

A COMPARITIVE STUDY OF ANESTHETIC EFFECTS IN CESAREAN SECTION

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ABSTRACT

Anesthetics are having a crucial role in most of the therapies but the efficiency lies in selection of route of administration and the type of anesthesia depends on the patient condition. This study explains that the role of anesthetics in cesarean section which has been preferring mostly and gives the immense observation of every parameter based on multipara and nullipara conditions such as Age, height, body mass, blood glucose level before and after cesarean section and co morbid conditions like anemia, gestational diabetes, pre-eclampsia, and

seizures, side effects after the cesarean section by administration. We used *chi-square* test to calculate the *p*-values based on the significant Values we determined which anesthesia is preferable in c-section. With the sources available for this study, we observed that the results and recovery rate for the spinal anesthesia is good than general anesthesia

KEYWORDS: Anesthesia, mean arterial pressure, chi square test, c-section, parameters, comorbid conditions.

INTRODUCTION

Anesthetic also spelled **anesthetic**, any agent that produces a local or general loss of sensation, including pain. Anesthetics achieve this effect by acting on the brain or peripheral nervous system to suppress responses to sensory stimulation. The unresponsive state thus induced is known as anesthesia.

Types of Anestheesia

General anesthetics: bring about a reversible loss of consciousness and analgesia for surgeonsto operate on a patient. Their use is commonplace, but how they produce their effect

is still not fully understood. General anesthesia is, essentially, a medically induced coma, not sleep. Drugs render a patient unresponsive and unconscious.

They are normally administered intravenously (IV) or inhaled. Under general anesthesia, the patient is unable to feel pain and may also have amnesia. Such drugs include propofol, etomidate, isoflurane, benzodiazepines (midazolam, lorazepam, diazepam), and barbiturates (sodium thiopental, methohexital).

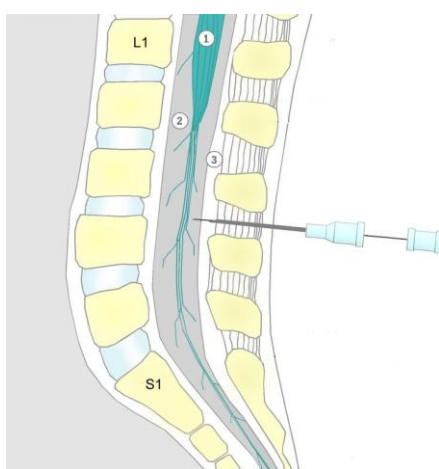
Local anesthetics: A local anesthetic (LA) is a medication that causes absence of pain sensation. In the context of surgery, a local anesthetic creates an absence of pain in a specific location of the body without a loss of consciousness, as opposed to a general anesthetic.

Regional anesthesia

Can either be peripheral nerve blocks, spinal or epidural anesthesia which numb a larger region of the body.

❖ SPINAL ANESTHESIA

This is a type of regional anesthesia which is injected through a tiny needle, right into the cerebrospinal fluid (CSF) which covers and protects the spinal cord. The skin area of insertion will first be made numb using a local anesthetizing agent which will then be followed by the insertion of the needle into the spinal canal. Unlike epidural anesthesia, spinal anesthesia does not involve a catheter and the agent will be directly lead to the necessary region. This will usually numb the area below the site of injection or sometimes above.

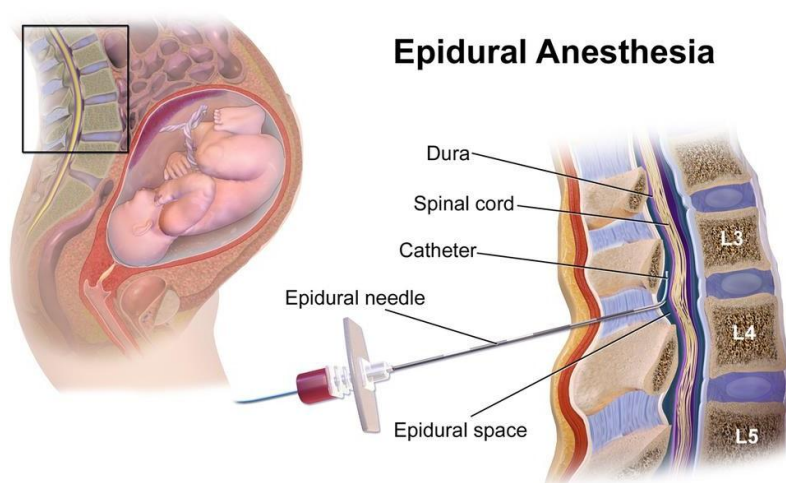


The patient may not be able to move his lower limbs until the effect of the agent is worn off and sometimes will experience a headache following the procedure. This can be treated effectively with a mild analgesic.

