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Original Research Article

Surgical anaesthesia: A study onutilization, risk factors, and complications

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Abstract

Background: Anesthesia is a medical intervention that prevents patients from feeling pain during procedures like surgery, certain screening and diagnostic tests, tissue sample removal (e.g., skin biopsies), and dental work.
Materials and Methods: A cross-sectional study was performed on the in-patients. All in patients undergoing surgeries under anesthesia were reviewed before and after the procedure. Patient data including demographics, chief complaints, and past medical, medication, family, and social histories, surgical methods, types of anesthesia etc, were collected. The collected data was recorded in a patient profile form and anesthesia evaluation form.
Results: Among 300 patients, there were (61.7%) male and (38.3%) female. The largest group was between the ages of 38 and 48, with 74 patients. The most typical length of hospital stays encompassing 139 cases (46.3%) was 6–10 days. The most commonly used anesthesia was subarachnoid block (SAB) in 147 patients (49.0%), followed by general anesthesia (GA) in 110 patients (36.7%). The most frequent complication was hypotension caused by SAB in 28 patients. Followed by bronchospasm and laryngospasm in 17 patients where GA was administered. An increased incidence of hypotension in 20 patients and bronchospasm and laryngospasm in 18 patients was observed in the supine position.
Conclusion: SAB was most commonly used in this study, which had a greater incidence of hypotension, which was conservatively managed by ephedrine. Followed by GA, where broncho and laryngospasm were assessed pre-anesthetically by neb. Duolin and Budecort.

Keywords: Anesthesia, GA, SAB, Hypotension, Ephedrine, Bronchospasm, Laryngospasm

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1. Introduction

Anesthesia is a medical intervention that prevents patients from feeling pain during procedures like surgery, certain screening and diagnostic tests, tissue sample removal (e.g., skin biopsies), and dental work. Depending on the type of pain relief needed, anesthesiologists can deliver anesthetics through several methods: • Gas that the patient inhales through a mask covering the mouth and nose • Intravenous line with a needle inserted into a vein, giving direct access to the bloodstream • Catheter (thin tube) inserted into the space outside of the spinal cord or around peripheral nerves • Injection into a body part with a needle and syringe • Topical lotion or spray and eye drops • Skin patch.[1]

2. Types of Anesthesia

1. **General anaesthesia** affects the whole body, making patients unconscious and unable to move. Anesthesiologists will give general anesthesia for complex surgeries involving internal organs or other invasive or time- consuming procedures, such as back surgery. These anesthetics are given either through an intravenous line or as an inhaled gas.[1]
2. **Monitored sedation** is like general anesthesia in that it relaxes the body and may induce sleep. In monitored sedation, patients are still conscious and may even be able to talk, depending on the level of sedation needed. This form of anesthesia is often combined with pain relief for procedures such as a colonoscopy or complex dental work.[1]

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3. **Regional anesthesia** numbs pain and sensation to only the part of the body that needs it, such as an arm, a leg, or everything below the waist. This type of anesthesia is used in hand and joint surgeries and C-section deliveries, as well as to ease the pain of childbirth.[1]

>Types of regional anesthesia

2.1. Neuraxial blocks

Itconsists of placing a needle through the back to specific drug in to the subarachanoid space for spinal anesthesia or in the epidural space for epidural anesthesia.

1. **Epidural anesthesia**: It is administered by introducing a needle between theLumbar, thoracic or cervical vertebrae and injecting the anesthetic agents into the epidural space directly or through catheter.

2. **Spinal anesthesia**: To perform a spinal block, a local anesthesia is injected into cerebrospinal fluid in the lumbar spine to numb the nerves that exit the spinal cord.

2.2. Peripheral nerve blocks

They are particularly used for surgical procedures involving the lower or upper extremities and nonsurgical anesthesia.

