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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE www.geomednews.com

к сведению авторов!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра. Используемый компьютерный шрифт для текста на русском и английском языках - Times New Roman (Кириллица), для текста на грузинском языке следует использовать AcadNusx. Размер шрифта - 12. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста в tiff формате.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов -

http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of 3 centimeters width, and 1.5 spacing between the lines, typeface - Times New Roman (Cyrillic), print size - 12 (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles. Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html http://www.icmje.org/urm_full.pdf

In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

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რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - Times New Roman (Кириллица), ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ AcadNusx. შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით tiff ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის პოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენოპა არ უნდა აღემატეპოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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MATERNAL AND NEONATAL OUTCOME ACCORDING TO THE TYPE OF ANESTHESIA DURING CAESAREAN SECTION

Asmaa Abdulrazaq Al-Sanjary*.

College of Medicine, University of Mosul, Mosul, Iraq.

Abstract.

Background: The rate of caesarean section has been increased globally all over the world and the type of anesthesia can affect both maternal and fetal health. For years the general anesthesia has been used as a method of choice during caesarean section with many complications especially in emergency caesarean section, were as spinal anesthesia, a type of regional anesthesia, that has been tried in the last two decades may provide anesthesia without these complication. **Methods:** A prospective randomized cohort study, performed in women health private hospital between Sep. 2023-Sep. 2024. for 200 term pregnant women attending for elective cesarean section, 100 women undergoes spinal anesthesia and 100 women undergoes general anesthesia. Those women with any risk factor that affect study parameters as preterm baby or placenta previa were excluded from the study.

Results: Data analysis shows non-significant difference in age and parity among the groups with no significant differences in systolic and diastolic blood pressure and pulse rate after operation the mean volume of intraoperative blood loss and the mean decline in hemoglobin is higher in general anesthesia group. **Conclusion:** Spinal anesthesia provides better outcome regarding lower intraoperative blood loss, less postoperative pain, higher fetal Apgar score at 1st minutes, with similar haemodynamic stability. It is a better option for cesarean section anesthesia reducing morbidity and mortality from the increasingly performed operation.

Key words. Spinal anesthesia, surgical anesthesia, caesarean section, obstetric.

Introduction.

Caesarean section (CS) operation is increasingly used for delivery. The ideal rate considered by the international health care community since 1985 was between 10-15%, there is a global increase since after, from 7% at 1990 to 21% at current time and it is expected to reach 29% at 2030 [1]. It is a lifesaving operation and should ensure a timely access to all obstetric patients when it is medically indicated [2]. Continuously increasing CS rate is mainly due to increased maternal preference and request and due to doctor convenience [1]. CS usually will improve maternal and fetal outcome as long as it is limited for medical and obstetric indication while performing it on maternal request at increasing rate will not add any benefit over vaginal birth, and if it was chosen as modern mode of delivery we should be ready to deal with the possible maternal and fetal future complication and about the associated increased in maternal and fetal morbidity and mortality rate at time of CS compared to vaginal delivery [3].

During CS there is an absolute demand for anesthesia with

inflated rate of CS this will likely impact the anesthetic obstetric workload and attribute to increased anesthetic mortality to obstetric patient. Anesthesia was responsible for 1% of direct cause of maternal mortality in UK, and it is related to 13.5% of maternal morbidity in Canada. Generally, the anesthetic complication is relatively lower in high income countries than others [4], in Malawi, a low resource setting, there was a high death burden after CS was observed [5]. Death from anesthesia is regarded as iatrogenic and current goal for CS anesthesia focus on any strategy that could improve women's comfort and fetal outcome [6].

Many factors related to the obstetric patient increase the risk of general anesthesia as obesity, preeclampsia and asthma, but a study revealed that the risk of death is multiplied by 2 and 1.9 during both gas induction and gas maintenance of general anesthesia, and during intubation with risk of hypoxia and pulmonary aspiration, respectively [7].

Actually, the incidence of failed intubation is higher in obstetric patient than in non- pregnant women 8 and the aspiration pneumonitis is one of the most serious if it is encountered during general obstetric anesthesia [8,9]. Neuroaxial anesthesia widespread use in obstetric anesthesia could avoid these complications during air way manipulation if it is used instead of general anesthesia [8].

When a women undergoes CS are exposed to risk of surgical complication and visceral organ injury, and increased blood loss usually ranges from 500-1000 ml [10]. Severe blood loss during CS is encountered in 7% of cases and postpartum haemorrhage is regarded as a leading to 27.1% for maternal mortality and the risk of bleeding during CS is higher than that in vaginal mode [11,12]. A study by Hosseinzadeh et al. (2023) reported that primary postpartum haemorrhage in 15.7% of obstetric patient undergone CS [13]. Excessive blood loss during CS may be due to the underlying indication for the operation by itself is a risk factor for increased blood loss as placenta previa, prolonged labor and twin, or it is due to technical injury experienced during CS especially with difficult fetal extraction [11,12]. Many risk factors were related to excessive blood loss during CS like multi-parity, presence of hypertension or diabetes, preoperative hemoglobin [13].

