PROSPECTIVE BASIC CLINICAL AUDIT USING MINIMAL CLINICAL DATA SET

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Background: Audit is a means of quality control for medical practice by which the profession should regulate its activities with intention of improving overall patient care. Objective of this study was to report 1 year basic clinical audit of a general surgical ward and comparison of results with available data. **Methods:** All patients admitted and managed in Department of Surgery Unit-II, Liaquat University Hospital, Jamshoro/Hyderabad from January to December 2007 were included in the study for basic clinical audit. Data of all surgical patients admitted during this period were retrieved from the departmental register. Details of surgical procedures and complications were recorded from the patients' charts. **Results:** Total number of patients was 1434, out of which 844 (58.85%) were males and 590 (41.14%) were females. Majority (70.02%) of the patients were between 16 to 50 years of age. Elective surgeries were performed in 487 (33.74%) and emergency surgeries in 430 (29.79%) cases, whereas rest of the 526 patients (36.28%) were managed conservatively. Consultant was the primary surgeon in less than 50% of the procedures compare to post graduate trainees and registrars. The most common surgeries performed in elective wing were inguinal hernia repairs (25.66%) and cholecystectomies (22.99%). In emergency wing, most of the surgeries were exploratory laparotomies (38.13%) and appendicectomies (22.79%). Average duration of hospital stay in elective wing was 1–10 days and in emergency wing it was 2–21 days. There was an overall complication rate of 6.3% and a mortality rate of 2.44% respectively. **Conclusion:** We conclude that surgical audit has potential benefits for patients, clinicians, and provision of services for a continuous education, research and improved practice habits and should be perform on yearly basis. We also recommend the proper computerised audit programs and committees for its monitoring and evaluation.

Keywords: Clinical Audit, Surgery, Outcome

INTRODUCTION

Audit is defined as a means of quality control for medical practice by which the profession shall regulates its activities with the intention of improving overall patient care.[1]

Slee defines clinical audit as 'the evaluation of the quality of medical care as reflected in the medical records'. The term audit is usually associated with accounting –implies numerical review by an outside investigator directed at, among other things, the prevention of fraud[2], but in the clinical setting it is collection of data for purpose of i) setting professional standards, ii) assessing clinical performances, iii) modifying clinical practice.[3]

Historically clinical audit were introduced by Ernest Hey Groves (1908) in Great Britain and Ernest Amory Codman (1910) in United States.[4] In 1987 the process of audit was reviewed and software on clinical data was design to collect, verify and report audit data, resulting in the relatively unobtrusive incorporation of audit in practices into the routines of busy surgical units. The audit system was adopted for a range of surgical specialties and continuing modifications were made and the ability to analyse very large data bases are available.[5]

In Pakistan not much work has been done in this regard and the concept of Clinical Audit is still in infancy and is only practiced in few institutions like Aga Khan University Karachi, Shaukat Khanum Hospital Lahore, Holy Family Hospital Rawalpindi and Abbasi Shaheed Hospital Karachi. Hence this is the First ever Basic Clinical Audit planned and carried out to review and improve our clinical practice in our University Hospital.

MATERIAL AND METHODS

This prospective audit was conducted in the Department of Surgery, Unit II, Liaquat University Hospital Jamshoro/Hyderabad from January 2007 to December 2007. Unit-II deals emergencies in emergency ward at Hyderabad and elective surgeries at university campus Jamshoro. Liaquat University Hospital is a tertiary care hospital draining whole upper Sindh except Karachi and its Suburbs.

Details of all surgical patients admitted during this period was recorded from register maintain by paramedical staff. It records patient's demographic data, date of admission and discharge along with the primary diagnosis and operation performed. This record is than submitted to the main hospital record section at the end of each month.

Details of surgical procedures and complications were recorded from the patient charts submitted to staff nurse at the time of discharge. Mortality register is maintained separately with date and cause of death by paramedical staff. A performa was made that included demographic data, date of

admission, mode of admission, diagnosis and procedure performed, complications, outcome, hospital stay and date of discharge. In the end of the performa any complications, its out come with discharge or death and referral were also included.

RESULTS

Total number of patients admitted were 1434, out of which 887 patients (61.58%) were admitted in elective ward through Out Patient Department at Jamshoro and Hyderabad, while 547 (38.14%) were admitted through Accident and Emergency Department at Hyderabad emergency ward, (Table-1). Out of total patients 844 (58.85%) were males and 590 (41.14%) were females, with a ratio of approximately 1.4:1.