Local anesthesia affects only a small part of the body. For example, this type of anaesthetic is used to block pain in a single tooth during a dental procedure. Local anesthetics are commonly given as an injection, topical lotion or spray, eye drops, or skin patch.[1]

3. Side Effects and Its Management

3.1. General anesthesia

1. **Nausea and vomiting-** it is a common side effect that can occur within the first few hours or days after surgery and can be triggered by a number of factors such as medication, motion, and the type of surgery. It is treated using anti emetics.
2. **Sore throat**- it is mainly caused due to insertion of intubation tube in to the throat. Spraying beclomethasone and lidocaine on the endotracheal tube is a simple and effective method to reduce post-operative sore throat.
3. **Postoperative delirium**- the patient may feel disoriented and have problems remembering or focusing. Haloperidol can be administered orally, IM and IV.
4. **Chills and shivering (hypothermia)** - this occurs in up to half of the patients as the regain consciousness after surgery, and it might be related to body temperature. Active cutaneous warming (electric heating, water circulating garments, forced air, radiant heating) is effective in this case.[2]

3.2. Local Anesthesia

1. **Dizziness**- Drink plenty of fluids. Dehydration is the most common cause of these symptoms
2. **Twitching muscle or shivering** – warm up the body

Continuing numbness, weakness or pins and needles

Allergic reaction.[3]

3.3. Regional Anesthesia

1. **Numbness and weakness** - responsible adult should stay with the patient
2. **Drowsiness** – Drink plenty of fluids. Dehydration is the most common cause of these symptoms
3. **Pain** - Take pain medications as prescribed by physician.[4]

4. Complications

1. **General Anesthesia**- Damage to teethLacerations (cuts) to the lips, tongue, gums, and throatNerve injury secondary to body positioning, Awareness under anesthesia, cardiac arrest, Death are some of its complication.
2. **Regional anesthesia** (spinal and epidural anesthesia)- Pain, Post-dural-puncture headache, Hypotension and bradycardia secondary to sympathetic blockade, Hypothermia, Nerve or spinal cord damage, possibly resulting in paralysis are some its complications.

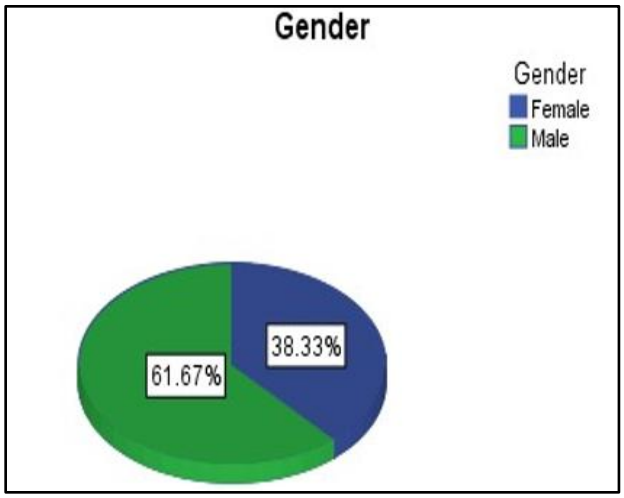

Figure 1: Gender distribution

4.1. Local anesthesia

Risk of bleeding**,** Nerve damage**,** Hematoma are some of its complications.[5]

5. Materials and Methods

5.1. Sources of data and materials

1. Patient case records
2. Self-designed patient profile form
3. Patient Medication Chart

4. Preanesthetic evaluation form

5.2. Method of data collection

We performed a cross sectional study. All in patients undergoing surgery with anesthesia were reviewed both before and after the procedure. Patient data, including demographics, chief complaints, and past medical, medication, family, and social histories, were collected. Additionally, laboratory and non-laboratory investigations, the pre-anesthetic evaluation form, proposed drug therapies, and details on patient progress were gathered. This information was sourced from patient case profiles, doctor's notes, and medication charts. The collected data was recorded in a patient profile form.

5.3. Statistical analysis

Data were collected and entered into Microsoft Excel 2019 software and interpreted with descriptive statistics which then provided for analysis of the report and expressed as counts and percentages in the form of tables, charts and graphs. Statistical analysis of the collected data was done using IBM SPSS version 26 statistical software.

6. Ethical Consideration

The consent of the participants has been obtained in the form of informed consent forms from all the participants after explaining the procedures involved in the study. Confidentiality is maintained throughout the research. No Participants have been physically or mentally harmed during the study.

6.1. Ethical clearance

Ethical approval for the study was judiciously secured from the esteemed ethics committee of the study site. The research was carried out by utilizing officially sanctioned surveillance data for the purpose of analysis.

3. Results

3.1 Patient gender distribution

The gender distribution of a sample of 300 patients is displayed in the fig no.1. There are 185 (61.7%) male and 115 (38.3%) female in the sample. This suggests that the proportion of male in this group is higher than that of female.

