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Original Research Article

Prospective, non-randomized, parallel group, comparative observational study to compare maternal and neonatal outcome after regional and general anesthesia for Lower Segment Caesarean Section

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ABSTRACT

Background: LSCS is a routine obstetric procedure performed under general anesthesia (GA) or regional anesthesia (RA). Choice of anesthesia depends on factors like gestational age, parity, co-morbidities, urgency of situation, etc. Both GA and RA involve the use of various medications which may influence maternal and neonatal outcome. As there are few studies comparing maternal and fetal outcome in RA and GA for LSCS in Indian population, the present study was taken up. Objectives of the study was to compare the maternal and neonatal outcome after RA and GA for LSCS.
Methods: 60 subjects with indications for LSCS were assigned non-randomly into two groups, 30 for GA and 30 for RA, at the discretion of anesthesiologist. The demographic, anthropometric and clinical data was recorded for all subjects. The maternal outcome after RA and GA for LSCS was assessed by parameters like maternal blood loss, postoperative pain, postoperative nausea and vomiting, maternal satisfaction and neonatal outcome by parameters like birth weight, APGAR scores and NICU admissions. The maternal and neonatal outcome between the two groups was compared.
Results: All subjects had clear indications for CS. In most of the subjects it was undertaken as an emergency procedure. GA was preferred in high risk subjects. Maternal blood loss, postoperative pain, NICU admissions, need for resuscitation was less under RA compared to GA. There was no difference in PONV, maternal satisfaction, birth weight and need for intubation.
Conclusions: LSCS under RA showed a more favourable maternal and neonatal outcome.

Keywords: GA, LSCS, Maternal and Neonatal outcome, RA

INTRODUCTION

Caesarean section (CS) can be defined as the birth of the fetus through incisions in the abdominal wall (laparotomy) and the uterine wall (hysterotomy).[1] There is a gradual increase in the incidence of CS, with a 2 to 3 fold rise from the initial rate of 10%, with classical CS being almost replaced by Lower segment CS (LSCS), except in rare cases of maternal complications like fibroid uterus and carcinoma cervix.[2] During the 20th century, in parallel with this decreasing maternal mortality, there has been an increase in the incidence of CS.[3] With the gradual reduction in the complications, the worldwide popularity of CS also increased but still there is a greater incidence of

morbidity and mortality after CS as compared to vaginal delivery.[4] The type of anaesthesia and the care with which it is administered is an important determinant of the outcome of CS, and the choice of anaesthesia depends on numerous factors such as the indications for the procedure, urgency of the situation, gestational age, parity, coexisting medical problems and maternal preference. The anesthetic objectives during CS include appropriate anesthetic level to optimize surgical conditions and minimize maternal recall, adequate perfusion and oxygenation of maternal and fetal organs and tissues, minimal transfer of anesthetic agents to the neonate and minimization of uterine atony following delivery.[5]

Considering the benefits and risks of the different techniques, it is important to determine the type of anaesthesia suitable in terms of maternal and neonatal outcome. General anaesthesia refers to the loss of ability to perceive pain associated with loss of consciousness, produced by intravenous or inhalation anesthetic agents.[6] Regional anaesthesia involves the injection of local anesthetic solutions into subarachnoid (spinal) or extradural space (epidural), to produce circumscribed areas of loss of sensation.[6] Both general and regional anesthesia involves the use of several drugs with a potential to alter the maternal and neonatal outcome. There is no single ideal method of anaesthesia, either general or regional, and each procedure having their own advantages and risk to both mother and fetus.[7] Few systematic studies have been done in Indian population to assess and evaluate the effect of various medications used in general and regional anaesthesia on maternal and neonatal outcome, and hence the present study was taken up to study the influence of regional and general anaesthesia on the maternal and fetal outcome in Indian subjects undergoing LSCS.

METHODS

This prospective, non-randomized, parallel group, comparative observational study was carried out from January 2014-June 2015 in department of anaesthesia in KIMSH & RC, Bangalore. After obtaining approval and clearance from the Institutional Ethics Committee, 60 subjects undergoing elective or emergency LSCS were assigned into two groups-30 for general anaesthesia and 30 for regional anaesthesia at the discretion of the anaesthesiologist, and as suitable for the procedure. The written informed consent for scrutinizing the records and collection of the data was obtained from all the subjects or their legal representatives, after fully explaining the study procedure to their satisfaction. Subjects with uterine rupture or secondary abdominal pregnancy or intrauterine death of fetus were excluded from the study. Demographic, anthropometric and clinical data such as maternal age, socioeconomic status, height and weight of subjects, ASA grading, type of procedure, stage of gestation, type of anaesthesia, duration of hospital stay, previous/past obstetric history and indications for the procedure were recorded.