❖ Epidural Anesthesia

This is a type of regional anesthesia in which only a certain part of the body of the patient is made numb. The procedure will involve the insertion of a hollow needle along with a tiny and flexible catheter into the epidural space which is defined as a marginal area in between the spinal column and the outer membrane of the spinal cord.

Areas which can be numbed using an epidural include, chest, abdomen, pelvic area, and limbs. Furthermore, epidurals are highly used during childbirth to reach an efficient pain-free delivery.



Pregnancy: occurs when a sperm fertilizes an egg after it's released from the ovary during ovulation. The fertilized egg then travels down into the uterus, where implantation occurs. A successful implantation results in pregnancy. On average, a full-term pregnancy lasts 40 weeks.

Comorbidities During Pregnancy: The prevalence of medical problems in pregnancy is increasing because of a complex interplay between demographic and lifestyle factors, and developments in modern medicine.

✚ Medical Related

✚ Non-Medical Related such as

- ✓ Any diseased conditions
- ✓ Gestational diabetes
- ✓ Gestational HTN
- ✓ Gestational thyroid

- ✓ Gestational anemia
- ✓ Cardiac arrhythmias; thromboembolism; asthma; renal disease; urinary tract infections; sickle cell disease; headache; seizures

Cesarean Section

A cesarean delivery — also known as a C-section or cesarean section — is the surgical delivery of a baby. It involves one incision in the mother's abdomen and another in the uterus.

It's a common procedure that's used to deliver nearly one-third of babies in the United States, according to the Centers for Disease Control and Prevention Trusted Source. Cesarean deliveries are generally avoided before 39 weeks of pregnancy, so the child has proper time to develop in the womb. Sometimes, however, complications arise, and a cesarean delivery must be performed prior to 39 weeks.

Horizontal. A low-transverse incision (or a “bikini cut”) is used in 95 percent of C-sections today. That's because it's done across the lowest part of the uterus, which is thinner — meaning less bleeding. It's also less likely to split if you try to have a vaginal birth after a C-section (VBAC) when delivering a future baby.



Vertical. Also known as a “classical” C-section, this cut is down the middle of the abdomen, usually from below the navel to the pubic hair line. It used to be common, but now is typically only reserved for certain situations. For example, it may be done if you already have a scar there from a previous surgery, if the baby is nestled low in your uterus or in another unusual position, or if an emergency requires immediate delivery. Vertical incisions may be slightly more painful and take a little more time to heal.

**Aim**

- Compare the advantages and disadvantages and complications of ANESTHETICS in CESAREAN SECTION and to try and find out the best procedure , in relationship with indication.
- Should monitor the parameters of the subject.
- We should review the comorbid conditions which are encountered in the subject at the time of pregnancy.

Objectives

- To determine the efficacy of Anesthetics in Cesarean Section
- To analyse the parameters and comorbid conditions encountered in the subjectt at pregnancy time

Need of Study

- To get better results, it is important to collect complete information on anesthetics and their effects in cesarean-section birth.
- **It is important to collect complete information about :**
 - Anesthetic drugs.
 - Doses.
 - Route of administration.
 - Comorbid conditions (anemia, pre-eclampsia, gestationaldiabetes, seizures.
 - Parameters. (age, height, body mass)
 - Fasting blood glucose concentration.

Methodology

Study Site: Dvc Hospital & Research Institute

Patient Selection And Procedures

To determine the efficacy of anaesthetic effects in caesarean section

180 patients gone through the CESAREAN SECTION they are selected for the study .and monitor the parameter and comorbid conditions

- ★ All those patients who are included have undergone baseline functions like urine analysis [albumin and glucose levels], blood analysis. doppler foetal monitoring
- ★ Parameters such as: age, height, body mass, fasting blood glucose concentration before and after the surgery should be analysed and monitored
- ★ Comorbid conditions like: anemia, pre-eclampsia, gestational diabetes, seizures etc., the severity of the condition should be monitored clearly
- ★ Observation of side effects at post operative stage

