Original Article

ASSESSING THE MORTALITY RATE OF PATIENTS IN A MAXILLOFACIAL SURGICAL UNIT

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ABSTRACT

Objectives: *To assess the mortality rate amongst all the patients undergoing maxillofacial surgical procedures under general anesthesia or were admitted at the time in the Department of Oral and Maxillofacial Surgery at Khyber College of Dentistry, Peshawar.*

Materials and Methods: *This retrospective study was carried out at the Department of Oral and Maxillofacial Surgery at Khyber College of Dentistry, Peshawar. The patient records from January 2009 to December 2012 were reviewed and only those cases were included in the study that had undergone surgical procedures under general anesthesia or were admitted in the unit and were receiving preoperative care at the unit till the time of their demise.*

Results: *A total of 3277 patients were admitted to the Oral and Maxillofacial Surgical Unit for undergoing procedures under general anesthesia. Out of those 3277 patients, 7 patients expired. Of the 7 patients, 2 died postoperatively and 5 patients died in the preoperative period. The preoperative and the post operative mortality rates were calculated to be 0.0015% and 0.0006% respectively. Thus the overall mortality rate was calculated to be 0.0021%.*

Conclusion: *Oral and Maxillofacial Surgery is a specialty with an extremely low mortality risk, with respiratory complications being the leading cause of mortality in patients reporting to this unit. The mortality rate of this unit is not significantly higher, when compared with other centers throughout the world.*

Key Words: *Mortality rate, General anesthesia, Maxillofacial surgery.*

INTRODUCTION

Maxillofacial surgery is a relatively young specialty of medicine and was established as an organized specialty in second half of 20th century, supported by general surgeons and inspired by talented dentists. There are four sub-specialties in this field, traumatology, orthognathic, cleft and tumor surgery.[1] Recent advances has not only evolved maxillofacial surgery but has also increased the complexity and standards of care of maxillofacial patients. Associated medical problems, severe injuries with blunt trauma and co morbid conditions in geriatric patients need special attention due to its associated risk of mortality.[2, 3] This is all in addition to the risk posed by general anesthesia itself, though studies[4, 5] have shown it to be a negligible risk for mortality by pointing to the decrease in anesthesia related deaths from 1:1560 reported in 1954 versus the rates of 1: 27,838 in the early nineties.[6]

Facial injuries have been the focus of attention in many parts of the world because of its high incidence and diversity.[7] Worldwide indices show road traffic accident to be the major cause of maxillofacial injury. An estimated 1.2 million people round the globe are killed as a result of road traffic injuries each year and the situation in a developing country like Pakistan is no different.[8] Many factors affect mortality rate and outcome after trauma. Age of the patient, concomitant head injuries and increased bleeding are some of the variables increasing death rates after maxillofacial trauma.[9, 10]

Another factor affecting mortality is the standard of surgical care in maxillofacial patient. Stud-

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ies in industrialized countries have shown a per-operative rate of death from inpatient surgery of 0.4 to 0.8% and a rate of major complications of 3% to 17%. These rates are likely to be much higher in developing countries.[11, 12]

Regional studies on incidence and pattern of mortality rate associated with maxillofacial procedures are scarce and local literature on the subject is non-existent. This study was carried out to assess the mortality rate amongst all the preoperative and postoperative patients admitted at the Department of Oral and Maxillofacial Surgery at Khyber College of Dentistry and to find out the leading causes of death as well as to develop protocols to prevent all avoidable causes of mortality at our center in the future.

MATERIALS AND METHODS

This retrospective study was carried out at the Department of Oral and Maxillofacial Surgery at Khyber College of Dentistry, Peshawar from January 2009 to December 2012. After obtaining approval from the Institutional Ethical committee, the death summaries, patient history, examination findings, radiographs, referral reports to other specialties, operation notes and monitoring charts were obtained.

All patients who died after being operated under general anesthesia and those who died during their period of admission in the department were included in the study.

