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The Anesthesia Techniques for Reductions Intraoperative and Postoperative Complication and Post-Operative Morbidity and Mortality of Stroke Patients

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Abstract **Original Research Article**

Background: Stroke during surgery is the most dreaded complication for both the patient and the medical team. Stroke risk during surgery reportedly varies across procedures. In minor, non-neurologic, and non-cardiac surgeries, its occurrence is typically low. ***Objective:*** In this study our main objective is to evaluate anesthesia techniques for reductions intraoperative and postoperative complication and post-operative morbidity and mortality of stroke patients in ICU. ***Method:*** This Retrospective study was carried out at the Department of surgery, Khulna Medical College Hospital, Khulna from January 2020 to January 2021 where 100 patients who underwent different types of surgery were randomized to receive thoracic epidural analgesia along with general anaesthesia in Group-A (50 patients) and only GA in Group-B (50 patients) were included the study. ***Result:*** During the study, most of the patients belong to 41-50 years age group for both Group A (48%) and group B (42%). Most of the patients in group A faced cardiac surgery, 50% and in group B most of the patients faced neurologic surgery before stroke, 50%. In group A 80% patients had ischemic and 20% had hemorrhagic. Whereas in group B 85% patients had ischemic and 15% had hemorrhagic. Plus, in group A total 90% patients stay in hospital 6-10 days where as group B it was 15%. Moreover, in group A mortality rate was 20% where as in group B it was 25%. ***Conclusion:*** Our findings suggest that combining TEA and GA during surgery reduces the risk of stroke for patients to a similar extent as GA alone. Even more research is required for a more favorable result.

Keyword: thoracic epidural analgesia, general anesthesia, stroke.

INTRODUCTION

In internationally developed nations coronary heart disease and stroke are the leading and second principal cause of mortality proportionately among adult men and women. In 2019, cardiovascular illnesses were responsible for 17.5 million fatalities or 3 out of every 10 deaths worldwide. Ischemic heart disease accounted for 7.4 million deaths and stroke for another 6.7 million.

Though, the burden of stroke in poorer nations has been growing considerably. Stroke is the third leading cause of mortality worldwide, and it is two times more common in poor nations than in industrialized ones. Stroke is usually the second or third leading cause of death in third world nations. In emerging nations, stroke is expected to become a leading cause of death by 2020. Stroke mortality rates for those aged 65 and over have dropped by 23% over the last decade in wealthy nations, but they remain elevated in developing nations. The life expectancy of people in underdeveloped nations like Bangladesh has risen dramatically during the last decade [1-4].

The third largest cause of mortality (8.57%) in Bangladesh is troke. There are two types of strokes, with ischemia accounting for 70-80% and hemorrhagic for the remaining 20-30%. During the operation now a day over the usage general anesthetic alone, thoracic epidural analgesia combinely employed [5-7].

The primary purpose of this research was to assess the efficacy of different anesthetic methods in reducing stroke patients' ICU mortality and complications during and after surgery.

OBJECTIVE

The goal of this study is to provide an assessment of the efficacy of anesthetic approaches in reducing stroke ICU patients' risk of complications during and after surgery.

METHODOLOGY

Involving a cross-section of patients at a tertiary hospital, this research was conducted at department of Surgery and neurosurgery, Khulna Medical College Hospital, Khulna from January 2020 to January 2021. Group-A (50 patients) received thoracic epidural analgesia in addition to general anesthesia (GA), whereas Group-B (50 patients) received just GA for their various surgical procedures (50 patients). Immediately upon entering the operating room, both groups will have intravenous cannulation and radial arterial catheterization placed to begin direct monitoring of blood pressure. Preoperative evaluation and anesthesia records made by the appropriate authority were also kept as required by hospital regulation. People who have Exclusion criteria included patients with valvular heart disease, congenital cardiac abnormality, the need for immediate CABG or re-exploration, or any other systemic (e.g., hepatic, renal, COPD-related) condition.

During the study, we took careful notes on the participants' ages, sexes, species, and behavioral patterns. Anaesthesia details including general, regional, or combined (general & regional), as well as premedication, fasting, and routine investigations like CBC, platelet count, electrolytes, serum glucose, BUN, serum creatinine, PT, APTT, INR, liver function tests, urinanalysis, ECG, chest radiograph, 2D Echocardiogram, 24-hour holter monitoring, coronary angiogram, sedation, monitoring, and outcome were also reviewed.

For each of seven separate tests, the findings are presented as a Mean SD. The degree of significance was determined using the unpaired student's t-test. A statistically significant p-value was defined as less than 0.05. When comparing more than two groups, an ANOVA test was employed to determine statistical significance, and a p value of less than 0.05 was regarded to be significant.