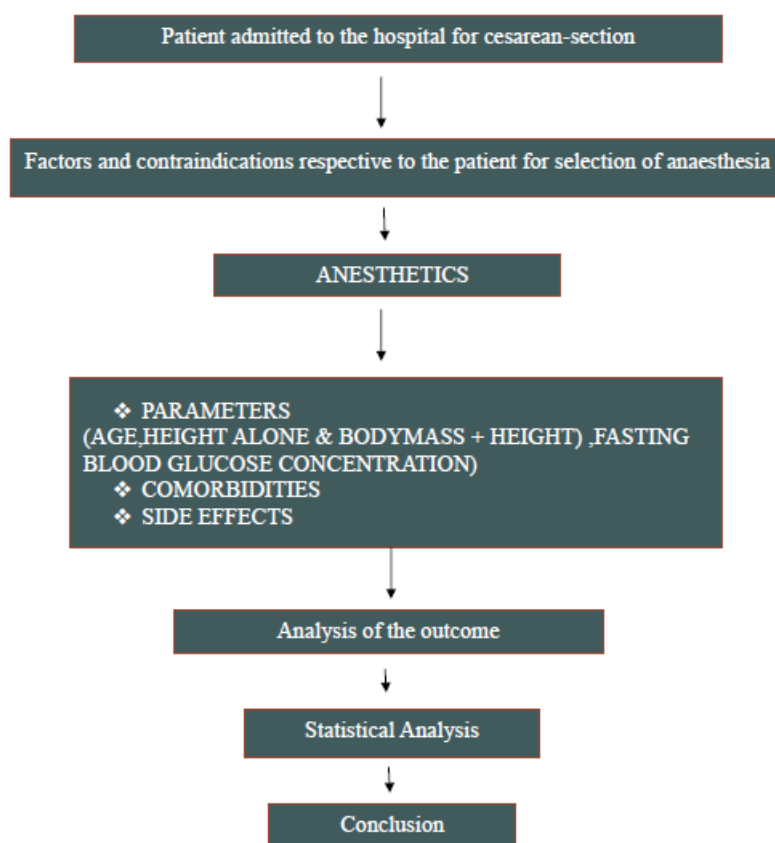
I. Inclusion Criteria

- ✓ Patient with PREGNANCY who need c-section .

II. Exclusion Criteria

- ✓ Other anesthetic related disease are not included in the study
- ★ Out of whole 180 patients 180 patients were reported into the study as per inclusion criteria.

Study Design

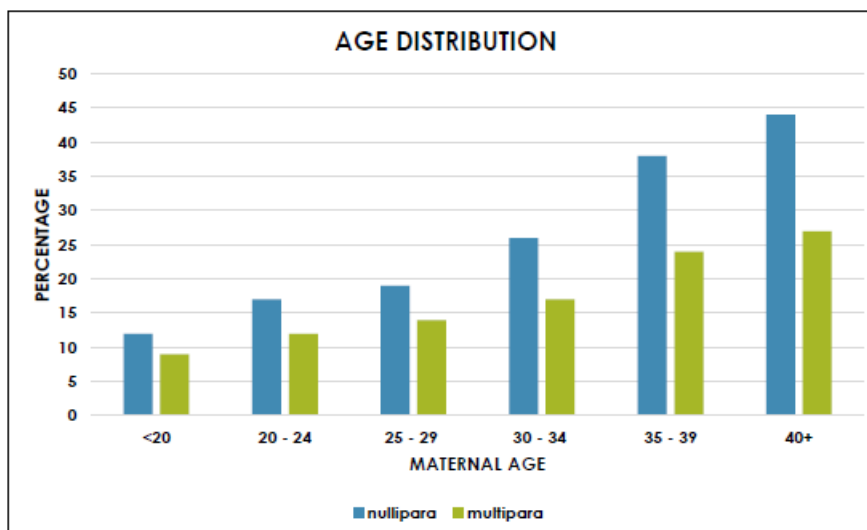


RESULTS AND DISCUSSION

This is a comparative study carried out in a Gynecology and Anesthesia unit at DVC HOSPITALS AND RESEARCH INSTITUTE. Here we observed 100-120 patients who went through the cesarean section based on their age, body weight, height, fasting blood glucose concentration, and comorbid conditions like (anemia, pre-eclampsia, gestational diabetes, seizures). Based on these factors, we are comparing spinal anesthesia and general anesthesia to know which anesthesia is a better choice for cesarean section.

1. AGE DISTRIBUTION WHO WENT THROUGH THE CESAREAN SECTION

Age	Nullipara	Multipara
<20	12%	9%
20 - 24	17%	12%
25 - 29	19%	14%
30 - 34	26%	17%
35 - 39	38%	24%
40+	44%	27%



In above figure the subjects are divided into two categories nullipara (the women that has never given birth) and multipara (the women that has more than one pregnancy) who gone through the cesarean section based on the various age.