3.2. Age distribution

With 74 (24.7%) patients, the largest group was between the ages of 38 and 48. The age group of 27–37, with 19.0%, and the 49–59 group, at 17.7%, were next. 16.7% were younger patients, aged 16 to 26. The frequency was inversely proportional with the age, reaching low at 5.3% in the 71–81 age group and very less in the later groups. To conclude, middle-aged people are at high risk of getting surgeries for various reasons.

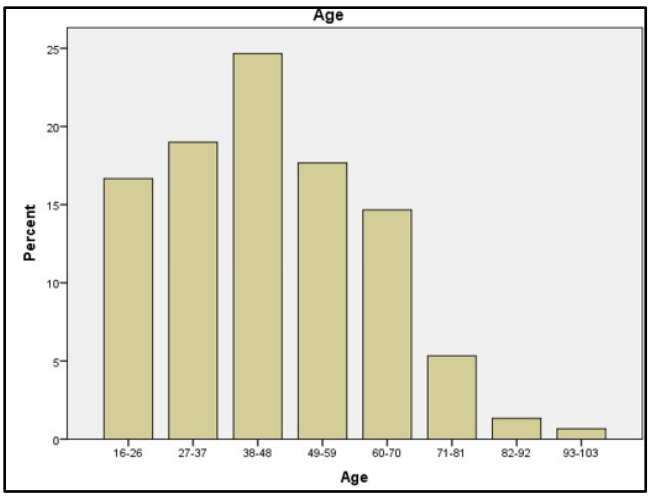

Figure 2: Age distribution

Table 1: Distribution of age

Age	Frequency	Percent	Valid Percent	Cumulative Percent
16-26	50	16.7	16-7	16-7
27-37	57	19.0	19.0	35.7
38-48	74	24.7	24.7	60.3
49-59	53	17.7	17.7	78.0
60.70	44	14.7	14.7	92.7
71-81	16	5.3	5.3	98.0
82-92	4	1.3	1.3	99.3
93-103	2	0.7	0.7	100.0
To	300	100.0	100.0	

Table 2: Comparison of age and gender

		Gender		
		Female	**Male**	**Total**
	16-26	18	32	50
	27-37	26	31	57
	38-48	29	45	74
	49-59	18	35	53
Age				
	60.70	20	24	44
	71-81	4	12	44
	82-92	0	4	4
	93-103	0	2	2
Total		115	185	300

3.2 Distribution of duration of hospitalization

The most typical length, encompassing 139 (46.3%) cases, was 6–10 days. 1–5 day period coming in second with 131 (43.7%) patients. There were 22 (7.3%) patients in the 11–15 day group, compared to relatively few in the 16–20 and 20–25 day groups. Merely two patients describe spending many months in the hospital due to their carcinogenic-related issues.