Table-1: Month-wise admission

Month	Elective Admissions	Emergency Admissions	Total
January	37 (3.94%)	53 (9.68%)	90 (6.27%)
February	95 (10.7%)	50 (9.1%)	145 (10.11%)
March	73 (8.22%)	49 (8.95%)	122 (8.50%)
April	89 (10.03%)	59 (10.78%)	148 (10.32%)
May	87 (9.80%)	68 (12.43%)	155 (10.80%)
June	93 (10.48%)	70 (12.79%)	163 (11.36%)
July	82 (9.24%)	65 (11.88%)	147 (10.25%)
August	87 (9.80%)	41 (7.49%)	128 (8.92%)
September	70 (7.89%)	34 (6.21%)	104 (7.25%)
October	58 (6.53%)	15 (2.74%)	73 (5.09%)
November	84 (9.47%)	21 (3.83%)	105 (7.32%)
December	32 (3.60%)	22 (4.02%)	54 (3.76%)
	887 (61.85%)	**547 (38.14%)**	**1434**

Majority of the patient managed were males (58.48%), with a mean age of 35 years; most of the patients were in 16–50 years (70.02%) of age, (Table-2). The youngest patient admitted was two years old child while 7 patients were more than eighty years with one patient more than 90 years.

Table-2: Elective and Emergency cases in Age Groups

Age Group	No. of Patients		Total	%
	Elective	Emergency		
0–15 Years	98	98	196	13.66
16–50 Years	632	372	1004	70.02
51–80 Years	157	77	234	16.31
	887	547	1434	100

Among all admissions 917 patients (63.94%) underwent surgical procedures. The elective surgery was performed in 487 cases (53.10%); most of these were operated by consultants (51.54%), where as emergency surgery was carried out in 430 (46.89%) patients, the major bulk of which was performed by surgical trainees 300 (69.76%), (Table-3). During the period of study, 517 patients (36.45%) were either managed conservatively or refereed for some or any reasons.

The most common diagnosis and procedures performed electively were repair of abdominal hernia's including Incisional hernia (33.47%) and Cholecystectomies for cholelithiasis (22.99%) followed by Ano-rectal diseases (18.48%) like piles, fissure and fistula-in-ano, Lumpectomies and mastectomies for benign and malignant breast conditions (13.75%) and patients presented with different thyroid diseases (11.29%) who underwent either lobectomy or subtotal thyroidectomy for benign/malignant diseases, (Table-4).

The most common emergency procedure remained exploratory laparotomy performed in 196 (45.58%) cases. The indications were gastrointestinal perforations or obstructions, penetrating or non penetrating abdominal trauma. The second commonest procedure was appendicectomy done in 118 (27.44%) cases of acute appendicitis, (Table–4). The other surgical procedures performed at emergency ward includes biopsies (10.93%), drainage of abscess/surgical toilet (8.83%) and repair/suturing of traumatic wounds (n=31) inflicted as result of road traffic accidents/interpersonal conflicts. Average duration of hospital stay was 1–10 days after elective procedures and 2–21 days in emergency procedures.

Table-3: Categories of Surgeons

Operator	Nature of Surgery		
	Elective (n=487)	Emergency (n=430)	Total
Consultant	251 (51.54%)	130 (30.23%)	381 (41.54%)
Surgical Trainees	236 (48.45%)	300 (69.76%)	536 (58.45%)
Total	487 (99.99%)	430 (99.99)	917 (99.99%)

Table-4: Diagnosis and operations performed

Setting	Diagnosis/Surgical procedure	No.	% of cases	% of total
ELECTIVE (n=487)	Hernia repair including incisional hernia	163	33.47%	53.10%
	Cholelithiasis/cholecystectomy	112	22.99%	
	Ano-rectal diseases/ piles, fissure, fistula-in-ano	90	18.48%	
	Breast diseases/ benign/malignant, lumpectomy-mastectomy	67	13.75%	
	Thyroid diseases/ lobectomy, sub-total Thyroidectomy	55	11.29%	
EMERGENCY (n=430)	Exploratory laparotomy/ GI perforation, obstruction, penetrating/non-penetrating abdominal trauma.	196	45.58%	46.90%
	Acute appendicitis/ appendicectomy	118	27.44%	
	Biopsies (elective but carried in emergency theatre)	47	10.93%	
	Drainage of abscess/ surgical toilet	38	8.83%	
	Repair/Suturing of traumatic wounds)	31	7.20%	

The overall complication rate was 6.3% in which 5.1% of the complications were seen in emergency procedures and 1.2% in elective procedures respectively. Wound infection was the most common complication observed in both the procedures. The overall mortality rate during this period was 2.44%, (Table–5).