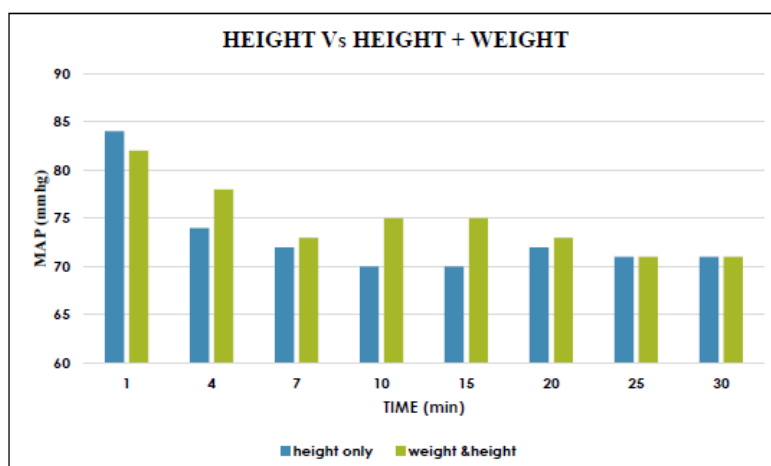
Body Mass And Height of The Subject and Suitable Anesthesia Based on The Condition

SUBJECT			Height	(cm)					
WEIGHT(KG)	140	145	150	155	160	165	170	175	180
50	1.5	1.7	1.8	1.9					
55	1.5	1.6	1.8	1.9	2.0				
60	1.4	1.6	1.7	1.8	2.0	2.1			
65	1.4	1.5	1.7	1.8	1.9	2.1	2.2		
70	1.3	1.5	1.6	1.8	1.9	2.0	2.2	2.3	
75		1.4	1.6	1.7	1.9	2.0	2.1	2.3	2.4
80		1.4	1.5	1.7	1.8	2.0	2.1	2.2	2.4
85			1.5	1.6	1.8	1.9	2.1	2.2	2.3
90			1.4	1.6	1.7	1.9	2.0	2.2	2.3
95				1.5	1.7	1.8	2.0	2.1	2.3
100				1.5	1.7	1.8	1.9	2.1	2.2
105					1.6	1.7	1.9	2.0	2.2
110						1.7	1.8	2.0	2.2

The above fig shows 0.5% bupivacaine spinal anesthesia is adjusted based on their body mass(kg) and height (cm)

(A) Comparision of Map Based on Body Mass +Height & Height

Comparission of P Value Based on Body Mass + Height & Height Alone

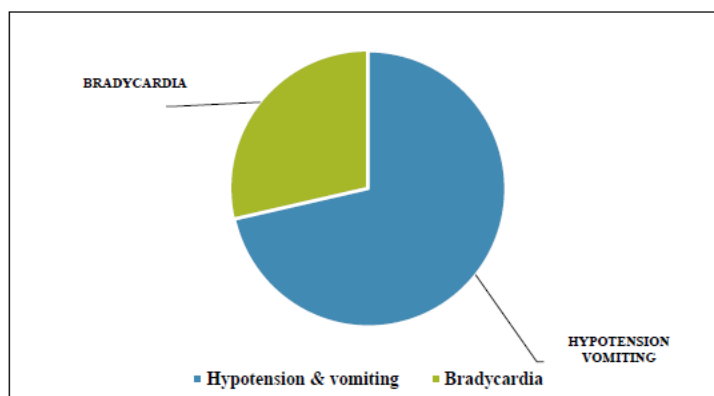


Comparison of MEAN ARTERIAL PRESSURE (MAP) between subject receiving anesthesia dosage based on height along and those whose dose was calculated based on height and weight, just a baseline difference was observed between them.

Bradycardia occurred in 2 subjects receiving an spinal anesthesia dosage. The incidence of hypotension was significantly higher in the height alone dosage group than in the height – weight group.

In 4 subject we can see episodes of vomiting (height-weight) and in 1 subject we can observe both hypotension and vomiting episodes (height alone)

(B) Effects Observed After Administration of Spinal Anesthesia

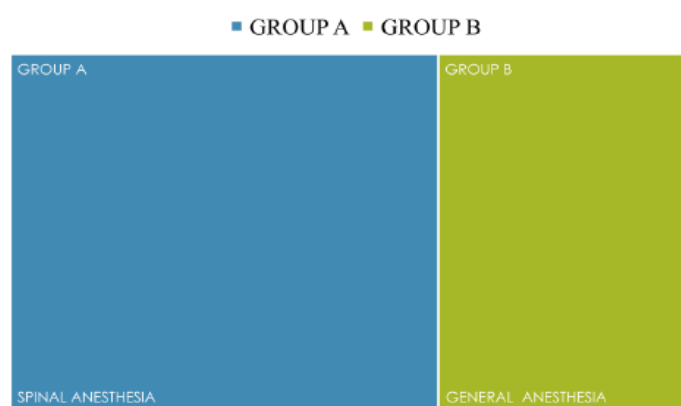


The above chart shows when we administered 0.5% of bupivacaine (spinal anesthesia) the subjects faced some issues like BRADYCARDIA, VOMTING, HYPOTENSION the subjects are divided into two categories in GROUP A 5 patients are taken in them we can observe both hypotension and vomiting conditions in GROUP B 2 patients are taken we can observe bradycardia in her when we give spinal anesthesia it prone to decrease in systemic

