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Audit on appropriate usage of available standard ASA and AABGI monitoring among anesthetist's in operation room for anesthetized patients, at Bahir Dar University Tibebe Ghion comprehensive and specialized hospital, northwest Ethiopia, 2024: institutional based cross sectional study

Abstract

Background: The use of "standard ASA monitors" refers to the essential physiological monitoring devices recommended by the American Society of Anesthesiologists. These include pulse oximetry, electrocardiography, noninvasive blood pressure monitoring, and temperature monitoring. Additional monitoring includes end-tidal carbon dioxide levels, inspired oxygen concentration, and the use of alarms for low oxygen concentration and ventilator disconnection. It is vital to continuously and periodically monitor vital signs and hemodynamics throughout the perioperative period.

Objective: To assess and improve the daily practice of anesthetist's usage of available standard ASA monitoring in the operation room for anesthetized patients, at Tibebe Ghion Comprehensive and Specialized Hospital, northwest Ethiopia, 2024.

Methodology: All consecutive three hundred forty-one surgical producers were observed to assess the usage of standard ASA and AABGI monitoring at the TGSCH surgical rooms were prospectively observed, irrespective of their diagnosis for one month and one week.

Result: A total of 341 surgical procedures was observed and anesthetists frequently used recommended monitoring practices such as the presence of professional anesthetists in the operating room (100%), NIBP monitoring (84.2%), continuous ECG monitoring (74.5%), pulse oximetry (100%), and alarms (70.4%). On the other hand, temperature monitoring was less frequently used by most anesthetists (38.1%), along with urine output monitoring (61.3%), ETCO2 monitoring (16.1%), and airway pressure monitoring (69.5%). Notably, the setup did not have access to neuromuscular monitoring and devices to measure the level of hypnosis.

Conclusion and Recommendation: the recommended ASA and AABGI standards monitoring were below the recommended level so training should be given for all anesthetists who will be involved in anesthesia providing and regular re-auditing should be done to attain the given standards.

Keywords: ASA, AABGI, monitoring, anesthetists, operation room, and patients

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Introduction

Patients who are sedated or anaesthetized must get the same level of care and monitoring during transfer as they would in an operating room, and staff with the necessary training and expertise must accompany the patient.[1] When a patient is sedated, they need to be monitored appropriately with an end-tidal carbon dioxide monitor, NIBP, ECG, and pulse oximetry.[2] The basic physiologic monitors that the American Society of Anesthesiologists recommends are sometimes referred to as "standard ASA monitors".[3] Continuous monitoring, as described by the ASA standards for monitoring, is defined as measurement that is repeated often and steadily in uninterrupted, continuous monitoring. An electrocardiography (ECG), noninvasive blood pressure monitor, temperature monitor, and pulse oximetry are examples of standard ASA monitors used on the patient.[1] The assessment of end-tidal carbon dioxide (ETCO2), inspired oxygen concentration, usage of low oxygen concentration, and ventilator disconnect warnings are further features of the ASA monitoring guidelines.[4]

During the perioperative period, anesthesiologists typically monitor vital signs at 5-minute intervals in accordance with clinical conventions and guidelines from the American Society of Anesthesiologists (ASA) five minute intervals for vital sign monitoring are adequate when patients are hemodynamically stable.[5] Nevertheless, this period might not be enough to correctly measure quickly changing hemodynamics in patients who are hemodynamically unstable.[6]

It is crucial to monitor vital signs throughout the perioperative phase, including mean arterial pressure (MAP), heart rate (HR), respiration rate, and body temperature, in order to assess patients' hemodynamic condition and plan future therapies.[7] Sudden alterations in vital signs have the potential to cause serious cardiovascular consequences, including myocardial infarction, angina, and cerebral stroke. Vital sign monitoring is clinically crucial during endotracheal intubation, especially in patients who are at risk for cardiovascular problems.[8] The primary factor that determines patient safety during anaesthesia is the presence of an experienced and well qualified anesthesiologist. But mistakes are unavoidable, and numerous studies have demonstrated that negative events and mishaps are often caused, at least in part, by anaesthetist mistakes.[9]

The Association of Anaesthetists of Great Britain and Ireland and other recommendations should be followed while using intraoperative monitoring equipment. Accident during the perioperative phase will be avoided by monitoring. Nonetheless, there is strong evidence that it lowers the chances of mishaps and accidents by identifying the effects of mistakes and providing early notice when a patient's condition is declining.[3,10] Temperature monitoring is crucial during general anaesthesia and surgery. The most suitable locations to monitor temperature are nasopharyngeal, esophageal, and axillary sites. Thermistors are semiconductors that change in electrical resistance in response to variations in temperature. Temperature probes are used to measure the temperature of the bladder within Foley catheters.[11]