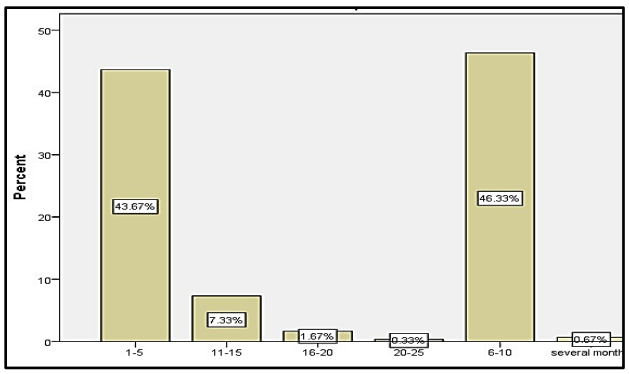

Figure 3: Distribution of duration of hospitalization

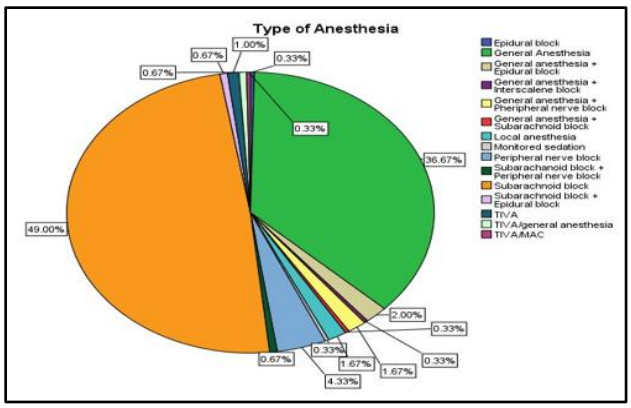

Figure 4: Distribution of types of anesthesia

3.4 Distribution of types of anesthesia

The most commonly used anesthesia was subarachnoid block (SAB) in 147 (49.0%) patients, followed by general anesthesia (GA) in 110 (36.7%) patients and peripheral nerve block (PNB) in 13 (4.3%) patients. Local anesthesia (LA) was given in 5 (1.7%) patients, total intravenous anesthesia (TIVA) in 3 (1%) patients, and both epidural block (EB) and monitored sedation (MAC), each in one patient. GA was mostly used in combination with EB in 6 (2%) patients, then with PNB in 5 (1.7%) patients and with interscalene block (ISB) and SB, each in 1 (0.3%) patient. SAB was used in combination with PNB and EB, each in 2 (0.7%) patients. Initially, they started with TIVA and converted to MAC in 1 (0.3%) patient. Regional anesthesia was used more than general anesthesia, the least being local anesthesia and monitored sedation.

4.5 Comparison of anesthesia selection based on surgery

34 patients had renal calculi removed; among them, 23 were anesthesized with SAB, followed by GA in 9 and combined anesthesia in 2. 32 patients had surgery for fracture; among them 18 were anesthesized with SAB, followed by GA in 8, PNB in 3, and combined anesthesia in 3. 18 patients had debridement surgery; among them 11 were anesthesized with SAB, followed by GA in 2 and monitored sedation in 4. From Table 5, we can conclude that SAB was used primarily in orthopedic and lower abdomen surgeries.GA was used in the surgeries that require deep relaxation for long periods of time and cannot be adequately anesthesized by regional or local anesthesia, like in cases of gallbladder surgery (11), cosmetic surgery (9), etc.GA and SAB were evenly distributed for a few surgeries like appendectomy (1), dilation (1), vaginal surgeries (1), etc. Combined anesthesia was used in cases of knee amputation, anterior rectum resection, etc.PNB was done primarily in cases of debridement and fractures, and it was also utilized in cases of tendon repair (2), K wiring (2), and fistula removal(1). Local anesthesia was used in cases of coronary artery blockage removal (3) (PTCA and bypass surgery), Chemo port insertion (1), incision, and drainage (1). TIVA was used in ERCP (3), EB in duodenectomy (1), and monitored sedation in dilation[1]

Table 3: Comparison of anesthesia selection based on surgery

Count of Type of surgery	**Column Labels**								
Row Labels	**Combined Anesthesia**	**Epidural block**	**General Anesthesia**	**Local anesthesia**	**Monitored sedation**	**Peripheral nerve block**	**Subarachnoid block**	**TIVA**	**Grand Total**
Knee amputation	1						2		3
Anterior rectum resection	1								1
Appendictomy			4				5		9
Arthoplasty							2		2
Breast surgeries	1		2						3

Chemoport insertion				1					1
Colostomy			3				1		4
Coronery artery blockage removal			1	3					4
Cosmetic surgery	1		9						10
Craniotomy			1						1
Debridement			2			4	12		18
Diagnostic laproscopy	1		9						10
Dilation			2		1		2		5
Double valve replacement			1						1
Duodenectomy		1							1
ERCP	2		1					3	6
EVS	1								1
Fasciotomy							4		4
FESS + Septoplasty			9						9
Fistula removal						1	7		8
Fracture reduction + internal fixation + external fixation	3		8			3	18		32
Frey's procedure	1								1
Gall bladder surgery	2		11				5		18
Gastrostomy	1								1
Hemorrhoidectomy							8		8
Hernia repair			3				6		9
Hydrocele							3		3
Ileostomy			1						1
Implant removal							4		4
Incision + drainage			1	1			3		5
K wiring						2	1		3
Renal calculi removal	2		9				23		34
LSCS			3				8		11
Nephrectomy	1								1
Opthalmic surgeries			8						8
Posterior stabilization			1						1
Rectopexy	1								1
Relief of urinary obstruction			3				1		4
Right hip core decompression							1		1
Secondary suturing							1		1
Sphincterotomy							2		2

