

Frequency of Adverse Events after Implementation of WHO Checklist

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ABSTRACT

Background: Adverse post-surgical events are progressively perceived as a significant perspective for precluding mortality and morbidity in medicinal services framework. Fifty percent of all unfavorable post-surgical outcome in medical department occurring can be prevented. WHO has acquainted an agenda with institutionalize care for the entire patient in operation theaters? This agenda presented in 2009 will be utilized to avert adverse post-surgical events. Utilization of this agenda isn't being a standard operation protocol (SOP) in our setup.

Aim: To assess the frequency of adverse events (AEs) after implementation of WHO checklist.

Methods: It was a descriptive case series performed at surgical wards Mayo Hospital Lahore. In the study, total 610 cases were recruited. Information was gathered from surgical ward of Mayo Hospital, Lahore. Patients are asked to provide their consent to be included in this study. All the data was gathered on an explicitly structured Performa attached. The cases fulfilling inclusion criteria was enlisted upon confirmation. They were evaluated on medical history, clinical assessment, and baseline examination. Information was affirmed by the author for any post-surgical AEs (cautery burns, electro burns, tooth break during anesthesia induction, history of fall from operation table, pain, limbs desensitization after utilization of tourniquet).

Results: The mean age of each of the 610 cases was 26.30 ± 11.39 yrs. There were 144(24%) women and 466(76%) men cases. 190 cases were operated in emergency department and 420 cases undergone elective medical procedure. According to WHO standards, the frequency of adverse events were 4(1%) in the operation theater. Among the detailed AEs in the operation theater there was 1(0.16%) case of fall from the operation table, 2(0.33%) case of needle prick and 1(0.16%) case of incorrect injection.

Conclusion: Execution of the surgical wellbeing agenda by WHO had fair effect on the security culture inside emergency clinic. Only 4(0.66%) AEs were found in our working arrangement after execution of this WHO check list. It is especially basic and essential to ensure the execution of this list in our set up due to burden of work and patient frequency in the surgical units.

Key words: Adverse events, World health organization, patients safety check list, Surgical Procedure

INTRODUCTION

The primary rule of therapeutic sciences is "to do no harm"¹. In tertiary care hospitals, the frequency of adverse events is usually high and their inhibition is becoming an essential study area in order to improve the efficiency of hospitals². The incidence of adverse events is about "3.7%" in New York According to Harvard Medical Practice Study³. The safety of patient is surely one of the basic need in hospitals now a days⁴. The accepted etiology of unfavorable results are nonappearance of any checking/reconnaissance framework or failure of system, however insufficiencies in various levels make the setting wherein human error can have a undesirable effect^{4,5,6}. These adverse events are considered as great cause of major source of mortality as well as morbidity and these are also not easily defended in the court^{7,8}.

Whenever a method is implemented there is risk of unanticipated complications. The issue may emerge because of patient surgical pathology and comorbid diseases or may emerge because of technical issues such as mistakes in drug administration, framework process blunders, mistakes in communication, or a bunch of other sudden issues. Left over foreign bodies keep on being a huge issue with a rate somewhere in the range of 0.3 to 1.0 in every 1,000 surgeries of abdominals⁹. Dental damage happens in almost 1% of general anesthesia⁹. The evaluated pace of wrong site medical procedure shifts generally between .09 to 4.5 in 10000 operations^{10,11}.

WHO has acquainted an agenda with institutionalize care for all the cases undergone surgery. This agenda acquainted in 2009 was utilized to inhibit any complication. Utilization of this agenda isn't being a "standard operation protocol" (SOP) in our daily practice. In this examination we determined the occurrence of AEs in Operation Theater after execution of WHO agenda. The adequacy was contrasted with chronicled studies. No such work has been done locally.

MATERIALS AND METHODS

This descriptive case series was conducted in general surgical wards Mayo hospital during a period of 6 months after synopsis approval. Non probability purposive sampling technique was used. Sample size of 610 patients is assessed using 95% confidence level, 1.5% margin of error with an expected percentage of adverse events as 3.7%³.