The maternal outcome related to the anesthetic procedure was assessed by estimating amount of blood loss, postoperative pain, incidence of postoperative nausea and vomiting (PONV) and maternal satisfaction. Blood loss was assessed by visual estimation method based on the amount of blood collected in the suction bottle.[8] Postoperative pain and postoperative nausea was assessed by VAS (visual analogue scale), ranging from 0-10 (Score: 1-3 = mild, 4-6 = moderate, 7-10 = severe).[9,10] The maternal satisfaction regarding the surgical and anesthetic procedure, the outcome, hospital environment, sanitation, medical and paramedical staff, nursing care, hospital stay, etc. based on the subjective assessment was assessed using visual analogue scale and was expressed as scores ranging from 1-5 (Score: 1 and 2 = unsatisfied 3,4,5 = satisfied).[11] The number of episodes of emesis were also recorded. The nausea scores, vomiting episodes & pain scores were recorded at intervals of 2 hrs, 6 hrs and 24 hrs after LSCS. Neonatal outcome was assessed by birth weight, APGAR scores (1-10) at 1 and 5 minutes and need for NICU admission, need for resuscitation and need for intubation.

Descriptive statistics like frequency, percentage, mean and standard deviation were used for obstetrical history and indications of LSCS. Independent t-test was used to compare the age of the subjects, gestational age, weight and height of subjects, duration of postoperative hospital stay, amount of blood loss, birth weight and mean APGAR scores between the two groups. Chi-square test was used to compare distribution of living status, type of LSCS, maternal satisfaction, number of NICU admissions, need for intubation and resuscitation between the two groups. Mann Whitney U test was used to compare socioeconomic status, ASA status, mean scores of PONV and postoperative pain at 2 hrs, 6 hrs, and 24 hrs between the two groups. The results were also depicted in the form of tables and graphs. Statistical software namely SPSS v21 was used for analysis of data and Microsoft Word and Excel were used to generate graphs and tables.

RESULTS

In this study, total 60 patients underwent lower segment caesarean section, 30 in spinal group and 30 in general anesthesia group. Table 1 document details about the demographic data, living status, socioeconomic status, ASA grading, type of LSCS and gestational age at the time of procedure. The mean age of subjects was 26.16±4.37 years, and majority of the subjects (76.66%) were in the age group between 20 to 29 years. Most of the subjects (78.33%) were from urban background and from upper middle, lower middle and upper lower class. Majority of the subjects had ASA grade 1 or 2 (88.34%), indicating low risk situations, and only 7 subjects (11.66) with grade 3, and none with grade 4. Majority of the subjects (78.33%) required emergency LSCS because of acute obstetrical complications. Mean gestational age at the time of delivery was 37.46±2.09 weeks, and majority of subjects (70.00%) underwent LSCS at gestational age between 37-42 weeks,

28.33% between 32-37 weeks (preterm), and only one subject (1.66%) above 42 weeks (post term).

Table 1: Demographic and clinical data of the subjects undergoing LSCS under RA and GA.

Variables	Regional anesthesia* (N=30) n (%)	General anesthesia (N=30) n (%)
Age (in years)		
<20	01(3.33)	01(3.33)
21-24	12(40.00)	09(30.00)
25-29	12(40.00)	13(43.33)
30-34	04(13.33)	07(23.33)
35-39	01(3.33)	00(0.00)
Total	30(100)	30(100)
Mean±SD	25.43±4.24	26.9±4.44
Living status†		
Urban	27(90.00)	20(66.66)
Rural	03(10.00)	10(33.33)
Total	30(100)	30(100)
Socioeconomic status‡		
Upper	01(3.33)	00(0.0)
Upper middle	06(20.00)	05(16.66)
Lower middle	11(36.66)	13(43.33)
Upper lower	11(36.66)	10(33.33)
Lower	01(3.33)	02(6.66)
Total	30(100)	30(100)
ASA grading§		
ASA 1	17(56.66)	11(36.66)
ASA 2	10(33.33)	15(50.00)
ASA 3	03(10.00)	04(13.33)
ASA 4	Nil	Nil
Total	30(100)	30(100)
Type of LSCS		
Elective	07(23.33)	06(20.00)
Emergency€	23(76.66)	24(80.00
Total	30(100)	30(100)
Gestational age (in weeks)		
32-<37	06(20.00)	11(36.66)
37-<42	24(80.00)	18(60.00)
>42	Nil	01(3.33)
Total	30(100)	30(100)
Mean ± SD	37.73±2.22	37.20±1.95