Spinal Decompression			8			1			9
Split thickness skin grafting			1				12		13
Tendon repair						2			2
Thyroidectomy			6						6
Tonsillectomy			1						1
Tracheostomy			1						1
TURBT	1								1
TURP							10		10
Tympanoplasty			2						2
Vaginal surgeries			2				1		3
Vericose vein clearance							2		2
Grand Total	20	1	110	5	1	13	147	3	300

Table 4: Comparison of complication with type of anesthesia

Type of Anesthesia * Complications Crosstabulation										
Count										
		Complications								**Total**
			Bronchospasm+ Laryngospam	**Chest pain**	**Hypertension**	**Hypotension**	**Hypotension, bronchospasm, laryngospasm**	**Redness of skin over chin and abdomen**	**Sinus tachycardia**	**Tachyarrythmia**	
	Epidural block	1	0	0	0	0	0	0	0	0	1
	General Anesthesia	81	17	0	4	5	1	1	1	1	110
	General anesthesia + Epidural block	3	1	0	2	0	0	0	0	0	6
	General anesthesia + Interscalene block	1	0	0	0	0	0	0	0	0	1
	General anesthesia + Pheripheral nerve block	3	1	0	0	1	0	0	0	0	5
	General anesthesia + Subarachnoid block	0	0	0	0	1	0	0	0	0	1
	Local anesthesia	5	0	0	0	0	0	0	0	0	5
	Monitored sedation	1	0	0	0	0	0	0	0	0	1
	Peripheral nerve block	10	2	0	0	0	0	0	1	0	13
	Subarachanoid block + Peripheral nerve block	2	0	0	0	0	0	0	0	0	2
	Subarachnoid block	114	3	1	1	28	0	0	0	0	147

	Subarachnoid block + Epidural block	2	0	0	0	0	0	0	0	0	2
	TIVA	2	0	0	0	1	0	0	0	0	3
	TIVA/general anesthesia	2	0	0	0	0	0	0	0	0	2
	TIVA/MAC	0	0	0	0	1	0	0	0	0	1
Total		227	24	1	7	37	1	1	1	1	300

Table 5: Comparison of complication with treatment given

Drugs given for complication	**Column Labels**								
Row Labels	**Bronchospasm+ Laryngospam**	**Chest pain**	**Hypertension**	**Hypotension**	**Hypotension, bronchospasm, laryngospasm**	**Redness of skin over chin and abdomen**	**Sinus tachycardia**	**Tachyarrythmia**	**Grand Total**
Duolin + Budecort	24								24
Ephedrine				32					32
Ephedrine , Duolin + Budecort					1				1
Esmolol			4					1	5
Labetolol			2						2
Mephentramine				2					2
Metaprolol tartrate							1		1
Noradrenaline + Dobutamine + Ephidrine				1					1
Pheneramine maleate + Hydrocortisone						1			1
Phenylephrine				1					1
Pyrolol			1						1
Relieved after few minutes		1							1
Grand Total	24	1	7	36	1	1	1	1	72

4.6. Distribution of anesthethetic agents

The most frequently used anesthetic agent as monotherapy was propofol in 56 (18.7%) patients, followed by bupivacaine in 42 (14.0%) patients, SEVO, and ketamine each in 1 (0.3%) patient. Propofol was combined mostly with SEVO in 31 (10.3%) patients, followed with ISO in 14 patients (4.7%) and DES in 1 (0.3%) patient, with ketamine in 9 (3.0%) patients. Bupivacaine was combined with adjuvants like clonidine in 47 (15.7%) patients, fentanyl in 47 (15.7%) patients, and other adjuvants like midazolam, lignocaine, dexamethasone, and adrenaline were used in fewer patients. Bupivacaine and its adjuvant were administered after propofol and/or ketamine, ISO, and SEVO during

combination anesthesia. Etomidate was used less frequently in 2 patients each with ISO (0.3%) and SEVO (0.3%).

4.7. Comparison of complication with type of anesthesia

The most common complication was hypotension caused by SAB in 28 patients, followed by GA combined with PNB on SAB in 1 patient each and TIVA in 3 patients. The second largest was bronchospasm and laryngospasm caused by GA in 17 patients, followed by SAB in 3 patients, and PND in 2 patients. Other complications observed were hypertension in 7 patients, highest with GA (4 patients), chest pain, redness of skin, sinus tachycardia, and tachyarrhythmia, each with 1 patient.