RESULTS

In table-1 shows age distributions of the patients where most of the patients belong to 41-50 years age group for both Group A (48%) and group B (42%). The following table is given below in detail:

Table-1: Age distributions of the patients

Group	Group A %	Group B %
31-40	7%	6%
41-50	48%	42%
51-60	35%	37%
>60	10%	15%

In figure-1 shows gender distributions of the patients. This study patient was divided into Group A and Group B, where in Group A(thoracic epidural analgesia along with general anaesthesia) 80% were male and 20% were female. In Group B (only general anaesthesia) 90% and 10% were male and female respectively. The following figure is given below in detail:

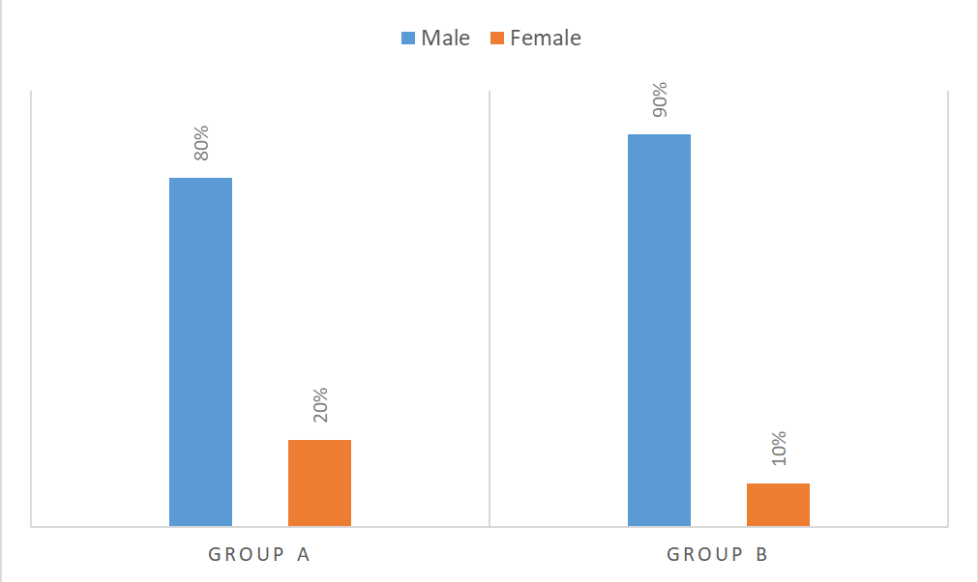

Figure-1: Gender distributions of the patients

In table-2 shows socio demographic characteristics of the patients where, in group A 60% patients were diabetic where as in group B it was 71%. In addition, mean weight of group A 69±9.0kg whereas in group B 62±9.1kg.

The following table is given below in detail:

Table-2: Socio demographic characteristics of the patients

Variable	Group A	Group B
Weight	69±9.0	62±9.1
Height	173±6.0	172±5.0
Educational Status		
Illiterate	6%	1%
Primary	12%	19%
Secondary	23%	21%
Graduate	59%	60%
Working status:		
Service holder	32%	28%
Business Man	15%	11%
House wife	27%	25%
Others	26%	36%
Diabetic status of the patients:		
Diabetic:	60%	71%
Non-diabetic:	40%	29%
Operation status:		
Elective	65%	52%
Emergency	35%	48%

In table-3 shows intraoperative complication in the patients where 15% patients in group A faced lung trauma where as in group B it was 23%. The following table is given below in detail:

Table-3: Intraoperative complication in the patients

Intraoperative complication	Group A	Group B
Pain	10%	12%
Reduced cardiac output	3%	12%
Lung trauma	15%	23%
Renal perfusion with spontaneous respiration.	9%	5%

In table-4 shows types of surgery undergoes the patients before stroke where most of the patients in group A faced cardiac surgery, 50% and in group B most of the patients faced neurologic surgery before stroke, 50%. The following table is given below in detail:

Table-4: Types of surgery undergoes the patients before stroke

Types of surgery undergoes the patients before stroke	Group A	Group B
General	3%	5
Orthopedic	9%	18%
Cardiac	50%	22%
Vascular	20%	6%
Neuropathy	18%	50%

In figure-2 shows distribution of the patients according to types of stroke, where in group A 80% patients had ischemic and 20% had hemorrhagic. Whereas in group B 85% patients had ischemic and 15% had hemorrhagic.