During any procedure, it is crucial to keep vigilant tabs on the depth of anaesthesia. Too-light anaesthesia increases the danger of memory or awareness during anaesthesia, whereas too-deep anaesthesia can alter hemodynamics.[12] Being aware when under anaesthesia is a potentially dangerous side effect that could have long-term psychological effects including anxiety and posttraumatic stress disorder and bi-spectral index (BIS) score below 60 is associated with a lower incidence of anaesthesia awareness.[13] To assess the level of anaesthesia, a number of neuron monitors based on the evoked potentials or processed electroencephalogram have been developed.[14]

Methods

The study was carried out at the surgical operating room of the Tibebe Ghion Comprehensive Specialized Hospital, which is situated in Bahir Dar, Ethiopia, at the Bahir Dar University, College of Medicine and Health Science. Regardless of their diagnosis, 341 surgical patients who had procedures at the Tibebe Ghion Comprehensive Specialized Hospital surgical operation room were evaluated using a pre-formed ASA and AABGI standard basic intraoperative patient monitoring during anaesthesia for one month and one week. SPSS version 25 was used to code, enter, validate, and clean the data. Graphs, frequencies, and percentages were used to express the results. Checklist that originated from the ASA and AABGI intraoperative patient monitoring guidelines (Table 1).

Table 1 Data collection tools based on the recommendations of ASA and AABGI guideline

Standards	Target (%)	Evidence	Data source
Presence of anesthetists in the operation room throughout the operation	100	ASA&AABGI	Asking and Direct Observation
Use functional NIBP monitoring	100	ASA&AABGI	Asking and Direct Observation
Use continuous ECG monitoring	100	ASA&AABGI	Asking and Direct Observation
Use available functional pulse oximetry	100	ASA&AABGI	Asking and Direct Observation
Use available temperature monitoring	100	ASA&AABGI	Asking and Direct Observation
Use available neuromuscular monitoring	100	ASA&AABGI	Asking and Direct Observation
Urine output monitoring	100	ASA&AABGI	Asking and Direct Observation
use available end-tidal carbon dioxide (ETCO2) monitoring	100	ASA&AABGI	Asking and Direct Observation
Use available hypnosis level of measuring device	100	ASA&AABGI	Asking and Direct Observation

Results

A total of three hundred forty one surgical producers of this 141 were general surgery procedures,100 were obstetric procedures and 100 were orthopedic procedures and what available ASA and AABGI standard monitoring uses for to monitor the physiologic changes after anesthetize the patients were observed prospectively with the response rate of 100%. The routine recommended of AABGI and ASA monitoring for anesthetized patients against the standard was evaluated and described as percent and frequency by table and graphs. The results showed that most of anesthetists use the following recommended ASA and AABGI monitoring's frequently, Presence of anesthetists in OR (n=341,100%), NIBP monitoring (n=287, 84.2%), continuous ECG monitoring (n=254, 74.5%), pulse oximetry (n=341,100%), alarms (n=240, 70.4%) (Figure 1, Table 2).

Temperature monitoring (n=130, 38.1%), Urine output monitoring (n=209, 61.3%), $ETCO_2$ monitoring (n=55, 16.1%), Airway pressures monitoring's (n=237, 69.5%) were used less frequently by most of anesthetists. Wheal neuromuscular monitoring and hypnosis level measuring devices were not available in our setup (Figure 2, Table 2).

Table 2 Recommended ASA and AABGI monitoring's and there compliance Tibebe Ghion specialized and comprehensive hospital operation room

Recommended ASA and AABGI monitoring for anesthetized patients	Frequency			Compliance in Percent (100%)
	Yes	No	Not available	
Presence of anesthetists in OR	341	0	0	100
Use functional NIBP monitoring	287	54	0	84.2
Use continuous ECG monitoring	254	87	0	74.5