In general, hypotension was more associated with SAB, bronchospasm, and laryngospasm were more associated with GA. Other complications observed were chest pain, redness of skin, sinus tachycardia, and tachyarrhythmia, and these were not frequent.

4.8. Comparison of complication with treatment given

Ephedrine was the most commonly utilized treatment for hypotension (32 patients), followed by mephenteramine (2) and phenylephrine.1 (1). In a severe case, a combination of noradrenaline, dobutamine, and ephedrine was used in 1 patient. Beta blockers such as esmolol were used to treat hypertension in 4, labetalol in 2, and pyrolol in 1 patient. Bronchospam and laryngospasm were preanesthetically assessed, and 24 patients were prophylactically treated with Neb. Budecort and Duolin. Redness of skin (anaphylactic reaction) was treated with pheneramine maleate, sinus tachycardia was treated with metaprololtartarate, and tachyarrythmia with esmolol. Chest pain that occurred in 1 patient was relieved later.

Majority of the patients had hypotension (20 patient) followed by bronchospasm and laryngospasm (18patient) when the patients were in supine position.

4.9. Risk factors

By considering the social habits as risk factors, out of 300 patients, 13 were alchoholics, 13 were smokers, and 10 were bettle nut chewers. The highest number of patients (34) were alcoholics and smokers, and 6 patients were alcoholics and tobacco chewers.

Out of 300 patients who underwent surgery with anesthesia, 91 had several comorbidities. Patients with both Type 2 DM and hypertension were mostly found (23). Follwed by hypertension in 18 patients, and both thyroid disorders and Type 2 DM were in 14 patients each. Gestational DM was in the case of 3 patients, IHD was in the case of 2 patients, and pulmonary TB and epilepsy were identified in 2 patients each. Age-related risk in 2 patients and procedure-related risk in one patient were identified. The most frequent risk factors in the study were hypertension, type 2 DM, and thyroid disorder.

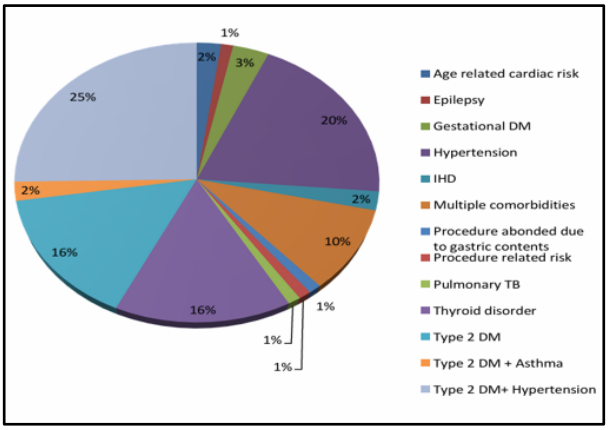

Figure 5: Distribution of comorbidities as a risk factors

7. Discussion

This study explains the method of selection of type anesthesia in different types of surgeries and estimates risk factors and complications associated with anesthesia.

The proportion of male in this study is higher than that of female. This finding is not in accordance with other studies, as in most of the studies, females had more surgeries. As in the study conducted by Prashant Bhandarkar et al.,6[6] the women underwent a greater number of surgeries compared to men in their study.

The study points to a high concentration of patients in the middle age group. This was similar to the study conducted by Prashant Bhandarkar et al.,6[6] which described that within the Indian population, the maximum number of surgeries (N = 688, 18.8%) was estimated to be in the fourth decade (30–39 years), and age groups 30–49 years will need about one-third of the total number of surgeries.

In this study, SAB was mostly used in the case of orthopedic and lower abdomen surgeries, as it decreased hospital stay and minimized postoperative complications. This is in accordance with a study by Swarup Sri Varadayet al.,[7] where he states that spinal anesthesia is a safe and effective alternative to general anesthesia when the surgical site is located on the lower extremities, perineum (e.g., surgery on the genitalia or anus), or lower body wall (e.g., inguinal herniorrhaphy). Cesarean deliveries are routinely performed under spinal anesthesia, as are total hip and knee arthroplasty.

