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Need of Conscious Sedation or General Anesthesia during Neuro-Interventional Procedures

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Abstract
Background: *There is always a debate regarding the type of anesthesia required in patients undergoing neuroendovascular procedures. The present study determined the prognosis of patients converted from conscious sedation to general anesthesia during neuro- interventional procedures.*
Materials & Methods: *It included 520 patients undergoing neuro -endovascular procedures. History of hypertension, dyslipidemia, diabetes mellitus, cigarette smoking, atrial fibrillation, and coronary artery disease was obtained. Outcome of general anesthesia and conscious sedation was obtained.*
Results: *Out of 520 patients, males were 340 and females were 180. The difference was significant (P-0.01). Out of 520 procedures on patients, 300 were started under conscious sedation and 220 under general anesthesia. 10 were shifted from conscious sedation to general anesthesia (GA). Most common procedure performed under GA was endovascular treatment of cerebral vasospasm (55) followed by embolization of ruptured aneurysm (50), endovascular treatment of acute ischemic stroke (48), embolization of AVM/epistaxis (45). Most common procedure performed under conscious sedation was embolization of ruptured aneurysm followed by embolization of AVM/epistaxis and endovascular treatment of cerebral vasospasm. The difference was significant (P-0.02). Most commonly seen pathology was hypertension, hyperlipidemia, diabetes mellitus, stroke, congestive heart failure, coronary artery disease and atrial fibrillation. The difference was significant (P-0.05). Reasons for conscious sedation failure was vomiting in 6 cases, movement in 3 cases and re ruptured aneurysm in 1 case. The difference was significant (P-0.01).*
Conclusion: *The choice of anesthesia is based on type of procedure to be performed. The failure rate of conscious sedation is relatively low. Neuro endovascular procedures can be performed under conscious sedation with care.*
Keywords: *Conscious sedation, General anesthesia, Neuro endovascular.*

Introduction

There are numerous anesthesias available to us. The choice of anesthesia depends upon type of procedure performed, age of the patient, duration of procedure etc. There is always a debate regarding the type of anesthesia required in patients undergoing neuroendovascular procedures. Conscious sedation utilizes local anesthesia and intravenous sedation and can be effectively used in short duration procedures. Few suggest use of general anesthesia in most of the procedures. under. A study advised that for anterior circulation stroke with the patient under general anesthesia varied widely among centers,

ranging from 0% to 100%, with the average being 44%. Another study suggests that large majority of neurointerventionalists prefer general anesthesia as the intraprocedural technique of choice.[1]

It has been observed that certain modalities of sedation may prolong the hospital stay and worsen outcome. Few factors such as personal preference, experience, and institutional protocols decides the selection of the anesthetic agents.[2] It has been seen that concern for increased risk of aspiration and potential airway injury with emergent intubation in a procedure initiated with conscious sedation, especially if thrombolytic therapy or anticoagulation has been used, may bias operators toward general anesthesia at the onset of the procedure. There are different opinions among different anesthetists regarding selection of a specific agent.[3] The present study determined the prognosis of patients converted from conscious sedation to general anesthesia during neuro-interventional procedures.

Materials & Methods

The present study was conducted in the department of Anesthesia. It included 520 patients of both genders undergoing neuro -endovascular procedures. All were informed regarding the study and written consent was obtained. Ethical clearance was taken from institutional ethical committee.

General information such as name, age, gender etc was recorded in case history performa. History of hypertension, dyslipidemia, diabetes mellitus, cigarette smoking, atrial fibrillation, and coronary artery disease was obtained. Results were subjected to statistical analysis using chi- square test. P value less than 0.05 was considered significant.