The following figure is given below in detail:

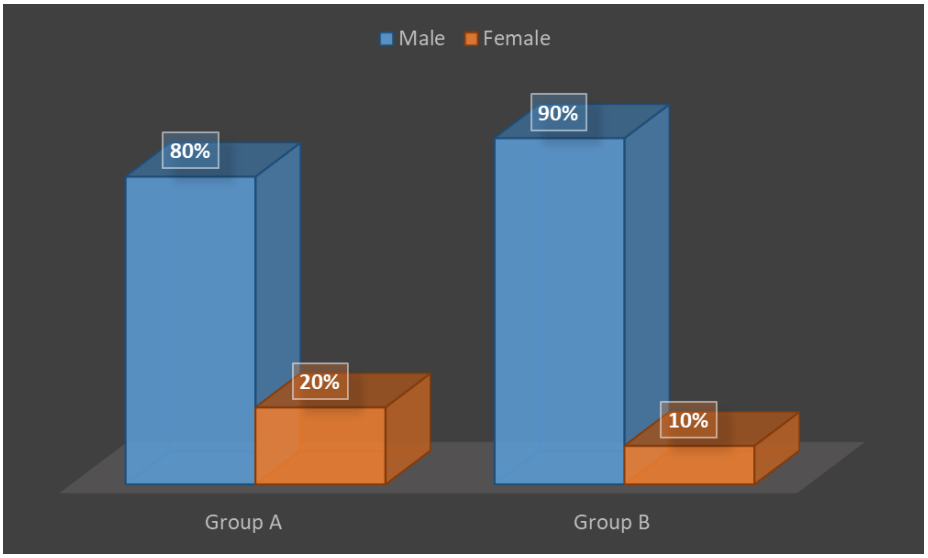

Figure-2: Distribution of the patients according to types of stroke

In table-5 shows total operation time in study population where total operation time in Group-A was 295.0±19.0 minutes and in Group-B was 285.5±16.6 minutes. The following table is given below in detail:

Table-5: Total operation time in study population

Operation time	Group A	Group B
Mean±SD	295.0±19.0 minutes	285.5±16.6 minutes

In figure-3 shows total ventilation time 6-12 hours in 85% Group-A and in group-B it was 89% respectively which was statistical significant ($p<0.05$).The figure is given below:

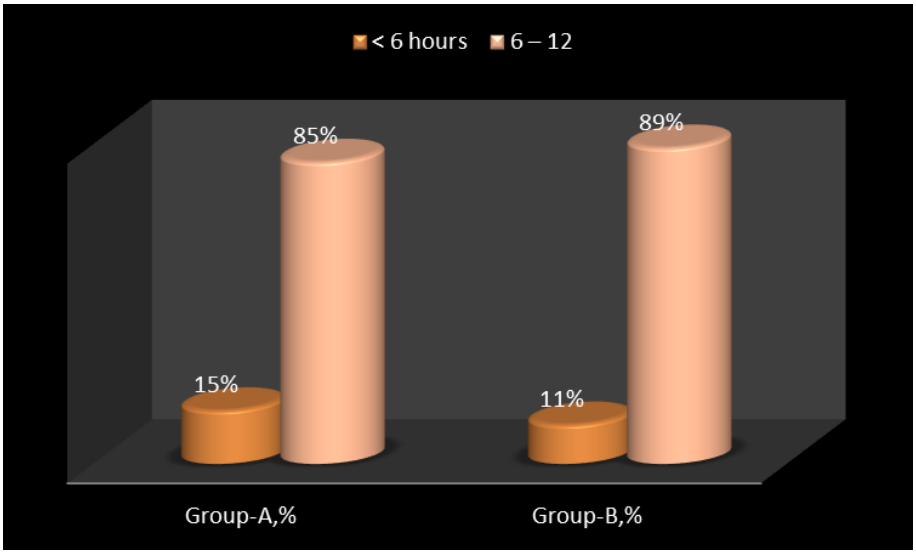

Figure-3: Total ventilation time

In figure-4 shows total ICU Stay in hours of study population where 89% of Group-A patients stay in ICU for 39- 48hours whereas Group B it was 14% .the following figure is given below in detail:

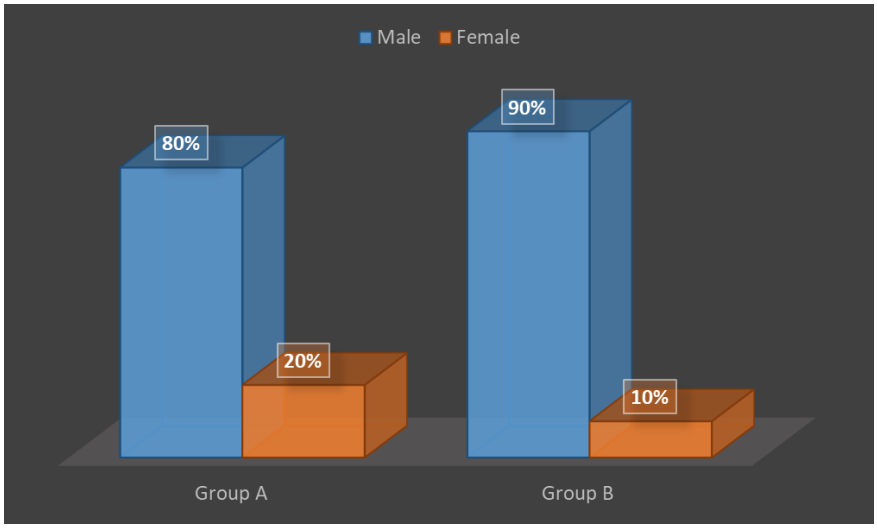

Figure-4: Total ICU Stay in hours of study population

In table-6 shows X-ray chest P/A view of both groups of patients in preoperative period and was found not statistically significant. But on the postoperative follow-up periods there were significant difference found in both groups of patients. The following table is given below in detail:

Table-6: X-ray chest P/A view of both groups of patients in preoperative period

X-ray chest P/A view	Group A	Group B
Pre Op. CXR (Normal)	32	31
Post-operative follow-up CXR Normal	25	23
Abnormal	3	6

In table-7 shows total hospital Stay in Days in study population where in group A total 90% patients stay in hospital 6-10 days where as group B it was 15%. The following table is given below in detail:

Table-7: Total Hospital Stay in Days

Total hospital stay	Group A	Group B
6-10 days	90%	15%
11-15 days	10%	85%

In figure-5 shows mortality and morbidity rate of the patients where in group A mortality rate was 20% where as in group B it was 25%. The following figure is given below in detail:

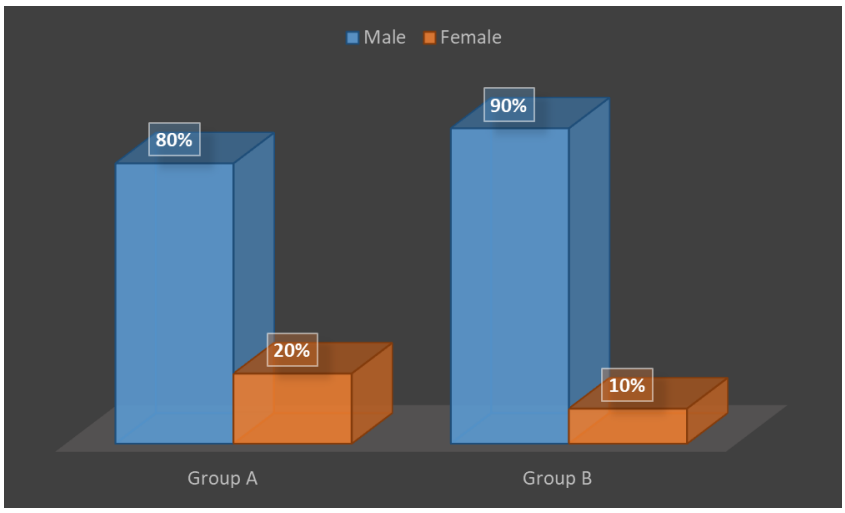

Figure-6: Mortality and morbidity rate of the patients

DISCUSSION

Most of the patients belong to 41-50 years age group for both Group A (48%) and group B (4%). There is no significance difference in age among groups. Similar type of several studies was done by other investigators [6-9].

Regarding distribution of gender among the patients, in Group A (thoracic epidural analgesia along with general anaesthesia) 80% were male and 20% were female. In Group B (only general anaesthesia) 90% and 10% were male and female respectively. Other studies also support this result [7, 8].

During the study total operation time in Group-A was 295.0±19.0 minutes and in Group-B were 285.5±16.6 minutes.

There was no statistically significant differences between two groups were observed. Study done by one article supports this result [6].

The total ventilation time was observed in hours in both groups of patients. Total ventilation time 6-12 hours in 85% Group-Aand in group-B it was 89% respectively which was statistical significant ($p<0.05$. Studydone by many article supported this study [7, 8].

89% of Group-A patients stays in ICU for 39-48 hours whereas Group B it was 14% in statistical analysis there was significant difference was found in two groups in respect to ICU stay in hours.

In group A total 90% patients stay in hospital 6-10 days where as group B it was 15%. There was found statistically significant differences in respect to hospital stays in two groups.

In several reports said that, during the perioperative period after excluding matched pairs where cases and/or controls had surgical procedures (cardiac, neurologic, and vascular surgeries) at high risk for ischemic stroke [9-13.

Which supported our results, where we noted that, in group A 80% patients had ischemic and 20% had hemorrhagic. Whereas in group B 85% patients had ischemic and 15% had hemorrhagic.

CONCLUSION

When compared to general anesthetic alone, the use of TEA during surgery significantly lowers the risk of a patient developing a stroke. Even more research is required for a more favorable result. Optimal analgesia and decreased need for intraoperative anesthesia are achieved with the combination of a spinal or epidural anesthetic and a rapid sequence intubation.

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