Inclusion criteria

- Age more than 14 up to 75 years including both genders.
- Emergency and elective surgery along with WHO check list

Exclusion criteria

- Patients in whom proof of injury could not be estimated such as cases with tooth fracture in trauma or burned by cautery.

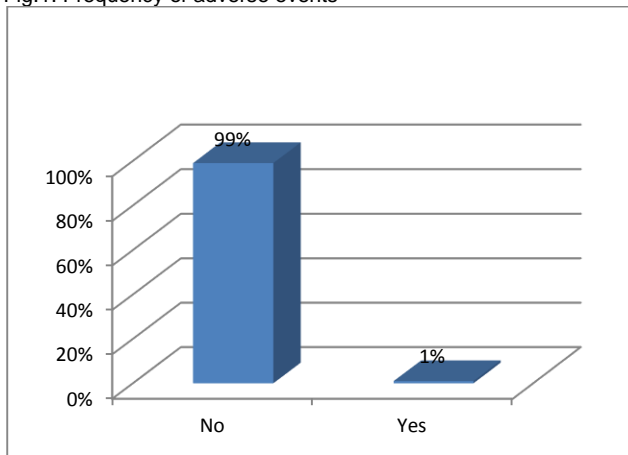
- Patients in whom packing is needed like in liver perforation.

Data collection procedure: Information was gathered from surgical ward of Mayo Hospital, Lahore. Patients are asked to provide their consent to be included in this study. All the data was gathered on an explicitly structured Performa attached. The cases fulfilling inclusion field was enlisted upon confirmation. They were evaluated on medical history, clinical assessment, and baseline examination. All patients had WHO agenda appropriately filled in by residents at the hour of medical procedure. Information was affirmed by the author for any AEs (cautery burns, electro burns, tooth injury during anesthesia induction, history of fall from operation table, pain, limbs desensitization after utilization of tourniquet). Other AEs e.g., wrong case operated, incorrect operation executed, leaving behind foreign bodies, needle perforates and inappropriate blood transfusion information was gathered by reporting of surgeon, helping specialists and theater staff. Operation notes were returned to evaluate the tourniquet time. All the gathered information was entered in a pre-designed questionnaire (Attached). SPSS 15 was used to compute and analyze the data. Frequency and percentages was analyzed for gender and adverse events. Mean±SD was determined for age. Data stratification was done for age, gender and surgery type (emergency/ elective) to tackle confounders. Chi-Square test was used post-stratification with p-value ≤ 0.05 taken as significant.

RESULTS

The mean age of each of the 610 cases was 26.30±11.39 yrs. There were 144(24%) women and 466(76%) men cases. 190 cases were operated in emergency department and 420 cases undergone elective medical procedure. According to WHO standards, the frequency of adverse events were 4(1%) in the operation theater. Among the detailed AEs in the operation theater there was 1(0.16%) case of fall from the operation table, 2(0.33%) case of needle prick and 1(0.16%) case of incorrect injection.

Fig.1: Frequency of adverse events



The stratification of age was organized relative to the frequency of adverse events. The average age of case who suffered adverse events was 27.00±10.13 while the average age of cases who did not face these issues was

26.30±11.40 years respectively. There was no significant difference found in the age of both group of cases during surgery ($p\text{-value}=0.903$). Only male patients have suffered from these adverse events. None of the female patient had any unfriendly occasion. There was no statistically significant relation was found among patients and frequency of the type of adverse event. ($p\text{-value}=0.265$) Stratification was accomplished for kind of surgical procedure relative to the frequency of adverse events. Among 4 adverse events, 3 patients hone through emergency and only 1 patient gone through elective surgery. There was no statistically affiliation was available between sort of medical procedure and event of kind of unfavorable occasion, for example ($p\text{-value}=0.057$)