*Spinal anesthesia with 0.5% hyperbaric bupivacaine
†Difference between groups in distribution of living status was p = 0.028 as assessed by Chi square test.
‡Based on Kuppuswamy socioeconomic status scale (Modified for 2012)
§According to the ASA Physical Status classification
€Unforeseen or acute obstetrical emergencies like, eclampsia, severe preeclampsia, PROM, prolapsed umbilical cord, APH, etc.

Table 2 shows the anthropometric data and duration of postoperative hospital stay for subjects undergoing LSCS. The average height of subjects who underwent LSCS under RA and GA was 152.88±6.08 cm and 151.48±5.12 cm respectively. The average weight of subjects who underwent LSCS under RA and GA was 68.4±11.79 kg and 64.46±7.56 kg respectively. The difference in height and weight of the subjects in each group was not statistically significant. Overall duration of postoperative hospital stay ranged from 4 to 13 days in RA, and 5 to 16 in GA, the mean duration being 6.66±2.12 days and 8.96±3.03 days with RA and GA respectively, and the difference was statistically significant (p=0.001).

Table 2: Anthropometric data of subjects and duration of postoperative hospital stay.

Variable	Regional anesthesia (Mean±SD)	General Anesthesia (Mean±SD)	P value
Height (cm)	152.88±6.08	151.48±5.12	0.339
Weight (kg)	68.4±11.79	64.46±7.56	0.131
Duration of postoperative hospital stay (days)	6.66±2.12	8.96±3.03	0.001

Table 3 depicts the obstetrical history of subjects who underwent LSCS. 22 subjects had history of previous gestations with 12 abortions and 10 viable gestations from each group. One subject had the history of PIH and another subject history of GDM during the previous pregnancy in GA group.

Table 3: Obstetrical history* (n=60).

Parity	RA n (%)	GA n (%)	Total n (%)
Abortions†	12(40.00)	12(40.00)	24(40.00)
Viable gestation‡	10§ (33.33)	10€ (33.33)	20(33.33)
Others	Nil	2¥ (6.66)	2(3.33)

*Previous gestations; 8 subjects had no previous gestations
†Did not complete >20 weeks of gestation (one or repeated abortions)
‡Completion of >20 weeks of gestation with live birth
§ 9 subjects had undergone LSCS
€ 7 subjects had undergone LSCS
¥ One subject had history of PIH and one subject GDM in previous pregnancy

Table 4 summarizes the various indications for LSCS in the present study. There were multiple indications in 23 subjects, whereas 16 subjects had previous CS, 2 subjects malpresentation, 5 subjects fetal distress, 8 subjects CPD, 4 placental abnormalities and 2 subjects with comorbid conditions. RA was generally preferred in subjects with previous CS, and GA in subjects with multiple indications and in subjects with immediate threat to life of mother or fetus.

Figure 1 demonstrates the comparison of blood loss between the two groups. About 90% of the subjects under RA had blood loss of less than 500ml compared to 30%

subjects under GA. Only 10% of the subjects under RA showed blood loss between 501-1000 ml as against 50% under GA. None of the subjects under RA showed blood loss of >1000 ml, whereas 5 subjects showed blood loss of 1000-1500 ml, and one subject >1500 ml under GA. The mean blood loss (in ml) was 401.6±95.12 with RA and 783.33±368.7 with GA which was statistically highly significant (p<0.001). Need for blood transfusion involving the whole blood, frozen plasma, platelet and RBC concentrates was also more in number of subjects under GA (36.66%) as compared to RA (3.33%), which was statistically highly significant (p=0.001).

Table 4: Indications of caesarean section (n=60).