Results

Table I Distribution of patients

Total- 520		
Males	Females	P value
340	180	0.01

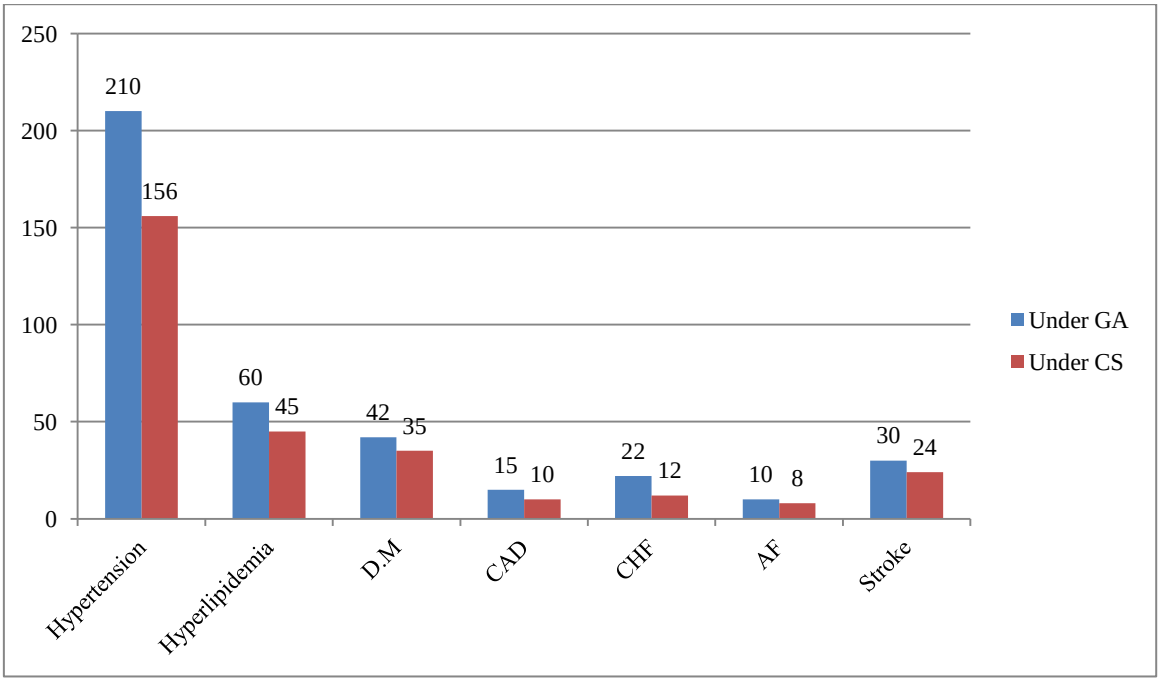
Table I shows that out of 520 patients, males were 340 and females were 180. The difference was significant (P-0.01).

Table II Different endo-vascular procedures depending upon type of anesthesia

Variables	Procedures started under GA	Procedures started under conscious sedation	Failure of conscious sedation
Number	220	300	10
Endovascular treatment of cerebral vasospasm	55	52	2
Intracranial angioplasty and/or stent placement	8	45	1
Extracranial carotid artery stent placement	6	10	1
Embolization of ruptured aneurysm	50	60	2
Embolization of unruptured aneurysm	7	23	1
Endovascular treatment of acute ischemic stroke	48	50	2
Embolization of AVM/epistaxis	45	60	1

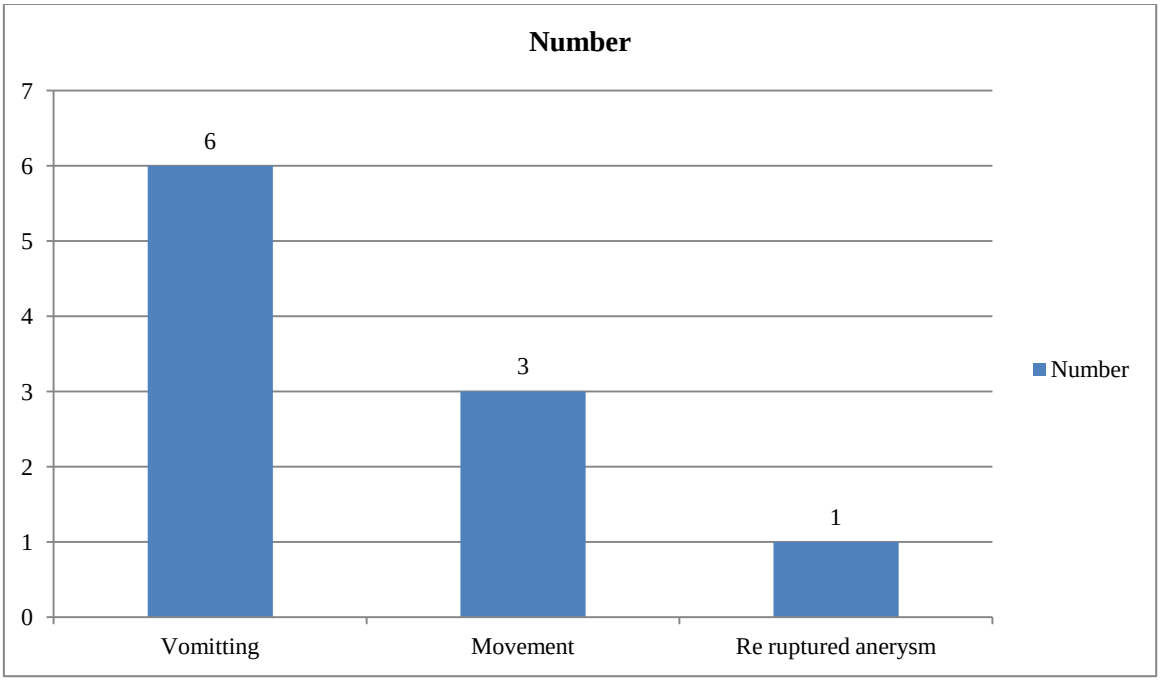
Table II shows that out of 520 procedures on patients, 300 were started under conscious sedation and 220 under general anesthesia. 10 were shifted from conscious sedation to general anesthesia (GA). Most common procedure performed under GA was endovascular treatment of cerebral vasospasm (55) followed by embolization of ruptured aneurysm (50), endovascular treatment of acute ischemic stroke (48), embolization of AVM/epistaxis (45). Most common procedure performed under conscious sedation was embolization of ruptured aneurysm followed by embolization of AVM/epistaxis and endovascular treatment of cerebral vasospasm. The difference was significant (P-0.02).