GA was seen primarily utilized in cases of gall bladder surgery, cosmetic surgery, FESS + septoplasty, diagnostic laparoscopy, spinal decompression, thyroidectomy, tympanoplasty, ophthalmic surgeries, and breast surgeries. These are the surgeries that require deep relaxation for long periods of time and cannot be adequately anesthesized by regional or local anesthesia. This can be supported by Guerin Smith et al.'s8[8] article, where the article states that patients undergoing surgical procedures that require deep relaxation for long periods of time are best suited for general anesthesia

as long as there are no contraindications. Surgeries that cannot be adequately anesthetized with local or regional anesthesia require general anesthesia. Operations likely to result in significant blood loss or in which breathing will be affected necessitate general anesthesia. Uncooperative patients are also better treated with general anesthesia, even for more minor procedures. Patient preference can also influence the decision to undergo anesthesia.

Combined anesthesia was used in surgeries for reducing postoperative pain and other complications; this can be supported by the study by Poonam S. Ghodkiet al.,[9] which stated that hemodynamic repercussions during pneumoperitoneum can be effectively attenuated by combining SA with GA without any adverse effects.

Local anesthesia was used in surgeries like coronary artery blockage removal (PTCA and bypass surgery), Chemoport insertion, incision, and drainage. These are the surgeries where a small region has to be numbed. Local anesthesia exhibits this action by blocking nerve impulse transmission in the peripheral and central nervous systems without causing central nervous system depression or altered mental status.[1]

Less usage of epidural anesthesia was observed in the study; this is due to increased risks of adverse effects and serious complications because of its high invasiveness. This is similar to the study by Narinder Rawal et al.,[10] where the study states that "Current evidence shows that the benefits of epidural analgesia (EA) are not as impressive as believed in the past, while the risks of adverse effects and serious complications are greater than previously estimated."

In this study, PNB was used in combination rather than alone because of its addictiveness in combination. This can be supported by the study by Zoya Haitov Ben Zikri, et al.,11[(11)] The results of the study indicated that a combination of peripheral nerve blocks reduced the use of analgesic consumption during the 24 hours after LC surgery compared to standalone blocks.

In general, hypotension was more associated with SAB. This is in compliance with the study by AmritaPandaet al.,[12] where they state that hypotension is common in patients receiving a subarachnoid block (SAB) and can decrease vital organ perfusion, causing increased morbidity and mortality.

Bronchospasm and laryngospasm were more associated with GA. This is similar to the study by Alex Looseley et al.,[13] where the study summarizes that bronchospasm was a relatively common event during general anesthesia.

Other complications observed were chest pain, redness of skin, sinus tachycardia, and tachyarrhythmia. Aegesanesthesia mentioned redness of skin as one of the anesthetic complications due to anaphylactic reactions. Satyen Parida and Chitra Rajeswari Thangaswamy[14] stated that cardiac tachyarrhythmias were encountered commonly during the perioperative period and need to be promptly identified and appropriately managed by the anesthesiologist in their study. A. D. Paix et al.,[15] describe that hypertension is a commonly occurring event during anesthesia.

Yuta Uemura et al.,[16] stated that Ephedrine is a mixed α- and β-agonist vasopressor that is frequently used for the correction of hypotension during general anesthesia. This is similar to our study, where ephedrine was the most commonly utilized treatment for hypotension.

The efficacy of mephenteramine as a treatment for hypotension during anesthesia was described by M. Mohtaet al.,[17] where the study stated that a comparison of ephedrine and mephentermine for the treatment of spinal anesthesia-induced hypotension during a caesarean section found that mephentermine was as safe and effective as ephedrine for maintenance of maternal blood pressure and for fetal outcome.

Bronchospam and laryngospasm were treated prophylactically with Neb. Budecort and Duolin. A critical article review by Alex Looseleyet al.,[13] describes how a pretreatment with an inhaled/nebulized beta agonist 30 minutes prior to surgery reduces the risk of bronchospasm.

Beta blockers such as esmolol, labetalol, and pyrolol were used to treat hypertension. Russell Yancey et al.,[18] described that β-blockers have a variety of pharmacologic and physiologic properties and comprise an effective group of antihypertensive medications that are used to treat not only hypertension but also tachyarrhythmias during anesthesia.

The study on preoperative evaluation and preparation for anesthesia and surgery performed by A Zambouriet al.,[19] stated that the clinician should assess the patient's preoperative risk factors and the risks associated with the planned surgery. It is often helpful to give an estimate of the percentage risk of cardiac complications (see above, by risk class) so that the surgeon can make the most educated decision regarding whether or not to proceed with surgery.