Table-5: Outcome after admission

Outcome	No. (%)
Discharged (Surgery + Conservatively managed)	1342 (93.58%)
Referred to other hospitals	57 (3.79%)
Death	35 (2.44%)
Total	1434

DISCUSSION

Surgical audit has become an important part of the modern practice of surgery and an integral requirement for the surgeons, continuing professional development and commitment by further analysis thereby resulting in improved practice habits.[6,7] In developed world a very successful national system for audit and comparative audit services are available.

Recently windows software for audit has became available and are updated using various computerized programs.[8–10] Audit is not only data collection it is a continuous education and commitment by further analysis.

Surgical audit data base can assist peer review, answer queries from clinical management, determine surgical work loads, monitor trainees of postgraduates and evaluate over all performance. Simple written methods may still be appropriate and once the basic clinical data is recorded, then it is to be transferred to computer.[11,12]

Despite facing many difficulties like non availability of staff specifically dedicated to the procedure of audit, incomplete surgical documentation of files by trainees and staff, limited financial resources and a proper audit system, we still found many benefits from conducting this study.

In this study a decrease in patients' admission was observed in the month of October (5.09%) due to holy month of Ramadan followed by *Eid-ul-Fitar* and in December (3.76%) due to *Eid-ul-Azha* & later due to unstable political situation in the county. Similar reduction in patient's admission was observed in January (6.27%). Highest number of patients' admission was recorded in the summer compare to winter season i.e in the months of February to August with maximum number in the month of June (11.36%).

This study shows a higher number of elective cases compared to emergency surgeries, a fact which is world wide accepted. In our unit consultant surgeon was the primary surgeon in 381 (41.54%) procedures where as 536 (58.45%) procedures were performed by surgical trainees.. As in our study the western audit of surgical Mortality data also showed that consultant surgeon was the primary surgeons in less than 50% of surgical procedure in teaching hospital.[13]

Among all the cases, abdominal hernia repairs, cholecystectomies, exploratory laparotomies and appendicectomies were the most commonly performed procedures. . However, Bhatti G *et al*[14] and Qureshi *et al*[15] reported Appendiceal diseases most common in their audit. Moreover, we also observed significant number of trauma surgeries (RTAs and assault) as observed by Bhatti G *et al*[14].

In this series of 1434 patient's a high over all complication rate (6.3%) was observed, most of these occurring following emergency procedures (5.1%) however complication rate in elective surgery (1.2%) was comparatively low.. Bhatti G *et al*[14] also report an overall complication rate of 5.9% with 4.9% in emergency and 1% in elective procedures respectively similar to our audit. Similarly Shively *et al*[16] also reported a complication rate of 1.5% after elective surgeries. In Australia, Tasmania audit of surgical mortality reports a very high complication rate of 8% from a pooled result of all surgical specialities.[17] However Brennan *et al*[18] reported a low complication rate of 3.7% in his 30,000 cases.

The lack of senior surgeons, late presentations of rural patients, dirty surgeries with contamination, patient's co-morbidities, pressure on theatre staff due to scanty numbers of old instrument sets available for emergency procedures, substandard theatre's, Scrub & autoclaving areas, lack of staff nurses are some of the practical ground realities that affect the poor outcome in emergency procedures compared to elective procedures. The overall mortality of 2.44% is high in our series of 1434 patient's compared to Bhatti *et al*[14] report of 1.2% mortality in the audit of 855 cases and McGuire *et al* report of 1.8% in the audit of 44,603 consecutive major surgeries. The Mortality rate (5.1%) reported in Scottish surgical mortality after emergency surgery is high compare to our audit.[21] Bhatti *et al*[14] and Hayat *et al*[19] has also reported multiple organ dysfunction syndrome, as a major cause of death similar to our audit.

In Pakistan, not much work has been done and audit remains a neglected issue and its concept is still in infancy compared to Western world. Majority of medical institution including tertiary care hospitals like our university hospital do not have proper audit programs and audit committees that links the surgical outcomes of various hospitals and different surgical units in same hospital.

We suggest that College of Physicians and Surgeons Pakistan (CPSP) and medical universities in Pakistan should play a key role in this regard. As a pilot project, institutions may suggest their surgical departments to submit their departmental audit on regular basis. The participating units should design a performa, to be filled by consultants to enter local audit data. Once the participating unit will be aware of this scheme, there will be more sense of responsibility amongst the senior and junior consultants, enhanced supervision of postgraduate trainees and registrars to minimise complications, more documentation of cases and a large amount of data will be available for research and future planning. This data can be published in

annual report and will be an authenticated document for the purpose of reference, when figures for Pakistan are needed to be made available. We believe that majority of consultants would be prepared to cooperate, if proper guidance and help is given to them especially if this process also helps them in their promotions to higher grades.