Graph I Medical status of patients



Graph I shows that most commonly seen pathology was hypertension (under GA-210, under CS- 156) followed by hyperlipidemia (under GA-60, under CS- 45), diabetes mellitus (under GA-42, under CS- 35), stroke (under GA-30, under CS- 24), congestive heart failure (under GA-22, under CS- 12), coronary artery disease (under GA-15, under CS- 10) and atrial fibrillation (under GA-10, under CS- 8). The difference was significant (P-0.05).

Graph II Patients with conscious sedation failure requiring emergent intubation during neuroendovascular procedures



Graph II shows that reasons for conscious sedation failure was vomiting in 6 cases, movement in 3 cases and re ruptured aneurysm in 1 case. The difference was significant (P-0.01).

Discussion

The preference of anesthetic agents depends on many factors. Among all, the choice of the doctor also plays a important role in this regard. Many neurointerventionalists are reluctant to treat patients under conscious sedation, especially due to the potential risk of airway damage and aspiration from an emergent intubation. This reason was rated by 43% of interventionalists as the most concerning complication in a survey involving 49 physicians nationwide.[4] The present study determined the prognosis of patients converted from conscious sedation to general anesthesia during neuro- interventional procedures.

In this study, out of 520 patients, males were 340 and females were 180. We found that out of 300 patients started under conscious sedation, 10 were shifted to general anesthesia (GA). Most common procedure performed under GA was endovascular treatment of cerebral vasospasm followed by embolization of ruptured aneurysm, endovascular treatment of acute ischemic stroke, embolization of AVM/epistaxis. Most common procedure performed under conscious sedation was embolization of ruptured aneurysm followed by embolization of AVM/epistaxis and endovascular treatment of cerebral vasospasm. This is similar to Chamzuk et al.[5]

We found that most commonly seen pathology was hypertension, hyperlipidemia, diabetes mellitus, stroke, congestive heart failure, coronary artery disease and atrial fibrillation. This is in accordance to Abou et al.[6] Reasons for conscious sedation failure was vomiting, movement and re ruptured aneurysm. This is in agreement with Mori T et al.[7]

We found that 3.4% of patients needed emergent conversion from conscious sedation to general anesthesia. Emergent conversion to general anesthesia was not associated with worse outcomes than those observed in planned general anesthesia. This is similar to Ramee et al.[8] Few anesthetists prefer to use conscious sedation as they help in reduction of hospital cost by avoiding use of general anesthesia. In addition to the procedural costs of anesthetic agents, anesthesia personnel, and mechanical ventilation, considerable expenses can be avoided with reduction of hospital and ICU stays.

Neuro endovascular procedures such as revascularization after ischemic stroke or technically successful aneurysm embolization do not necessarily correlate with good outcome. The advantage of realtime input from the patient and the clinical examination outweigh the risk of complications from patient mobility.[9]

Other potential disadvantages of performing these procedures with the patient under general anesthesia include induction-related hypotension, delay in procedure initiation, the need for additional personnel and equipment in the angiography suite, and inherent delay in obtaining a postoperative neurologic examination.[10]

Conclusion

The choice of anesthesia is based on type of procedure to be performed. The failure rate of conscious sedation is relatively low. Neuro endovascular procedures can be performed under conscious sedation with care.

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