vascular resistance and cardiac output AND DROP OF BLOOD PRESSURE that leads to HYPOTENSION In cesarean section under spinal anesthesia BRADYCARDIA is not uncommon usually associated with high sympathetic nerve block In the combination of cesarean and spinal anesthesia due the symmetrical sensory and motorblock that leads to the disturbing side effects mostly observed are nausea and vomiting.

Table 5 2(C): Repeation of Spinal Anesthesia At L 3 – 4Interspace Or L4-5 Interspace.

EFFECTS OBSERVED	P - VALUE
Hypotension and vomiting	P < 0.05
Bradycardia	P > 0.05



In the above fig we compared that how many subjects are shifted to general anesthesia and howmany had the second dose of spinal anesthesia

- In GROUP A when we repeat the spinal anesthesia there were no dropouts In 3 patients (2.4ml) with highest dose of bupivacaine is repeated , in 2 patients (2.0ml) lower dose of bupivacaine is repeated
- In GROUP B when the subjects are shifted from spinal anesthesia to general anesthesia that leads to subarachnoid block
- ❖ Compared to group a and group b by repeating the spinal anesthesia the effect was high in GROUP A so the incidence of high spinal anesthesia lowered the effects and lead to successful cesarean section compared to GROUP B.

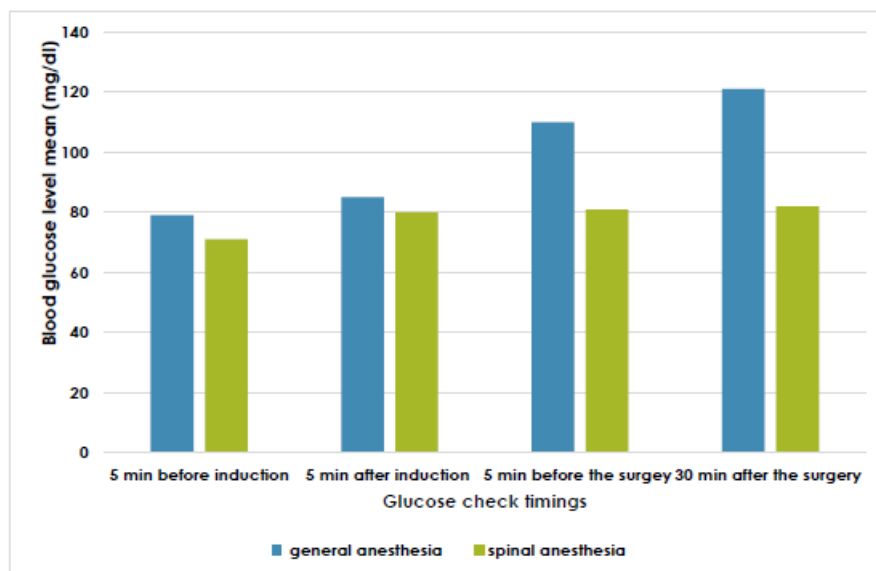
REPEATATION	P-VALUE
GROUP A	P < 0.001
GROUP B	P > 0.001

(A) Fasting Blood Glucose Concentration of Before and After Cesareansection.

TIME PERIOD	TYPES OF ANESTHESIA	MEAN VALUE	Std .DEVATION	N
5min before induction	General anesthesia	74.3	14.7	23
	Spinal anesthesia	78.3	18.2	35
	Total	76.7	16.9	58
5min after induction	General anesthesia	84.9	23.7	23
	Spinal anesthesia	79.2	18.3	35
	Total	81.4	20.6	58
5min before the end of surgery	General anesthesia	108.4	16.7	23
	Spinal anesthesia	80.2	18.1	35
	Total	91.4	22.3	58
30min before the surgery	General anesthesia	121.1	17.4	23
	Spinal anesthesia	80.9	17.7	35
	Total	96.8	26.4	58

The above table shows the mean and standard deviations for the 4 glucose check readings for the 2 GROUPS.