When the comparative figures are available from different parts of the country and gross discrepancy noted, institutions may form a committee to quietly look into the matter. Audit should not have any legal implication —the sole purpose of the audit is to learn from each others experiences and to implement steps which are best for patients' management.

Audit is an ally of good surgical practice and needs to be promoted.

CONCLUSION

It is time to formally introduce clinical audit in all teaching hospitals in Pakistan and train clinicians to accept and conduct audit as a constructive and routine exercise. It is time for medical profession to examine its work more critically to enhance their skills thereby reducing patient mortality and morbidity, especially in areas where disease is the biggest killer in all age group.

REFERENCES

1. Russel RCG, Williams NS, Bulstrode CJK, Surgical audit. Baily & Loves short practice of surgery, 23rd addition London: Arnold; 2000.p.1307–13
2. Shaw CD. Aspect of Audit 1. The back ground. Br Med J 1980; 280:1256–8.
3. Sanazaro PJ, Worth RM. Concurrent quality assurance in hospital care, report of a study by private initiative in PSRO. N Eng J Med 1978;298:1171–7.
4. Codman EA. Surgical audit –Lecture. Available at: http://www.edu.rcsed.ac.uk/Lectures/L117.htm (accessed: August 2008).
5. Isbister WH, Simpson JS. A simple surgical audit. Aust NZ J Surg 1987;57:771–4.
6. Dunn C, Fowler S. Comparative audit: An experimental study of 147, 882 general surgical admissions during 1990. Br J Surg 1992;79:1073–6.
7. Williams O. What is clinical audit? Ann R Coll Surg Engl 1996;15:67–79.
8. Aitken RJ, Nixon SJ, Ruckley CV. Lothian surgical audit: a 15-year experience of improvement in surgical practice through regional computerized audit. Lancet 1997;350:800–4.
9. Hunter JG, Lyon C, Galloway K, Putterill M, van Rij A. Complete clinical outcomes audit. Resource requirements and validation of the instrument. Surg Endosc 1999;13:699–704.
10. Stonebridge PA, Thompson AM, Nixon SJ. Completion of the journey of care: Scottish Audit of Surgical Mortality (SASM). J R Coll Surg Edinb 1999;44:185–6.
11. Campbell WB, Souter RJ, Collin J, Wood RFM, Kidson IG, Morris PJ. Auditing the vascular surgical audit. Br J Surg 1987;74:98–100.
12. Ruckley CV. Mechanisms of Audit: discussion paper. J R Soc Med 1984;77:40–4.
13. Semmens JB, Aitken RJ, Sanfilippo FM, Mukhtar SA, Haynes NS, Mountain JA. The Western Australian Audit of Surgical Mortality: advancing surgical accountability Med J Aust 2005;183:504–8.
14. Bhatti G, Haider J, Zaheer F, Khan SQ, Pirzada MT, Khan TM. Surgical Audit of Unit II, Department of Surgery, Abbasi Shaheed Hospital, Karachi. Ann Abbasi Shaheed Hosp Karachi Med Dent Coll 2006;11(2):54–8.
15. Qureshi WI, Durrani KM. Surgical Audit of Acute Appendicitis. Proceeding Shaikh Zayed Postgrad Med Inst 2000;14:7–12.
16. Shively EH, Heine MJ, Schel RH, Sharpe JN, Garrison RN, Vallance SR. *et al*. Practicing surgeons lead in quality care, safety, and cost control. Ann Surg 2004; 239: 752-60.
17. Tasmanian Audit of Surgical Mortality. 2006 annual report. Tasmania: Department of Health and Human Services. Available at: http://www.surgeons.org/Content/NavigationMenu/Research/Audit/TASM_Annual_Report_Final_130606.pdf. (accessed August 2008).
18. Brennan TA, Leape LL, Laird NM, Hebert L, Localio AR, Lawthers AG, *et al*. Incidence of adverse events and negligence in hospitalized patients. N Engl J Med 1991;324:370–6.
19. Hayat W, Fahim F, Cheema A. Mortality analysis of a surgical unit. Biomedica 2004;20:96–8.
20. McGuire HH, Horsley JS, Salter DR, Sobel M. Measuring and managing quality of surgery: statistical vs. incidental approaches. Arch Surg 1992; 127: 733–7.
21. Scottish Audit of Surgical Mortality. 2001 annual report Glasgow: SASM, Royal College of Physicians and Surgeons of Glasgow. Available at http://www.sasm.scot.nhs.uk/REports/2001Report/SASM2001Report.pdf (accessed August 2008).

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