Indications	RA n (%)	GA n (%)	Total n (%)
Previous CS	09(30.00)	07(23.33)	16(26.66)
Malpresentation	02(6.66)	Nil	02(3.33)
Fetal distress	04(13.33)	01(3.33)	05(8.33)
CPD	06(20.00)	02(6.66)	08(13.33)
Co-morbid conditions*	Nil	02(6.66)	02(3.33)
Placental abnormalities†	Nil	04(13.33)	4(6.66)
Multiple indications‡	09(30.00)	14(46.66)	23(38.33)
Total	30(100)	30(100)	60(100)

*GDM (n=1), Thrombocytopenia (n=1)
†Placenta praevia (n=3), Abruptio placentae (n=1)
‡Previous CS + CPD (n =2), Fetal distress+ Impending eclampsia (n = 1), Failure to progress + Severe PIH (n = 1), Fetal distress + CPD (n = 1), Previous CS + CPD + PIH (n = 1), Previous CS + Malpresentation (n = 1), Malpresentation + Prematurity (n = 1), Fetal distress + Cord abnormalities (n = 1), Previous CS + Malpresentation + Placental abnormalities (n= 1), Previous CS + Impending eclampsia (n = 2,) Fetal distress + Placental abnormalities (n = 1), Previous CS + Placental abnormalities (n = 1), Previous CS + comorbid conditions (n = 1), Previous CS + Severe PIH (n = 1), Previous CS + Fetal distress + Impending eclampsia (n = 1), Malpresentation + Anemia (n = 1), Fetal distress + Failure to progress (n = 1), Impending eclampsia + Placental abnormalities(n = 1), Previous CS + comorbid conditions (n = 1), Previous CS + Placental abnormalities + Severe PIH (n = 1), Previous CS + Thrombocytopenia (n = 1)

Table 5 describes the incidence of postoperative nausea and vomiting (PONV) with the two anesthetic procedures at different time intervals (2hrs, 6hrs and 24hrs). PONV was only mild to moderate, and not severe in any of the subjects. Mild nausea occurred in four subjects after 2 hrs and 6 hrs but was not seen after 24 hrs in RA, whereas five subjects had mild nausea at 2hrs, three subjects at 6hrs and one subject at 24 hrs in GA. Moderate nausea was seen in one subject under RA and two subjects under GA after 2 hrs, but none after 24 hours. One episode of vomiting occurred at 2 hrs in RA group. There was no statistically significant difference in incidence of PONV between the groups.

Figure 2 summarizes the postoperative pain in the study subjects. There was a statistically significant difference in mean pain scores at 2 hrs and 6 hrs with greater pain scores in GA than RA group, but no significant difference at 24 hrs. 19 subjects from GA group required rescue analgesia with tramadol and pentazocine as against only 8 subjects from RA group.

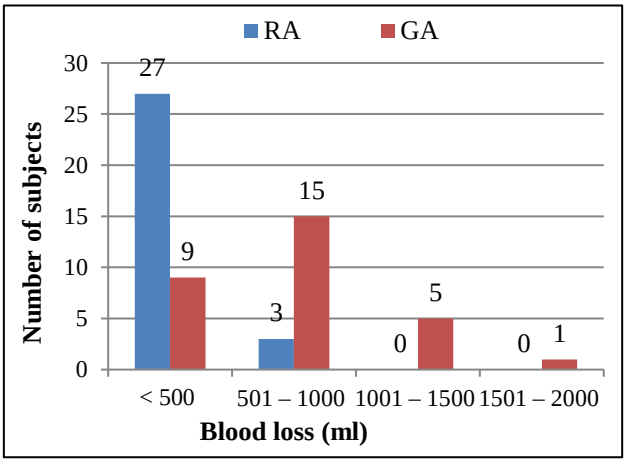

Figure 1: Comparison of amount of blood loss after RA and GA for LSCS assessed by visual estimation.

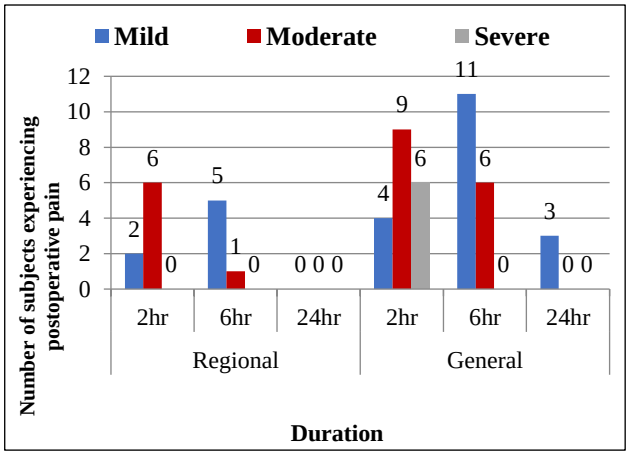

Figure 2: Comparison of postoperative pain between the groups.

