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Original Research Paper

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PATIENT SAFETY CHECKLIST IN NEUROANAESTHESIA: AN IMPACT ON PROTOCOL AND OUTCOME.

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ABSTRACT

BACKGROUND: Surgical safety checklists is a common tool to prevent human fallacies and may help in avoiding complications .Major surgeries like neurosurgery need a thorough preparation and a specific checklist tailored to neurosurgery which may serve the purpose .So we intend to follow the neurosurgical safety checklist to elude anticipated complications.

Objectives

1. To identify the adherence to various elements of the Modified WHO SSC for neurosurgery.
2. To analyse how a mandatory speciality-specific checklist practice can help in early identification of those interventions that are specific to neurosurgery, which can otherwise be overlooked.

METHODOLOGY:

- Study Design: Observational study
- Duration of study: From May 2021 to August 2021.
- Sampling Method: Convenience sampling
- Sampling Procedure: Systematic Random Sampling.

RESULT:

This study was carried out in 77 patients undergoing various neurosurgery procedures and was found that none of the patients had diagnosis, procedure written on the name tag in pre-op period and ICP monitoring tools were not available. It was found that the anaesthesiologist as a safety list coordinator can implement the checklist ensuring minimal complications related to the surgery and also active involvement of all the members.

CONCLUSION:

The implementation of surgical safety checklist for Neurosurgery, by a designated checklist co-ordinator, can rectify anaesthetic and surgical facets promptly, without increasing the time required for the operation and also reduces the risk for post-op recovery.

KEYWORDS : Neuroanaesthesia, Post-operative recovery, Surgical Safety Checklist

INTRODUCTION:

As a specialty, neurosurgery differs from many other surgical subspecialties in its delicate nature. It involves a high level of expertise coupled with enduring and long duration of working hours. Among neurosurgical patients, a severe pre-operative or intraoperative complication frequently leads to a great amount of harm and morbidity. Although surgical care can prevent loss of life or limb, it is also associated with a considerable risk of complications and death. Post-operative recovery after neurosurgical complications may be very complex and require a long rehabilitation period and high-level resources.[1] So we intend to follow the neurosurgical safety checklist to elude anticipated complications.[2]

Checklists are a common tool to prevent human errors and facilitate mandatory inspection of the equipment in complex and high-intensity work environments. These have been noticed to be more beneficial in low-income and middle income countries than in developed countries. However, the discussion of causes of observed variation in the advantages of SSC is merely speculative in the literature.[3]

The WHO SSC though comprehensive, is envisaged to cover all the surgical sub-specialities. Hence, WHO encourages that each speciality can use modified SSC specific to their requirements complying with certain mandatory protocols. Ever since the implementation of the WHO SSC, vast progress has been made in surgical neurosciences that mandates specific intra-operative essentials not required in other surgical sub-specialities potential safety concerns to mitigate near misses and avert potential complications.The global experience with a speciality-specific checklist in neurosurgery is limited.[4]

The safe surgery checklist (SSC) was a global initiative introduced by the World Health Organization (WHO) in 2009, designed to reduce perioperative morbidity and mortality.[5,6,7] The SSC is divided into 3 "moments": briefing, time out, and debriefing. Briefing occurs before induction of anaesthesia, time out occurs before the start of the surgical procedure, and debriefing occurs after the procedure is completed.[8] Ideally, during these 3 moments, the entire health care team is engaged in a discussion about the procedure and potential safety concerns to mitigate near misses and avert potential complications.

The primary aim of this study was to identify the adherence to various elements of the Modified WHO SSC for neurosurgery by the perioperative care team. The secondary aims were to evaluate how a mandatory speciality-specific checklist implementation practice can help in early identification of those therapeutic aspects that are pertinent and specific to neurosurgery, which can otherwise be missed.

METHODOLOGY

Study Type And Design:

This was a cross-sectional type of study conducted on patients undergoing neurosurgery at R. L. Jalappa Hospital and Research centre, Tamaka, Kolar.

Study Duration:

It was carried out during the period from May 2021 to August 2021

Sampling Method
Simple/Stratified/Systemic Random Sampling was used to derive the samples. Chi-Square test, Fisher exact test or any other suitable method at the time of analysis was done.

Study Instrument And Data Collection
This study was carried out in all the patients undergoing neurosurgical procedures, informed consent was taken from the patients prior to the surgery. A check-list was used during the pre-op, intra op and post-op period consisting of sign-in, time-out and sign-out.