The most frequent risk factors in this study were hypertension, type 2 DM and thyroid disorder, alcoholism, and smoking**.**

Dr. Antonia C. Mayell et al.,[20] stated that hypertensive patients are at risk of greater swings of blood pressure than the normal population, and it has been shown that blood pressure lability can be associated with increased cardiovascular morbidity and mortality postoperatively, particularly in patients with severe uncontrolled hypertension. Optimization of such patients with investigation and drug treatment can improve long-term outcomes and prevent such complications.

A. Farling et al., stated that "There are several reports of severe cardiovascular and respiratory depression in hypothyroid patients during general anesthesia."

Hypothyroidism should therefore be considered in any obese, debilitated patient who displays perioperative cardiovascular or respiratoryinstability, and anesthetic drugs may be affected by the hypermetabolic state of hyperthyroidism.

A Zambouriet al.,[15] explained how aging was often associated with changes in the cardiovascular system, such as decreased elasticity of blood vessels and changes in heart function. Older individuals might be more susceptible to orthostatic hypotension, a drop in blood pressure upon standing, which can be relevant during the postoperative period when patients transition from a supine to an upright position. Ageing can also be associated with a higher risk of gastroesophageal reflux and impaired protective airway reflexes. It might increase the risk of aspiration (inhaling stomach contents into the lungs), so precautions should be taken to minimize this risk.

M.A. Carrick et al., Thomas stated that smoking increases the risk of perioperative morbidity and mortality in a dose-dependent manner. The Royal College of Anaesthetists advises that people who smoke should quit several weeks before surgery and should especially be encouraged not to smoke on the day of an operation.

Felicity Plaatet al., stated that chronic heavy alcohol use is associated with a 2–5-fold increase in postoperative complications, with higher rates of admission to high-dependency or intensive care units and increased length of hospital stay. Depletion of coagulation factors and thrombocytopenia increase the incidence of postoperative bleeding**.**

L. Narendra et al., stated that chewing tobacco plays a modifying role in the malignant transformation of oral submucosal fibrosis. Since OSF can cause unanticipated difficult intubation, betel quid and chewing habits must be routinely asked during preassessment in all adults in Asia and Asian immigrants in the west.

8. Conclusion

By conducting this cross-sectional study with the objective to assess the method of anesthesiaselection based on surgery and to estimate risk factors and complications associated with anesthesia, we can conclude that SAB was mostly used in the case of orthopaedic and lower abdomen surgeries, as it decreased hospital stay and minimized postoperative complications. GA was used in the surgeries that require deep relaxation for long periods of time and cannot be adequately anesthesized by regional or local anesthesia. Combined anesthesia was used in surgeries for reducing postoperative pain and other complications. LA was used in the surgeries where a small region of the body has to be numbed. Less usage of epidural anesthesia was observed in the study due to increased risks of adverse effects and serious complications because of its high invasiveness. PNB was used in combination rather than alone because of its addictiveness in combination.

The complications primarily observed in the study were hypotension, bronchospasm, laryngospasm, and hypertension. Hypotension was more associated with SAB. Bronchospasm and laryngospasm were more associated with GA. The drugs that were used to treat complications were ephedrine and mephenteramine for hypotension. Neb. Budecort and Duolin as a prophylactic for bronchospasm and laryngospasm, and beta blockers such as esmolol, labetalol, and pyrolol were used to treat hypertension.

The most frequent risk factors in this study were hypertension, type 2 DM, thyroid disorder, alcoholism, and smoking.

9. Limitations

1. Limited data regarding peripheral nerve block, epidural nerve block, and local anesthesia limited us from exploring their use in surgeries.
2. There were limited studies regarding the method of selection of anesthesia based on type of surgery.

5 Future Directions

Multi centre studies with large study population for longer duration should be a part of this study's future direction on anesthesia and its selection based on different types of surgery. Research can be done focusing much deeper in developing standardized anesthesia protocols tailored to specific types of surgeries to enhance safety and efficacy. Studying the benefits and limitations of regional anesthesia versus general anesthesia for specific surgeries in terms of pain management and recovery. Also assessing how patients demographics and co-morbidities and preferences influence anesthesia choice and outcomes.

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None.

7 Conflict of Interest

None.

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