Estimation of blood loss during CS is important to be accurate in order to provide sufficient replacement if required, and to avoid unnecessary blood transfusion [14]. Estimation can be done visually and collecting the blood by suction into suction machine bottle added to it the weight of blood by weighting the packs and swabs dry before and soaked with blood after the operation and in addition measurement of hemoglobin before and day after operation provide accurate assessment for the hemoglobin deficit [15]. Globally neonatal mortality has been declined by more than 50% between 1990-2017, and many causes as low birth weight and prematurity, and birth asphyxia w can be prevented by improving access to safe obstetric practice [16]. Caesarean section is a good intervention that influence a better fetal outcome, and Apgar score estimation is important after birth as it is an indicator for neonatal wellbeing and health Apgar score at 1st minute reflect how is the baby doing after birth, while Apgar score at 5 minutes can be a predictor of mortality in the neonate. Low Apgar score has many detrimental factors like preterm birth; difficulty encountered during labor and type of anesthesia [17].

Caesarean section anesthesia has gained importance due to the increased incidence of this operation all over the world reaching 50% in some countries [18]. The type of anesthesia to be considered as general or regional type depends on patient clinical condition and clinical experience available patient preference. Regional anesthesia is considered the gold standard than general anesthesia although mortality related to general anesthesia was declined in the last decades and its safety is improved with no longer considered to have impact on maternal mortality [19], but still, it has 16.7-fold risk of regional anesthesia [20]. The study enrolled to determine the effect of spinal anesthesia on maternal and fetal outcome compared to general anesthesia, these outcomes, including Blood pressure, pulse rate, blood loss during CS, decline in hemoglobin, postoperative pain for mother and neonatal Apgar score for fetus.

Materials and Methods.

A randomized prospective cohort study, includes 200 women undergone elective caesarean section, in women health hospital in Mosul city from Sep 2023- Sep 2024. Women randomized into two groups: 100 with spinal anesthesia and 100 with general anesthesia.

Ethical approval: This study was approved by the medical research ethical committee in Mosul University (approval letter number: UOM/COM/MREC/22-23(23)/c, Date 20/6/2023). Each participant was discussed about the aim of the study to obtain consent form.

Inclusion criteria: Patients included were with 20-40 years, with 37 completed weeks of pregnancy, have no medical, obstetric nor fetal complication during pregnancy presented for elective cesarean section.

Exclusion criteria: Those with obstetric and medical diseases that increase blood loss during CS as hypertension, diabetes placenta previa and anemia, those with intraoperative complication as injury or placenta accrete. Those with obstetric complication as preterm delivery, intrauterine growth restriction or fetal distress as it will affect the Apgar score results.

Anesthetic techniques: The methods of anesthesia were chosen randomly, spinal and general type. In spinal anesthesia Marcaine 0.5% heavy solution (Bupivacaine hydrochloride) was used with Gray spinal needle, 27G (0.40mm) or Brown, 26G (0.45mm) avoiding risk of headache. Devomite, Atropine ephedrine and phenylephrine were used to overcome the hypotension and bradycardia commonly encountered by spinal anesthesia. General anesthesia provided by pentothal, induction of anesthesia by propofol, thiopental, and muscle relaxant

(atracurium besylate) was used to provide muscle relaxant and facilitate intubation, and maintenance by midazolam, fentanyl i.v. and by inhalation of isoflurane and emergence by giving reversal by atropine and neostigmine.

Caesarean section techniques: was done routinely with the same surgeon and same procedure with prophylaxis of 3rd stage by giving oxytocic drugs, 10 unit oxytocin was given to facilitate spontaneous placental separation and delivery and reduce blood loss, the blood loss will be suctioned and collected in graduated bottle, added to it the difference in weight of dry packs and swabs, and weighted after being soaked with blood, difference in weight in mg correspond to blood volume in ml. The total amount of intraoperative blood loss will be calculated in milliliter. The amniotic fluid is collected with another suction device. Apgar score of babies will be assessed at 1st and 5th minutes. Postoperative pain will be assessed and compared between the 2 groups. The hemoglobin will be checked before operation and 24 hours after calculating the decline in hemoglobin measured in gm /dl [14]. No blood transfusion is required nor administered; we only evaluated the amount of blood loss during surgery. The follow up limited on first minute Apgar score for fetus and 6 hours for mother after delivery for pain.

Statistical analysis: the study sample collected and randomized in to two groups spinal and general anesthesia groups, SPSS statistics software version 28 used for data analysis. Population analysis using t-test ANOVA test, LSD < 0.05.