Those patients who died during their referral to this department but were admitted in another hospital were not included in the study. Polytrauma patients were not included in the study unless they had received treatment for their systemic injuries and were discharged from medical hospitals after being decleared stable.

The mortality rate was calculated as number of deaths per total number of patients admitted in the Oral and Maxillofacial surgical unit. Three types of mortality rates were determined, namely the preoperative, postoperative and overall mortality rate. The preoperative mortality rate was calculated as the number of deaths occurring before the patients received treatment under general anesthesia per total number of patients admitted in the unit. The postoperative mortality rate was calculated as the number of deaths occurring after the patients received treatment under general anesthesia per total number of patients admitted in the unit. The overall mortality rate was the sum of the preoperative and postoperative mortality rates. The data was computed into SPSS version 17 and results were obtained in the form of tables. No tests of significance were used.

RESULTS

A total of 3277 patients were admitted to the inpatient ward at the Department of Oral and Maxillofacial surgical unit, Khyber College of Dentistry, Peshawar for undergoing treatment under general anesthesia from January 2009 till December 2012. Of these 3277 patients, 7 patients expired during their admission at the department. Of these 7 patients, the youngest was 12 years old whereas the oldest patient was 75 years old. The mean age of the expired patients was 44.29±22.91 years. All the patients were males.

Trauma was the leading cause for inpatient admissions amongst the expired patients (71.42%) with road traffic accidents and firearm injuries being most common. Elective surgery was the least likely cause for admission with only 2 cases (28.57%). The details of the causes are given in Table 1.

Out of 7, 6 expired patients were classified, according to the American Society of Anesthesiology (ASA), as ASA class I, whereas 1 patient was ASA class III. This patient was the only one from whom high risk consent was taken and he passed away during the immediate postoperative period.

Six out of the 7 patients required referrals to other specialties prior to their demise. The most

Table 1: Causes of admission amongst expired patients

Reason for admission	n	%
Fire Arm Injury	2	28.57
Road Traffic Accident	2	28.57
Bomb Blast Injury	1	14.28
Residual cyst	1	14.28
Squamous cell carcinoma	1	14.28
Total	7	100.0

Table 2: Referrals to other specialties

Specialty referred	Number of referrals	%
Medical unit and ICU	4	36.36
Accidents & Emergency unit	2	18.18
Otorhinolaryngology unit	2	18.18
Cardiology unit	1	9.09
Pulmonology unit	1	9.09
Surgical ICU	1	9.09
Total	**11**	**100**

Table 3: Causes of death

Cause of death	n	%
Aspiration pneumonia	2	28.6
Cardiac arrest	2	28.6
Respiratory failure	1	14.3
Pulmonary contusions	1	14.3
Laceration of carotid artery	1	14.3
Total	**7**	**100.0**

commonly referred specialty was the Medical unit and its associated intensive care unit (36.6%) and the least referred specialties were the Surgical intensive care unit and the cardiology unit with 1 referral each (9.1% each). Some of these patients required multiple calls to more than one specialty. The details of the specialty referred to, are given in Table 2.

Two patients expired in the postoperative period and 5 patients died in the preoperative period, thus the preoperative mortality rate was 0.0015% and the postoperative mortality rate was 0.0006%. The overall mortality rate of the unit was 0.0021% for the period between 2009 to 2012. In the preoperative period, the leading cause of death was aspiration pneumonia. In the postoperative period, the foremost cause of death was cardiac arrest. Overall, the leading cause of mortality was respiratory distress with 4 cases (57.2%). Cardiac arrest was the second most common cause with 2 cases (28.57%). The details of the causes of death are given in Table 3.

DISCUSSION

The Department of Oral and Maxillofacial surgery at Khyber College of Dentistry is a 24 bedded, day and night inpatient facility with a 3 bed Intensive care unit (ICU). It exists as an independent tertiary care unit and not as a part of a medical hospital. This condition is peculiar to our unit only as other public and private hospitals in the province have/are starting oral and maxillofacial units as part of their medical hospitals instead of being isolated units in the premises of a dental college. Despite this, the department works in close liaison with allied specialties of tertiary care hospitals to ensure optimum treatment of its patients.