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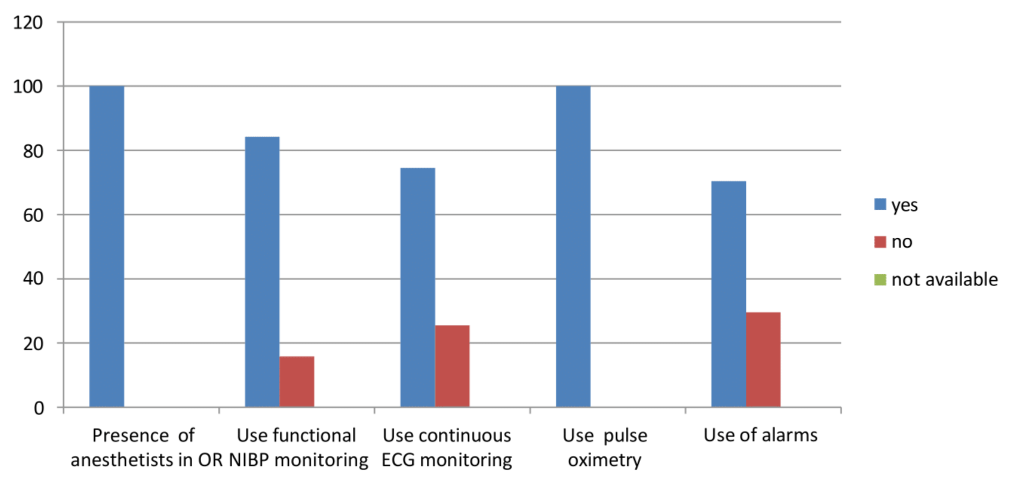

Figure 1 Most frequently use recommended ASA and AABGI monitoring's.

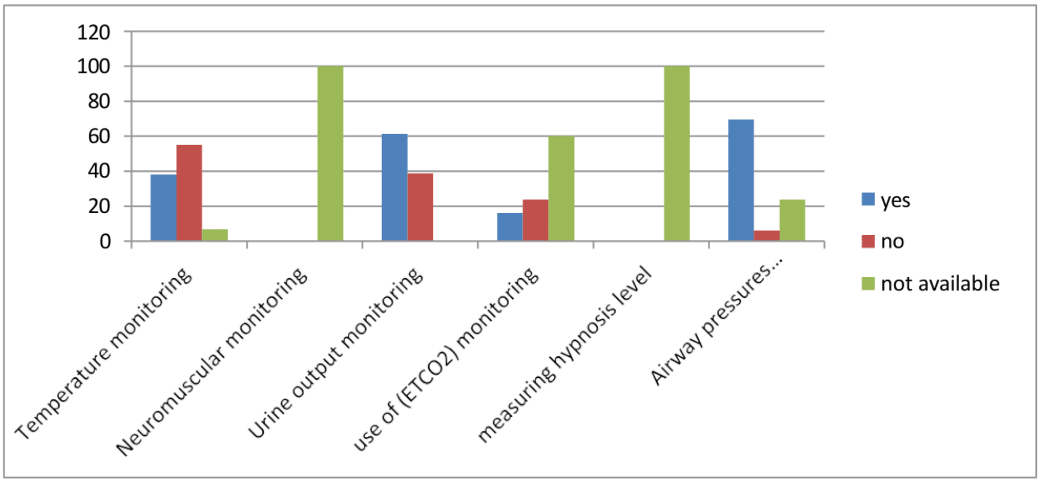

Figure 2 Less frequently and non-available ASA and AABGI monitoring's.

Discussion

This audit determined whether standard ASA and AABGI monitoring use appropriately intraoperatively for anesthetized patients in Bahir Dar University Tibebe Ghion referral hospital meet the standards or not. Standard monitoring's essential care during anaesthetized or sedated patients in the operating theatre.[1] During the study period all anesthetist were present in the operation room through the operation which was good since there is not monitoring substitute's professional anesthetists.[4] Whatever the operation type all anesthetist were use plus oximetry for all patients to monitor the tissue oxygen saturation was good practice since measuring oxygen saturation is too important to assess the tissue oxygen level and to diagnose hypoxia.[15] According to our audit most of anesthetists use noninvasive blood pressure monitoring and continues ECG monitoring unless conditions are not allowed like inappropriate inflating cuff, difficult positioning and nonfunctional monitoring's and is good practice since ECG and NIBP monitoring are important to diagnose many physiologic changes.[16,17]

According to ASA and AABGI intraoperative standard patient monitoring need to be full fill for all procedures but in our audit we found that most of anesthetists are not use temperature monitoring; Eventhogh mentoring temperature change of anesthetized patients is vital to have good postoperative outcome.[11] As a waste product, the cells utilize the oxygen and release carbon dioxide (CO_2). End-tidal carbon dioxide ($ETCO_2$) monitoring is not commonly used by anaesthetists, despite the fact that CO_2 and oxygen both go through a number of processes before being evacuated from the body.[18] Even though ASA and AABGI guidelines recommends usage of measuring hypnosis level by bi-spectral index (BIS and neuromuscular monitoring for anesthetized patients, but since we live on third world country those monitoring's is not available in our setup.