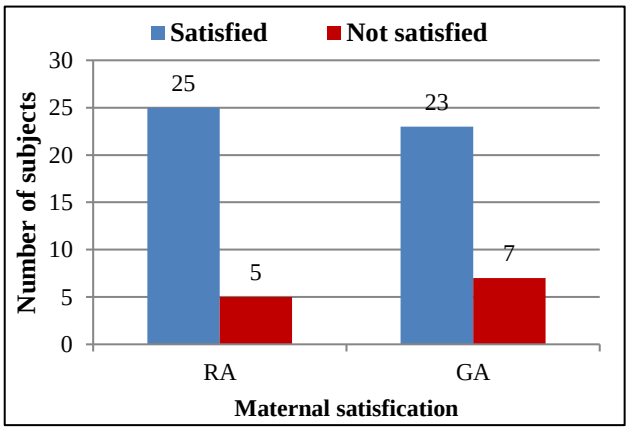

Figure 3: Comparison of Maternal Satisfaction between groups based on visual analogue scale.

Figure 3 summarizes the overall maternal satisfaction with majority of the subjects (80%) expressing their overall satisfaction with both procedure and there was no statistically significant difference between the groups.

Table 5: Comparison of incidence of postoperative nausea and vomiting* between the groups (n=60).

PONV†	RA (n=30)			GA (n=30)		
	2hr	6hr	24hr	2hr	6hr	24hr
Mild	4	4	Nil	5	3	1
Moderate	1	Nil	Nil	2	Nil	Nil
Severe	Nil	Nil	Nil	Nil	Nil	Nil
Mean±SD	0.2±0.48‡	0.13±0.34§	0.0±0.0€	0.3±0.59‡	0.1±0.3§	0.03±0.18€

*Assessed by visual analogue scale (0-10).
†No intraoperative episode of vomiting in either group, one episode of postoperative vomiting in RA; no episode of postoperative vomiting under GA. Inj. Ondansetron 4mg IV was used as rescue antiemetic
‡ P value at 2hr = 0.504 (Mann- Whitney U test)
§ P value at 6hr = 0.690 (Mann- Whitney U test)
€P value at 24hr =0.317 (Mann Whitney U test)

Table 6: Comparison of birth weight and number of NICU admissions, need for resuscitation and intubation for neonates born by LSCS under RA and GA.

ariables	RA	GA	Total
	n (%)		
Birth weight (kg)			
1-1.49*	01(3.33)	01(3.33)	02(3.33)
1.5-1.99†	03(10.00)	05(16.66)	08(13.33)
2-2.49†	03(10.00)	05(16.66)	08(13.33)
2.5-2.99	13(43.33)	13(43.33)	26(43.33)
3-3.49	08(26.66)	04(13.33)	12(20.00)
3.5-4	02(6.66)	02(6.66)	04(6.66)
Total	30(100)	30(100)	60(100)
Mean±SD	2.70±0.60‡	2.55±0.55‡	2.62±0.57
Number of NICU admissions§			
Yes	04(13.33)€	12(40.00)€	16(26.66)
No	26(86.66)	18(60.00)	44(73.33)
Need for resuscitation¥			
Yes	03(10.00)Δ	11(36.66)Δ	14(23.33)
No	27(90.00	19(63.33)	46(76.66)
Need for intubationα			
Yes	03(10.00)β	07(23.33)β	10(16.66)
No	27(90.00)	23(76.66)	50(83.33)

*VLBW
†LBW
‡*P* = 0.342 (Independent t-test)
§Because of prematurity (n=6), birth asphyxia (n=4), meconium stained liquor (n=2), LBW (n=2), congenital heart disease – ASD (n=1), transferred because mother required ICU admission (n=1)
€*P* value= 0.02 (chi-square test)
¥Cardiopulmonary resuscitation because of respiratory distress
Δ*P* value = 0.015 (chi-square test)
αEndotracheal intubation because of the failure of supplemental oxygenation & bag and mask resuscitation.
β*P* = 0.166 (chi-square test)

