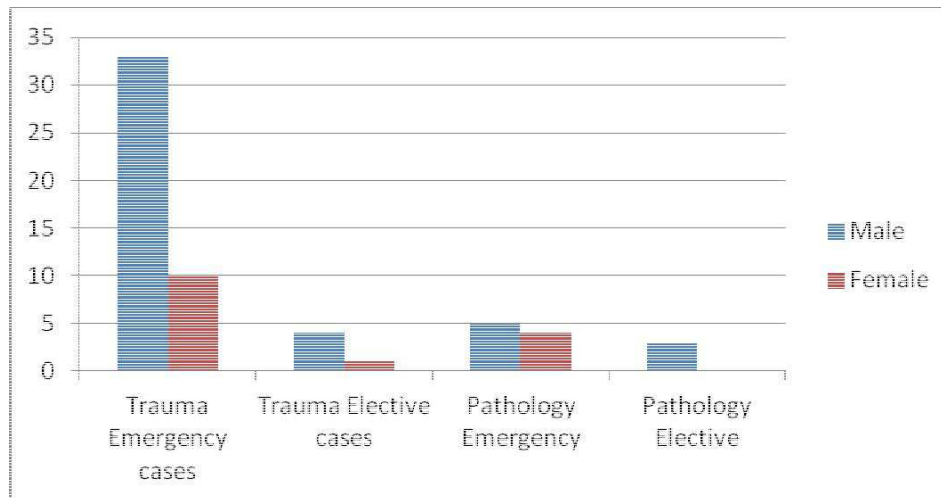


CHART 3: Type of surgery performed and Anatomical Locations

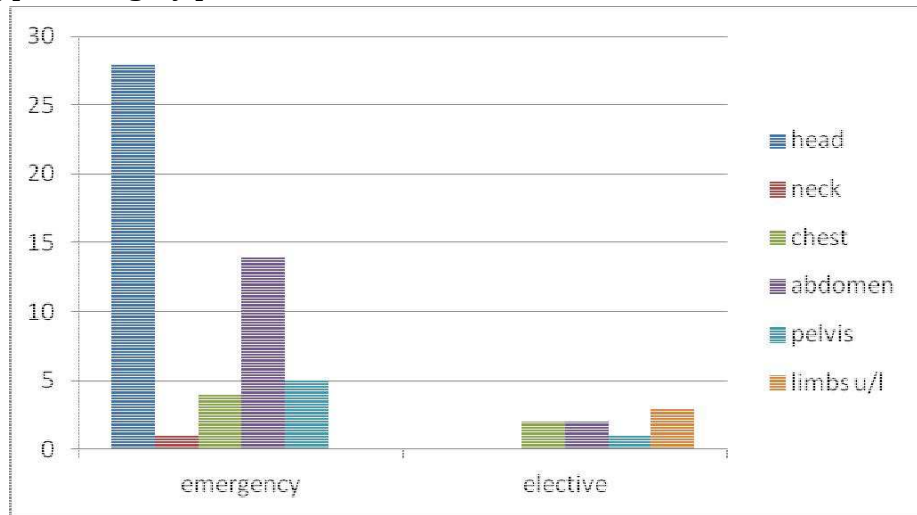


CHART NO. 4. Injuries found in Post mortem examination of trauma cases operated on emergency