This 3 years retrospective study showed a mortality rate of 0.0021% with respiratory causes as the predominant cause of death.

Patients who died because of craniofacial trauma in the emergency departments of local hospitals were not made a part of this study as they were not referred to this unit. Only those patients reported to the department who survived and had undergone some form of curative treatment for other systemic injuries and were discharged from the medical hospitals.

There is scant literature on the subject of mortality rates in maxillofacial units. Verco et al[13] studied the incidents requiring transfer to other specialties at the Royal Dental Hospital of Melbourne over a period of 5 years. They reviewed 17557 procedures carried out under general anesthesia and reported no mortalities, although they did report a 0.13% incidence of morbidity that required transfer to other specialties. The most prevalent complication requiring transfer was respiratory in nature and in accordance with our findings. As the Royal Dental Hospital is a day inpatient facility only and uses a stringent criteria for admissions that excludes cases that may require operating times of more than 30-45 minutes or those that significantly medically compromised, its statistics cannot be compared to this department which is a day and night facility, routinely undergoes procedures longer than 1 hour of duration and has its own surgical intensive care unit to deal with critical patients.

Hunter and Molinaro[14] conducted a study to analyze the safety record of the oral and maxillo-

facial residency program at the Boston University Goldman School of Graduate Dentistry from 1990 to 1994. They reported no cases of mortality amongst the 1126 patients operated under general anesthesia, although 2.3% of those cases experienced incidents of morbidity. The leading cause of morbidity was laryngospasm with 9 incidents and second most common was cardiac dysrhythmia with 8 incidents, which tallies with the findings of our study. This study was done on outpatient procedures and limited to those cases requiring less than 30-45 minutes of duration. Its lack of a mortality count can be attributed to its selective patient criteria, careful review of medical history and physical examination and lack of an inpatient facility.

Rajendra et al[15] conducted a study in 2009 at the Justice K. S. Hegde Charitable Hospital, and associated A. B. Shetty Memorial Institute of Dental sciences, Deralakatte, Mangalore on 100 maxillofacial trauma patients between January and December 2004. Their study reported 2 cases of mortality. The cause of deaths of the 2 patients was splenic rupture and aspiration pneumonia respectively. Their mortality rate was found to be 2% and was largely in part to systemic injuries and pulmonary causes which is in conformity with our study, although it reports a higher mortality rate in a much smaller sample size. This can be attributed to the fact that the authors included all patients with maxillofacial injuries and did not discriminate them on the basis of Glasgow Coma Scale (GCS) scores, unlike the present study which only included patients with GCS scores indicating mild or no brain injury.

CONCLUSION

It can be concluded that:

1- Oral and Maxillofacial Surgery is specialty with an extremely low mortality rate.

2- Respiratory complications are the most common cause of death in patients who survive from maxillofacial trauma.

3- General anesthesia poses a negligible mortality risk to ASA class I patients. The only anesthesia related death was that of an ASA class III patient.

4- Five out of 7 patients died, preoperatively, of causes that suggest a deficiency in the proper management of the patients in a medical hospital.

RECOMMENDATIONS

Based on the findings of this study, it is recommended that:

1- All patients of maxillofacial trauma or otherwise should be thoroughly examined for any respiratory and cardiac abnormalities and referred promptly to other specialties when required.

2- The position of a full time emergency medicine specialist should be mandatory in all maxillofacial units that exist outside of a medical hospital.

3- Another study of the same kind should be repeated after every 5 years as a form of a clinical audit to see any improvements or otherwise in the management of patients at this unit.

4- An annual mortality and morbidity conference should be held in the department involving maxillofacial surgeons and allied specialists from the medical field to conduct a critical appraisal of the multidisciplinary treatment approach of patients and suggest ways to decrease the existing morbidity and mortality rate.

5- Residents of Oral and Maxillofacial Surgery should have a minimum of 2 months rotations in a medical or surgical ICU at par with other mandatory rotations fulfilling the requirements for FCPS/MDS.

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