The comparison of neonatal outcome referring to the birth weight, number of NICU admissions, need for intubation and resuscitation is presented in Table 6. All the subjects had live births without any neonatal deaths in either group. Majority of neonates (70%) had normal birth weight (>2.5 kg), and the overall range was 1.4 kg to 3.9 kg in RA and 1.4 kg to 3.7 kg in GA, and the mean birth weight (in kg) was 2.70±0.60 and 2.55±0.55 in RA and GA groups respectively, and the difference was not statistically significant. There was a significant difference in the number of NICU admissions between the groups with higher number of NICU admissions following LSCS under GA. A total of 14 neonates, 3 from RA and 11 from GA needed cardiopulmonary resuscitation because of respiratory distress. The resuscitation involved oxygen insufflation, bag mask ventilation, suctioning and chest compressions. Among these subjects all the 3 from RA and 7 from GA also required endotracheal intubation because of the failure of supplemental oxygenation and bag and mask ventilation.

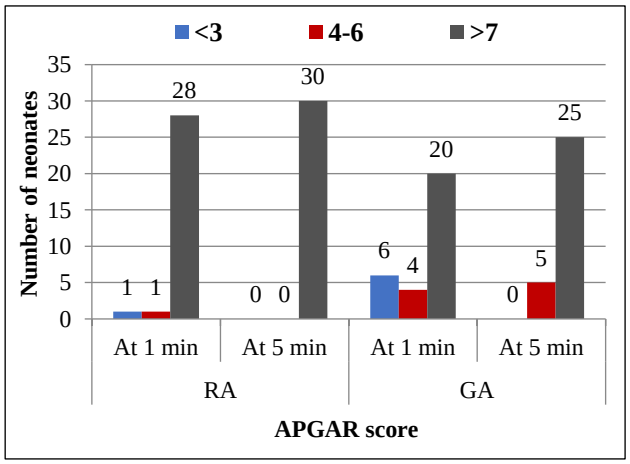

Figure 4: Comparison of APGAR scores at 1 min and 5 min in between the groups.

Figure 4 shows comparison of APGAR scores at 1 min and 5 min in between the groups. The mean APGAR score was 7.73±0.9 at 1 min and 8.9±0.40 at 5 min in RA, and 6.5±2.24 at 1 min and 7.97±1.62 at 5 min in GA. The difference in the mean APGAR score was statistically significant at both stages of recording.

DISCUSSION

In the present study, the subjects were assigned non-randomly for the two different techniques of anesthesia based on the prevailing maternal and fetal conditions, at the discretion and preference of anesthesiologist. GA was preferred in subjects with higher fetal and maternal risk. Even though this was not a randomized study there was no significant difference in the variables and baseline characteristics, such as demographic and anthropometric data, obstetric history, gestational age and ASA status, indications for LSCS and the type of LSCS (elective or emergency).

Majority of the subjects were in the age group between 20 to 29 years with only two subjects < 20 years (3.33%), and one subject (1.66%) above the age of 35 years inspite of the fact that LSCS is the generally preferred method for childbirth in subjects above 35 years. This was consistent with the observations from other studies reflecting the increasing trend to undertake LSCS even in patients in a relatively younger age group (< 30 years).[11-17] Most of the study subjects were from upper middle, lower middle and upper lower class, probably reflecting the socioeconomic strata of the subjects preferring the tertiary care teaching hospital in a private establishment. There was no statistically significant difference between the two study groups, which was consistent with previous studies.[17] Our observations also indicate an increasing trend even in the lower middle and upper lower socioeconomic strata to avail or utilize quality healthcare facilities because of increased availability of the various governmental and non-governmental schemes ensuring effective insurance coverage. Majority of the subjects had ASA grade 1 or 2 (88.34%), indicating low risk situations, and only 7 subjects (11.66) with grade 3, and none with grade 4. There was no statistically significant difference between the study groups in the ASA status. Though, this classification may not suggest or indicate the type of anesthetic procedure, it is an assessment of relative risk based on medical history and physical status.[18] However, women with ASA grade 4 are more likely to receive GA as reported in previous studies.[19] Majority of the subjects required emergency CS because of acute obstetrical complications like eclampsia, severe preeclampsia, PROM, APH, etc, and elective CS was done only in 13 subjects (21.66%) and there was no significant difference in the type of procedure between the two groups, as also observed in the previous studies.[12,14] The mean gestational age at the time of LSCS was 37.73±2.22 weeks and 37.20±1.95 for subjects in RA and GA group respectively, with majority of subjects (70.00%) between 37-42 weeks. There was no statistically significant difference in the gestational age between the study groups. Similar observations were made in other studies.[14,20,21] Though preterm and post term gestations are more likely to require LSCS, gestational age as such appears to have no bearing on the choice of anesthetic procedure.