Statistical Analysis
Statistical Methods:
After checking the completeness of the collected data, it was entered in the Microsoft excel spreadsheet. Data analysis was performed using Statistical Package for Social Sciences (SPSS 22.0.

Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance. The following assumptions on data is made, **Assumptions: 1.**Dependent variables should be normally distributed, 2.Samples drawn from the population should be random, Cases of the samples should be independent

Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups (Inter group analysis) on metric parameters. Leven`s test for homogeneity of variance has been performed to assess the homogeneity of variance.

Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups, Non-parametric setting for Qualitative data analysis. Fisher Exact test used when cell samples are very small.

Ethical Consideration And Confidentiality
All participants were informed regarding the purpose of study, benefits, procedure, and confidentiality of the research study. The study was undertaken after getting informed consent from the participants.

RESULTS:
Table 1:Descriptive Statistics

Variables	Minimum	Maximum	Mean	Standard Deviation
AGE (YEAR)	7.000	75.000	44.779	15.005
WEIGHT(KG)	15.000	98.000	65.078	11.794
HEART RATE	52.000	110.000	79.532	11.331
SBP	100.000	176.000	128.390	15.029
DBP	60.000	98.000	79.870	9.701

Table 2: Comparison Of Pre-op Checklist Score, Sign–in Score, Time Out Score And Sign Out Score According To Age

Variables	Age in years		Total	P Value
	Less than Median	More than Median		
PRE -OP CHECKLIST	8.23±0.43	8.15±0.44	8.19±0.43	0.390
SIGN-IN	12.91±1.27	12.85±1.05	12.88±1.17	0.842
TIME-OUT	9±3.13	9.29±2.78	9.13±2.97	0.669
SIGN OUT	6.67±1.61	7.06±1.58	6.84±1.6	0.298

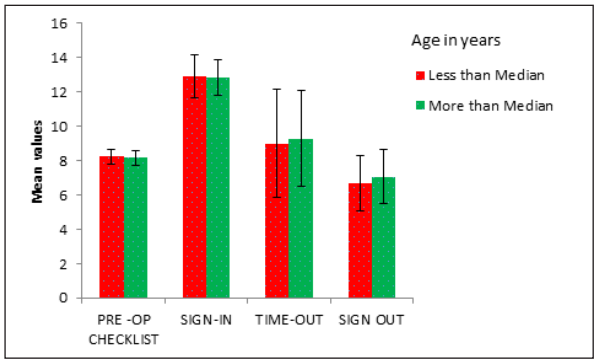

Figure1: Check List And Mean Values

Pre-op: From our study we analysed that in the checklist of pre-op for all the patients **100%(77)** informed consent was taken, dentures were removed, IV cannula was in situ, NPO was maintained , pre-op medications were given and radiological images were available.

1% Patients did not have identification tag and also parts were not prepared locally.

78% did not have blood products arranged at the bank.

None of them had diagnosis and side of surgery on the name tag.

Sign-In: This checklist showed that in 100% patients all the necessary monitors were checked and ready, artificial implants were removed, anaesthesia checklist was completed, and the required surgical prosthesis (drill bone, aneurysmal clip) was ready

In 1% all the members of the team were not aware of the patient's allergies.

Only in 1% procedure and site was not mentioned in the wrist band

In 4% airway difficulty or aspiration risk was not ascertained.

In 45% surgery, Video-laryngoscope was not available.

In (100%) none of the patients had compression stocking in site, patients were not diagnosed with increased ICP, and intra-op neuro monitoring tools were not available.

Time-out: In 29% surgeries, operation site was not confirmed.

In 30% each team member did not introduce themselves.

In 26% surgeries-Anticipated blood loss and the duration of surgery was not discussed.

In 22% - anticipated critical events were not discussed and also the nurse did not address any equipment issues.

In 4% warmer was not kept and prophylactic antibiotic was not given 60mins before surgery

In all the surgeries (100%) radiological images were available.

Sign-out: In 19% surgeries- point of care investigations was not done

Only 25% patients required post-op mechanical ventilation and ICU bed was arranged.

In 21% surgeries- concern for post-op recovery was not

communicated

22% surgeries debriefing with all the team members was not done and only 3% surgeries had equipment issues.