Table-1: Adverse events as per WHO safety check list

	Adverse Event	
	Yes	No
Wrong patient	0(0%)	610(100%)
Wrong operation	0(0%)	610(100%)
Electrocautery burns	0(0%)	610(100%)
Fall from Operation table	1(0.16%)	609(99.84%)
Left over foreign bodies	0(0%)	610(100%)
Needle prick	2(0.33%)	608(99.67%)
Wrong Injection	1(0.16%)	609(99.84%)
Broken Tooth	0(0%)	610(100%)
Mismatch Transfusion	0(0%)	610(100%)
Tourniquets application	0(0%)	610(100%)

DISCUSSION

Adverse events (AEs) are a significant source of grimness and mortality. Understanding record audit researches demonstrated that the frequency of unfavorable occasions changed from 3-17% among hospitalized cases. Prevention of roughly half of the AEs can be done. AEs leads to minor or impermanent disability, however an extent of the AEs, 4-21%, added to death. Every one of these investigations have indicated that a high level of AEs are owing to surgical specialties, between 51%- 77%¹²⁻²¹. AEs owing to surgical specialties in detail are presently over ten years old according to previous populace based researches. From that point forward surgical systems as well as quality affirmation have grown quickly. The surgical methods have been upgraded, expanding the open doors for excellent management of complicated illnesses. In any case, this likewise builds the potential for blunders that can bring harm to the patient, prompting handicap or death. Meanwhile, numerous arrangements intended to diminish the hazard related with medical procedure have been established^{3,22,23,24}

In recent years, the most notable effort to prevent AEs due to negligence is by WHO which developed a Surgical Safety Checklist. A study published in 2009 showed that the comprehensive checklist can reduce morbidity and mortality in worldwide populace. The checklist outlines essential protocol of surgical care and is developed to be simple, to be extensively applicable, and to tackle common and possibly hazardous gaps. Utilization of the checklist can identify lapses in per-operative routine and can establish or approve observance to verified care standards that can improve surgical results and decreased at hand

complications. In Pakistan the use of surgical safety check list is practiced only in three hospitals^{25,26}.

Other hospitals are practicing different protocols. There is no standardized protocol for the safety procedures to be adopted in the surgical theatres of tertiary care hospitals. There is a gross need for some standardised safety tool for the avoidance of preventable adverse events in surgical care. The WHO Surgical Safety Check lists seems to be quite simple and appropriate tool which can easily be implemented in tertiary care hospitals²⁶.

Following the mind-boggling proof of AEs in clinic practice, the WHO World Alliance for Patient Safety has propelled the Safe Surgery Saves Lives crusade that has built up a surgical security agenda expected to enhance the patient wellbeing. The execution of this agenda has met with blended responses in various foundations. Numerous nations have still not embraced its utilization. In this article, a short audit is introduced with respect to the role of the WHO agenda, hindrance to its usage and procedures for effective implementation.

About 190 cases were operated in emergency department and 420 cases undergone elective medical procedure. According to WHO standards, the frequency of adverse events were 4(0.65%) in the operation theater. Among the detailed AEs in the operation theater there was 1(0.16%) case of fall from the operation table, 2(0.33%) case of needle prick and 1(0.16%) case of incorrect injection.

Marieke Zegers in his study determined the incidence, consequences, preventability, causes and potential strategies to prevent AEs among hospitalized patients in surgical units. In his findings he reported that surgical AEs occurred in 3.6% of hospital admissions and embodied 65% of all AEs. Forty-one percent of the surgical AEs was considered to be preventable. Almost 40% of the surgical AEs were infections, 23% bleeding, and 22% injury by mechanical, physical or chemical cause. Human factors were involved in the causation of 65% of surgical AEs and were considered to be preventable through quality assurance and training.

Marieke Zegers in his investigation decided the frequency, results, inevitability, etiology and possible procedures to avoid AEs among hospitalized patients in surgical departments. In his discoveries he detailed that surgical AEs happened in 3.6% of clinic affirmations and embodied "65%" of all AEs. 41% of the surgical AEs were viewed as avoidable. Practically 40% of the surgical AEs were contaminations, 23% blood loss, and 22% mechanical trauma, chemical or physical reason. Human error were taken place with the causation of 65% of surgical AEs and were viewed as avoidable by quality confirmation and training.(8)Frequency of AEs in this investigation was significantly more lower as compared to the study performed by Marieke Zegers.