There was no statistically significant difference in terms ofheight and weight between the two groups.[13,20] Some studies have reported that shorter women with height <154 cm are more likely to undergo LSCS. Obesity may also increase the need for LSCS due to increased risk of complications including pre-eclampsia, diabetes and gestational hypertension.[21,22] The mean duration of hospital stay was less with RA than GA, and the difference was statistically significant (p=0.001). This may be probably because of the fact that subjects referred to GA may have higher risk factors or complications and also because of longer NICU stay. Other studies have also recorded a longer duration of stay under GA compared to RA.[11,13]

In our study, 22 subjects had history of previous gestations with 12 abortions and 10 viable gestations, from each group. Previous abortions are known to increase the risk of spontaneous preterm births and placenta praevia, and multiparity has shown to decrease the need for CS.[23-25] RA is generally preferred in subjects with previous CS, and GA in subjects with multiple indications and in subjects with immediate threat to life of mother or fetus. GA is the procedure of choice in subjects with coagulation defects or spinal abnormalities, where RA is contraindicated. All the subjects had definite and clear indications for the procedure. Though there was no significant difference in the indications between the two groups, GA was indicated in all subjects with placental abnormalities. Similar observations were made in several other studies.[14,15,26,27]

The mean blood loss (in ml) was 401.6±95.12 with RA and 783.33±368.7 with GA, which was statistically highly significant ($p<0.001$). These findings were consistent with previous studies.[6,12,14,15,28] This may be because of the uterine relaxant effect of halogenated inhalational anesthetics, as the CS is usually performed under GA in subjects with placental abnormalities.[12,14] Blood transfusion involving the whole blood, frozen plasma, platelet and RBC concentrates was required in 11 subjects under GA, and only in one subject under RA, which was statistically highly significant ($p=0.001$). Other studies have also reported similar observations.[15] There was no statistically significant difference in the mean scores of postoperative nausea between the groups which was in accordance with reports from other studies.[13,20,28] There was a statistically significant difference in mean pain scores at 2 hrs and 6 hrs, but no significant difference at 24 hrs. Tramadol (50 mg IM) was the primary option and pentazocine (30 mg IV) was used as reserve drug in the event of inadequate pain relief. Other studies have also observed higher incidence of postoperative pain following GA as compared to RA.[6,12,13,20,28] The high incidence of postoperative pain following GA may be due to lack of residual analgesia because of the short half-life of the various medications used, and sustained spinal analgesia provided by intrathecal bupivacaine. Majority of the subjects (80%) expressed their overall satisfaction and there was no statistically significant difference between the groups. Only 20% of the subjects seemed to be not satisfied probably because of the subjective discomfort, or because of the standard of care being not up to their expectations. Similar observations were made in other studies.[6,12]

All the subjects had live births without any neonatal deaths in either group. There was no significant difference in the birth weight between the two anesthetic procedures for LSCS which was consistent with other studies.[15,29] There was a significant difference in the number of NICU admissions between the groups. Similar observations were made in several other previous studies.[11,15,30] The higher number of NICU admissions following LSCS under GA are probably because of the low APGAR scores and preexisting risk factors or co morbid conditions and may not be directly related to the anesthetic procedure. More number of subjects from GA group needed cardiopulmonary resuscitation because of respiratory distress. Other studies have also reported a higher incidence of respiratory distress in the neonates following CS under GA increasing the need for resuscitation and endotracheal intubation compared to the procedure under RA.[11,13,28,29] Majority of the subjects from both the groups had normal APGAR scores (>7). However, there was a significant difference in the mean score between the groups. Other studies have also reported higher mean APGAR scores in neonates under RA compared to GA.[11,14-16,29] This may be because of the neonatal depression produced by several CNS depressant drugs used in GA which cross the placenta due to high lipid solubility as compared to RA. There was improvement in the APGAR score from 1 min to 5 min, in both the groups. The improvement in the APGAR score from 1 min to 5 min indicates transient effect of the CNS depressants.[11,14]

CONCLUSION

LSCS under RA was associated with more favourable maternal and neonatal outcome with less maternal blood loss, postoperative pain, lesser number of NICU admissions and need for resuscitation in neonates; however, there was no significant difference in PONV, maternal satisfaction and birth weight of neonates between the groups.

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