Conclusion and recommendation

The usage available patients monitoring's was unsatisfactory in our hospital compared with the recommendations of the ASSA and AABGI intraoperative monitoring guideline and there should be avail neuromuscular and hypnosis level monitoring device in our setup.

Acknowledgments

We wish to submit an original audit entitled "Audit on appropriate usage of available standard ASA and AABGI monitoring among anesthetist's in operation room for anesthetized patients" for consideration by "Journal of anesthesia and critical care" we confirm that this work is original and has not been published elsewhere, nor is it currently under consideration publication elsewhere. We aimed

to determine whether anesthetists are use available standard ASA and AABGI monitoring's appropriately at Bahir Dar university Tibebe Ghion referral hospital meet the standards or not.

Conflicts of interest

Finally, we have no conflicts of interest to disclose.

References

1. Lockey DJ, Crewdson K, Davies G, et al. AAGBI: Safer pre–hospital anaesthesia 2017: Association of Anaesthetists of Great Britain and Ireland. *Anaesthesia.* 2017;72(3):379– 390.
2. Conway A. Is sedation by non–anaesthetists really safe? *Br J Anaesth.* 2014;112(3):583–584.
3. Thompson JP, Mahajan RP. Monitoring the monitors—beyond risk management. *Br J Anaesth.* 2006;97(1):1–3.
4. Gelb AW, Morriss WW, Johnson W, et al. World Health Organization–World Federation of Societies of Anaesthesiologists (WHO–WFSA) International Standards for a Safe Practice of Anesthesia. *Can J Anaesth.* 2018;65(6):698–708.
5. Gregorini P. Comparison of four methods of automated recording of physiologic data at one minute intervals. *J Clin Monit.* 1996;12(4):299–303.
6. Gravenstein JS, de Vries A, Beneken JE. Sampling intervals for clinical monitoring of variables during anesthesia. *J Clin Monit.* 1989;5(1):17–21.
7. Grant C, Ludbrook G, Hampson EA, et al. Adverse physiological events under anaesthesia and sedation: a pilot audit of electronic patient records. *Anaesth Intensive Care*. 2008;36(2):222–229.
8. Moorman RC, Mackenzie CF, Ho GH, et al. Automated real– time data acquisition and analysis of cardiorespiratory function. *Int J Clin Monit Comput.* 1991;8(1):59– 69.
9. Webb RK, Currie M, Morgan CA, et al. The Australian Incident Monitoring Study: an analysis of 2000 incident reports. *Anaesth Intensive Care.* 1993;21(5):520– 528.
10. Moller JT, Pedersen T, Rasmussen LS, et al. Randomized evaluation of pulse oximetry in 20,802 patients: I. Design, demography, pulse oximetry failure rate, and overall complication rate. *Anesthesiology.* 1993;78(3):436–444.
11. Yeoh WK, Lee JKW, Lim HY, et al. Re–visiting the tympanic membrane vicinity as core body temperature measurement site. *PLoS One.* 2017;12(4):e0174120.
12. Froese L, Dian J, Gomez A, et al. Association Between Processed Electroencephalogram–Based Objectively Measured Depth of Sedation and Cerebrovascular Response: A Systematic Scoping Overview of the Human and Animal Literature. *Front Neurol.* 2021;12:692207.
13. Avidan MS, Zhang L, Burnside BA, et al. Anesthesia awareness and the bispectral index. *N Engl J Med.* 2008;358(11):1097–1108.
14. Ge SJ, Zhuang XL, Wang YT, et al. Changes in the rapidly extracted auditory evoked potentials index and the bispectral index during sedation induced by propofol or midazolam under epidural block. *Br J Anaesth.* 2002;89(2):260–264.
15. Pan PH, Gravenstein N. Intraoperative pulse oximetry: Frequency and distribution of discrepant data. *Journal of Clinical Anesthesia.* 1994;6(6):491–495.
16. Stenglova A, Benes J. Continuous non–invasive arterial pressure assessment during surgery to improve outcome. *Frontiers in medicine.* 2017;4:202.
17. Benson B, Belle A, Lee S, et al. Prediction of Episode of Hemodynamic Instability Using an Electrocardiogram Based Analytic: A Retrospective Cohort Study. *medRxiv.* 2023:2023.06. 08.23291138.
18. Hill GE, Joshi GP. Intraoperative End Tidal Carbon Dioxide Concentrations: What Is the Target? *ASA Monitor.* 2009;73(4):12–14.