GLUCOSE CHECK TIMINGS	P- VALUE
5-min before induction	P = 0.38
5-min after induction	P = 0.3
5-min before the surgery	P < 0.001
30min after the surgery	P < 0.001



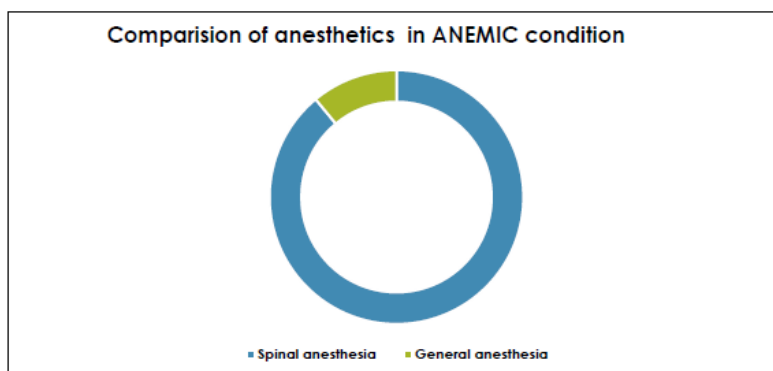
The mean values for the general anesthesia group increased more rapidly than those in spinal anesthesia.

The relationship between glucose check timing, type of anesthesia, mean blood glucose concentration for the subjects in the study.

Table 5.4: Comorbid Conditions.

(A): **Anemia:** no. of patients with and without anemic condition are represented in the below table.

CONDITION	WITH	WITHOUT	TOTAL NO.OF PATIENTS
ANEMIA	89	11	100

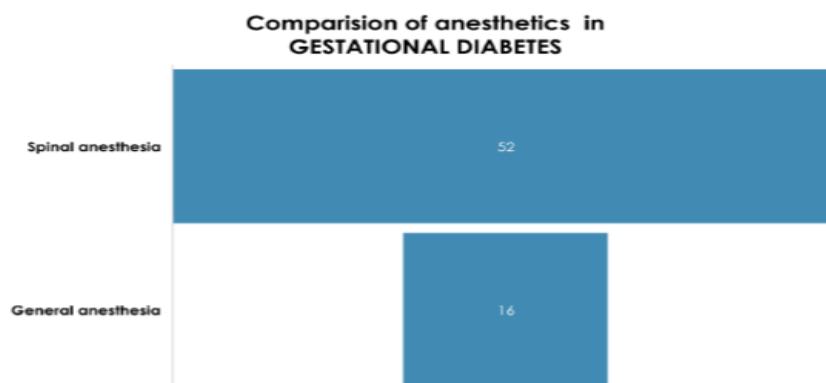


The above graph represents the no. of administrations of spinal and general anesthesia in anemic condition.

Pregnancy in anemic condition by administration of general anesthesia the blood loss was significantly high than spinal anesthesia however the no. of patients who received an intraoperative or post-partum blood transfusion was insignificant. Significantly patients who received general anesthesia showed up with adverse effects like hypotension bradycardia. In anemic patients' opioid usage is also high in general anesthetic administered patients.

(B): **GESTATIONAL DIABETES:** No. of patients with and without gestational diabetes condition are represented in the below table.

CONDITION	WITH	WITHOUT	TOTAL NO.OF PATIENTS
Gestational Diabetes	42	16	58

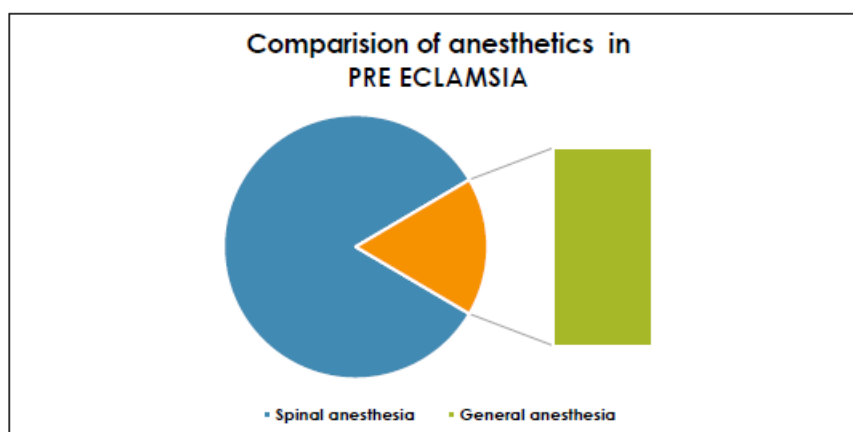


The above graph represents the no. of administrations of spinal and general anesthesia in gestational diabetes condition.

Diabetes in pregnancy, has potential serious adverse effects for both mother and neonate. Standardized multidisciplinary care including anesthesia should be carried out obsessively throughout pregnancy. When we are using general anesthesia for cesarean section, it increases the adverse reactions, so when gestational diabetes is seen in pregnancy.

(C): Pre Eclampsia: no. of patients with and without pre-eclampsia condition are represented in the below table.