According to the results of a local study conducted in Mayo Hospital Lahore in which WHO surgical safety checklist was implemented in operation theaters of a tertiary care hospital to measure baseline surgical safety protocols and outcome measurements. As per findings of the study it was observed that the rate of post-operative infection fell from 33.7% to 16.2% ($p < 0.001$). Average hospital stay was reduced from 7.8 days to 6.5 days

($p < 0.001$). Use of non-sterilize instruments reduced from 38% to 0% ($p < 0.001$)

As per the aftereffects of a local report led in Mayo Hospital Lahore in which WHO surgical safety agenda was executed in OT of a tertiary care hospital to gauge basic surgical safety protocols and result estimations. According to discoveries of the investigation it was seen that the chances of post-operative disease ranging from 33.7-16.2% ($p < 0.001$) Average hospital stay was reduced from 7.8 days to 6.5 days ($p < 0.001$). The utilization of non-disinfect tools decreased from 38%-0% ($p < 0.001$)²⁷

The use of this checklist was associated with about 40% reduction in major complications and mortality reduction by 47%. Several studies have shown that majority of surgical errors about half to two third occur before or after operation, assembling it likely that a more substantial improvement in safety could be attained by pointing the entire surgical path way.

Routine surgery requires a complicated synchronization of surgeons, anesthetists, nurses and support staff to provide timely and effective care; intensified patient perception and time pressure increase the probability for dangerous mistakes and lapses in settled protocols of care. Institutions requiring emergency intervention, however there is concern that use of a checklist will intrude with work process and defer helpful consideration in ways that increment hazard to patients. There are two different ways to see this issue, one is delay in care and helpful intervention, second is adherence to check lists will improve consistence with fundamental measures of mind and improve result following surgical procedure.

CONCLUSION

According to result of this examination occurrence of AEs after usage of WHO protocol was just observed in 4(0.66%). This discoveries high lights the significance of WHO check list in OT in our practical environment. Just as it was accepted that by routinely checking regular safety concerns, and by better group correspondence and elements, perioperative grimness and mortality could be enhanced.

REFERENCES

1. Garner JSas. In Care in the operating room. Bailey & Love's short practice of surgery. London: Hodder Education; 2008. p. 204.
2. Berwick DM, Leape LL. Reducing errors in medicine. *Bmj*. 1999;319(7203):136-7.
3. Kable A, Gibberd R, Spigelman A. Adverse events in surgical patients in Australia. *International Journal for Quality in Health Care*. 2002;14(4):269-76.
4. van Beuzekom M, Boer F, Akerboom S, Hudson P. Patient safety in the operating room: an intervention study on latent risk factors. *BMC surgery*. 2012;12(1):10.
5. Amalberti R, Auroy Y, Berwick D, Barach P. Five system barriers to achieving ultrasafe health care. *Annals of internal medicine*. 2005;142(9):756-64.
6. Cook R, Rasmussen J. "Going solid": a model of system dynamics and consequences for patient safety. *Quality and Safety in Health Care*. 2005;14(2):130-4.