In all the 100% operation was performed and recorded, specimens were correctly labelled and instrument/mop count was done.

DISCUSSION:

Checklists were found to enhance the safety culture in the OT by promoting teamwork and communication. They have been demonstrated to improve safety and efficacy in delivery of anaesthesia. We believed that organizing typical neuroanaesthetic concerns into a checklist could prove beneficial for residents, decrease missed items that would have to be retrieved later in the case, and improve patient safety by reducing common mistakes.

In most of the studies conducted, the general perception about checklist was that it was found to be tedious and in some cases also a waste of time, hence this lead the surgeons, anaesthetist and nurses not adhering to the checklist. Multiple barriers were found with the routine SSC, these were lack of time, excess workload, redundancy in the system, poor communication and hierarchical structure within surgical teams, and lack of a clearly identified profession responsible for the checklist have all been noted to affect the quality of the SSC.

Despite the drawbacks, following the routine checklist also has its own advantages like the reduction in the rates of death and complications suggested that the checklist program can improve the safety of surgical patients in diverse clinical and economic environments. Confirmation of prophylactic dose of antibiotic can reduce the rate of post-op surgical site infection rates, attachment of neuro specific monitors and being better equipped in view of difficult airway can reduce the overall mortality of the patients. Intra-op and post-op discussion about the unanticipated events, routine steps, blood-loss, counts of the mop/sponge will help in addressing the recovery concerns of the patients and also in avoiding unnecessary complications.

Till date, the world of neurosurgical experience with checklists is quite limited compared to other areas of surgery.[9] Moreover, the aim of the original WHO SSC was not to prescribe a single universal approach, but to ensure that essential safety elements were incorporated into the Operating room routine.[10]

CONCLUSION:

We concluded that a check-list based program can reduce a lot of complications in neurosurgeries. A tag labelling the site of surgery and diagnosis should be incorporated into routine pre-op checklist. Intra-op teamwork and communication regarding the introduction of team members, equipment concerns, discussing critical or eventful steps intra-operatively and post-operatively can play a pivotal role in preventing and handling of complications. Neuromonitoring like electromyogram, BIS can further help in detection of raised ICP features. Hence the implementation of a checklist can rectify anaesthetics and surgical facets without increasing the duration of surgery.

REFERENCES:

1) Westman M, Takala R, Rahl M, Ikonen T- The need for Surgical Safety Checklist In neurosurgery now and in the future- A Systematic Review.World of neurosurgery. 2020, 134: 614-628.
2) Suresh V, Ushakumari PR, Pillai CM,Kutty RK, Prabhakar RB, Peethambaran A. Implementation andadherence to a speciality-specific checklist for neurosurgery and itsinfluence on patient safety. Indian J Anaesth 2021;65:108-14.
3) De Jager E, McKenna C, Bartlett L, Gunnarsson R, Ho YH. Postoperative adverse events inconsistently improved by the World Health Organization Surgical Safety Checklist: a systematic literature review of 25 studies. World J Surg. 2016;40:1842-1858.
4) Adeleye AO. The need for safety checklists in operative neurosurgery. World Neurosurg 2020;134:190-2.
5) Pearse RM, Moreno RP, Bauer P, Pelosi P, Metnitz P, Spies C,*et al*. Mortality after surgery in Europe: A 7 day cohort study. Lancet 2012;380:1059-65.
6) Miskovic A, Lumb AB. Postoperative pulmonary complications. Br J Anaesth 2017;118:317-34.
7) Haynes AB, Weiser TG, Berry WR, Lipsitz SR, Breizat AH, Dellinger EP, *et al*. A surgical safety checklist to reduce morbidity and mortality in a global population. N Engl J Med 2009;360:491-9.
8) Mahmood T, Mylopoulos M, Bagli D, Damignani R, Haji FA. A mixed methods study of challenges in the implementation and use of the surgical safety checklist. Surgery. 2019 1;165:832-7.
9) McConnell DJ, Fargen KM, Mocco J. Surgical checklists: A detailed review of their emergence, development, and relevance to neurosurgical practice. Surg Neurol Int 2012;3:2.
10) Patel J, Ahmed K, Guru KA, Khan F, Marsh H, Shamim Khan M, *et al*. An overview of the use and implementation of checklists in surgical specialities-a systematic review. Int J Surg.2014;12:1317-23.