CONDITION	WITH	WITHOUT	TOTAL NO.OF PATIENTS
PRE ECLAMPSIA	49	10	59

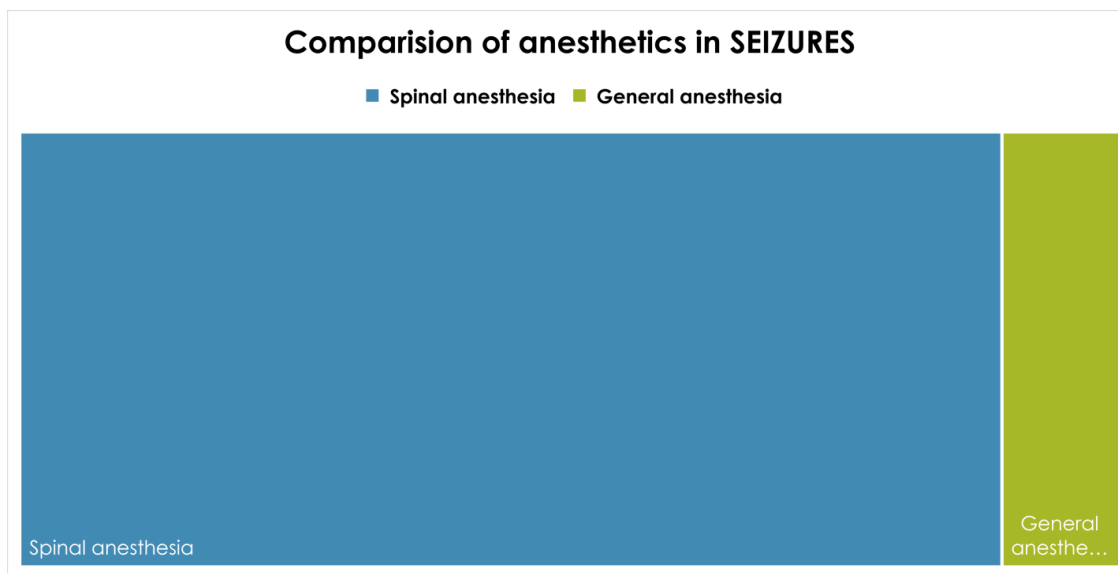


The above graph represents the no. of administrations of spinal and general anesthesia in pre-eclampsia condition.

Pre-Eclampsia In Pregnancy such as hypertensive crisis, stroke, and difficult airway management, are leading causes of morbidity and mortality in the preeclamptic population. Therefore, in the majority of severely preeclamptic patients, who are not coagulopathic or thrombocytopenic, the risk of difficult or failed airway management and delayed recognition of maternal stroke during a general anesthetic are felt to exceed the risk of adverse outcomes from spinal anesthesia-induced hypotension. By administration of general anesthesia that lead to increased side effects in preeclampsia condition.

(D): **SEIZURES**: no. of patients with and without seizures condition are represented in the below table.

CONDITION	WITH	WITHOUT	TOTAL NO.OF PATIENTS
SEIZURES	25	6	31



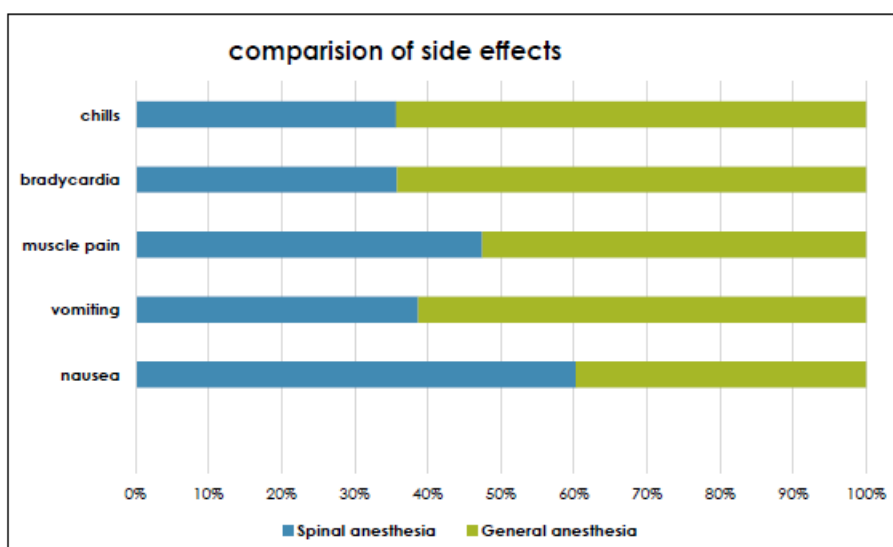
The above graph represents the no. of administrations of spinal and general anesthesia in seizures condition.