7. Makary MA, Sexton JB, Freischlag JA, Millman EA, Pryor D, Holzmueller C, et al. Patient safety in surgery. *Annals of surgery*. 2006;243(5):628.
8. Zegers M, de Bruijne MC, de Keizer B, Merten H, Groenewegen PP, van der Wal G, et al. The incidence, root-causes, and outcomes of adverse events in surgical units: implication for potential prevention strategies. *Patient Saf Surg*. 2011;5:13.
9. Van Beuzekom M, Boer F, Akerboom S, Hudson P. Patient safety: latent risk factors. *British journal of anaesthesia*. 2010;105(1):52-9.
10. Snijders C, Van der Schaaf T, Klip H, Fetter RvLW, Molendijk A. Feasibility and reliability of PRISMA-medical for specialty-based incident analysis. *Quality and Safety in Health Care*. 2009;18(6):486-91.
11. Wubben I, Van Manen J, Van den Akker B, Vaartjes S, Van Harten W. Equipment-related incidents in the operating room: an analysis of occurrence, underlying causes and consequences for the clinical process. *Quality and Safety in Health Care*. 2010;19(6):1-7.
12. Baker GR, Norton PG, Flintoft V, Blais R, Brown A, Cox J, et al. The Canadian Adverse Events Study: the incidence of adverse events among hospital patients in Canada. *Canadian Medical Association Journal*. 2004;170(11):1678-86.
13. Brennan TA, Leape LL, Laird NM, Hebert L, Localio AR, Lawthers AG, et al. Incidence of adverse events and negligence in hospitalized patients: results of the Harvard Medical Practice Study I. *New England Journal of Medicine*. 1991;324(6):370-6.
14. Davis P, Lay-Yee R, Briant R, Ali W, Scott A, Schug S. Adverse events in New Zealand public hospitals I: occurrence and impact. 2002.
15. Davis P, Lay-Yee R, Briant R, Ali W, Scott A, Schug S. Adverse events in New Zealand public hospitals II: preventability and clinical context. *NZ Med J*. 2003;116(1183):U624.
16. Leape LL, Brennan TA, Laird N, Lawthers AG, Localio AR, Barnes BA, et al. The nature of adverse events in hospitalized patients: results of the Harvard Medical Practice Study II. *New England Journal of Medicine*. 1991;324(6):377-84.
17. Michel P, Quenon JL, de Sarasqueta AM, Scemama O. Comparison of three methods for estimating rates of adverse events and rates of preventable adverse events in acute care hospitals. *Bmj*. 2004;328(7433):199.
18. Schiøler T, Lipczak H, Pedersen BL, Mogensen T, Bech K, Stockmarr A, et al. [Incidence of adverse events in hospitals. A retrospective study of medical records]. *Ugeskrift for laeger*. 2001;163(39):5370-8.
19. Thomas EJ, Studdert DM, Burstin HR, Orav EJ, Zeena T, Williams EJ, et al. Incidence and types of adverse events and negligent care in Utah and Colorado. *Medical care*. 2000;38(3):261-71.
20. Vincent C, Neale G, Woloshynowych M. Adverse events in British hospitals: preliminary retrospective record review. *Bmj*. 2001;322(7285):517-9.
21. Wilson RM, Runciman WB, Gibberd RW, Harrison BT, Newby L, Hamilton JD. The quality in Australian health care study. *Medical Journal of Australia*. 1995;163(9):458-71.
22. Gawande AA, Thomas EJ, Zinner MJ, Brennan TA. The incidence and nature of surgical adverse events in Colorado and Utah in 1992. *Surgery*. 1999;126(1):66-75.
23. Lives SSS. *The Second Global Patient Safety Challenge*. World Health Organization. 2007.
24. Steel K, Gertman PM, Crescenzi C, Anderson J. Iatrogenic illness on a general medical service at a university hospital. *The New England journal of medicine*. 1981;304(11):638-42.
25. Haynes AB, Weiser TG, Berry WR, Lipsitz SR, Breizat A-HS, Dellinger EP, et al. A surgical safety checklist to reduce morbidity and mortality in a global population. *New England Journal of Medicine*. 2009;360(5):491-9.
26. Toor AA, Syed R, Syeda A, Nigh-e-Mumtaz S, Yousuf M. Surgical Safety Practices in Pakistan. *Breast*. 2013;8:7.
27. Toor AA, Bhutta AR, Sarwar H, Cheema MA. Implementation of Surgical Safety Checklist Reduces Morbidity in a Tertiary Care Hospital. *Annals of King Edward Medical University*. 2012;18(4)