Seizures in pregnancy General anesthesia may be required for diagnostic and therapeutic procedures in patients with seizure disorders. There is concern regarding the safety of anesthetic drugs in these individuals because of the reported proconvulsant effect of selected medications. Potentially, general anesthesia may be associated with perioperative seizures or increased adverse effects in people with epilepsy.

Spinal anesthesia is better than general anesthesia.

TABLE 5: Comparison of Side Effects After Cesarean Section.

Condition	Spinal anesthesia	General anesthesia	P – VALUE
Nausea	79	52	P < 0.05
Vomiting	46	73	P < 0.05
Muscle pain	56	62	P < 0.05
Bradycardia	44	79	P < 0.05
Chills	51	92	P > 0.05



Comparison of side effects of both general and spinal anesthesia had reached the baseline comparatively spinal anesthesia is better than general anesthesia.

Table 5.6: Overall Comparison of Spinal Anesthesia And General Anesthesia Based On Different Variables.

MEAN VALUE + STD DEVIATION = NOT SIGNIFICANT $P > 0.005$

VARIABLES	SPINAL ANESTHESIA	GENERAL ANESTHESIA	P-VALUE
BLOOD LOSS (ml)	632 - 216	787 - 322	<0.01
TRANSFUSION	2%	14%	<0.05
APGAR 1min	8.17 - 1.02	6.84 - 2.00	<0.001
APGAR 5min	8.91 - 0.73	8.13 - 1.74	<0.001

14%, $p < 0.05$). Mothers who underwent SA had an insignificant trend toward shorter length of stay (6.42 ± 1.61 vs 6.86 ± 1.82 days, $p = 0.16$) than those who underwent GA. SA had significantly better one minute (8.17 ± 1.02 vs 6.84 ± 2.00 , $p < 0.0001$) and 5 minute (8.91 ± 0.73 vs 8.13 ± 1.74 , $p < 0.001$) Apgar scores.

DISCUSSION

The parameters which we have taken in this study are AGE DISTRIBUTION , BMS + HEIGHT&HEIGHT ALONE , FASTING BLOOD GLCOSE CONCENTRATION BEFORE AND AFTER SURGERY , & SIDE EFFECTS.

If we observed clearly in age distribution that nullipara is having the higher point than compared to the multipara that means most of the cesarean section are done in nullipara subjects.

In BMS + height & height alone condition the mostly spinal anesthesia is preferred and the dosage is adjusted based on their height and body weight in that case we observed some of sideeffects like hypotension, vomiting's ,bradycardia in this case by analyzing the P –value hypotension & vomiting p-value is about $p < 0.05$ and bradycardia alone is about $p > 0.05$. When we repeated the spinal anesthesia the p value is about $P < 0.001$ the symptoms are decreased andthey became normal compared to general anesthesia ($P > 0.001$).

By analyzing the data of 5 min before surgery t 30 min after surgery the p values are significant.

Analysis of comorbid conditions like anemia , pre-eclampsia, gestational diabetes , seizures they are common conditions observed in pregnancy women in most of the cases spinal anesthesia is preferable than general anesthesia.

By administration of anesthesia we can notice some side effects like nausea ($P < 0.05$, vomiting($P < 0.05$), muscle pains ($P < 0.05$), chills ($P < 0.05$), bradycardia ($P < 0.05$) there are significantchanges in p-values The overall study of spinal and general anesthesia p values are in this way 14%, $p < 0.05$). Mothers who underwent SA had an insignificant trend toward shorter length of stay (6.42 ± 1.61 vs 6.86 ± 1.82 days, $p = 0.16$) than those who underwent GA. SA had significantly better one minute (8.17 ± 1.02 vs 6.84 ± 2.00 , $p < 0.0001$) and 5 minute (8.91 ± 0.73 vs 8.13 ± 1.74 , ($p < \text{Apgar scores}$).

CONCLUSION

Generally when we are planning for cesarean section, you may have a choice of anesthetic while selecting anesthesia we have to observe every parameter some of them we observed here they are AGE DISTRIBUTION factors they are observed based on multipara and nullipara conditions, MEAN ARTERIAL PRESSURE based on HEIGHT ONLY and BODY MASS along HEIGHT, FASTING BLOOD GLUCOSE CONCENTRATON of before and after cesarean section and COMORBID CONDITIONS like anemia, gestational diabetes, pre- eclampsia, and seizures, ADVERSE EFFECTS after the cesarean section by administrationanesthesia.

By comparing these factors and analyzing the p-value for general anesthesia and spinal anesthesia we are concluding that spinal anesthesia is better than general anesthesia for cesareansection.

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