Results.

200 obstetric patients complete their 37 weeks subjected to a planned cesarean section with 2 methods of anesthesia: spinal and general anesthesia.

Evaluation and analysis of their date was shown in (Table 1), there was no significant difference between both group regarding their mean age, parity and Hemoglobin value before the operation at p value (0.651; 0.508; and 0.846), respectively. The mean age was 30.38 ± 4.679 and 30.08 ± 4.685 in both spinal and general anesthesia groups. The mean number of parity were 2.66 ± 2.056 and 2.49 ± 1.527 in both spinal and general anesthesia groups. The mean values of hemoglobin (HB) were 11.37 ± 0.954 and 11.401 ± 0.943 in both spinal and general anesthesia groups.

Table 1. Baseline characteristics for both spinal and general anesthesia groups.

| Characteristics | Spinal anesthesia (n=100) | General anesthesia (n=100) | <i>p</i> value | |
|--|------------------------------|-------------------------------|----------------|--|
| Age | 30.38±4.679 | 30.08±4.685 | 0.651 NS | |
| Parity | 2.66±2.056 | 2.49± 1.527 | 0.508 NS | |
| HB before | 11.37±0.954 | 11.401±0.943 | 0.864 NS | |
| n: number of cases; SD: standard deviation; NS: not significant at p ≤ 0.05 . | | | | |

(Table 2) shows the results of both groups concerning their vital signs after the procedure these were systolic blood pressure, diastolic blood pressure and pulse rate. There was no significant difference between them with p values 0.498, 0.649, and 0.396, respectively. The mean systolic blood pressure after the cesarean section were 117.50 ± 8.303 , and 116.70 ± 8.355

mmHg and the mean diastolic blood pressure after cesarean section were 78.60 ± 7.788 , and 78.10 ± 7.745 mmHg, and the mean pulse rate after the cesarean section were 94.30 ± 6.144 and 95.02 ± 5.815 beat / min., respectively in both spinal and general anesthesia groups.

Table 2. Baseline characteristics of vital signs for both spinal and general anesthesia groups.

| Characteristics | Spinal anesthesia (n=100) | General anesthesia (n=100) | <i>p</i> value |
|--------------------------------|---------------------------------|----------------------------------|----------------|
| Systolic blood pressure after | 117.50±8.303 | 116.70±8.355 | 0.498 NS |
| Diastolic blood pressure after | 78.60±7.788 | 78.10±7.745 | 0.649 NS |
| Pulse rate after | 94.30±6.144 | 95.02±5.815 | 0.396 NS |

(Table 3) shows that the results maternal and fetal outcome in both groups. there were significant differences between both groups spinal and general anesthesia in the values of mean amount of intra operative blood loss 405.60 ± 235.133 ml and 574.85 ± 259.608 ml in both spinal and cesarean section groups with highly significant difference at p value<0.001, the decline in hemoglobin were 0.6740 ± 0.290 mg/dl and 0.768 ± 0.315 mg/ dl in both spinal and cesarean section groups with significant difference at p value at 0.029.

Table 3. Material and fetal outcome in both spinal and general anesthesia groups.

| Characteristics | Spinal anesthesia (n=100) | General anesthesia (n=100) | <i>p</i> value |
|---------------------------------|---------------------------------|----------------------------------|----------------|
| Blood loss in ml | 405.60±235.133 | 574.85±259.608 | <0.001 HS |
| HB decline | 0.6740 ± 0.290 | 0.768±0.315 | 0.029 Sig |
| Apgar score at the first minute | 7.040±0.875 | 5.370±0.981 | < 0.001 HS |

Neonatal Apgar score for delivered fetuses at first minute were 7.040 ± 0.875 and 5.370 ± 0.981 in both spinal and general anesthesia groups, with highly significant differences at p value < 0.001.

(Figure 1) below shows multiple line for the estimated blood loss during CS with higher values in general anesthesia compared to spinal group, and Figure (2) shows multiple lines with higher Agar score in the spinal anesthesia compared to general type.

Table 4. Postoperative pain frequency in both spinal and general anesthesia groups.

| Postoperative pain | Frequency in spinal anesthesia (n=100) | Frequency in general anesthesia (n=100) | <i>p</i> value |
|---------------------|--|---|----------------|
| No pain | 28 | 0 | |
| Mild | 56 | 26 | < 0.001 |
| Moderate | 16 | 49 | HS |
| Sever | 0 | 25 | 1 |
| n: number of cases; | HS: highly significa | ant at $p \leq 0.01$. | |



Figure 1. Multiple lines for estimated of blood loss during spinal and general anesthesia groups.



Figure 2. Multiple lines for Apgar score at first minute for both spinal and general anesthesia groups.

(Table 4) cover the postoperative pain after the operation for both spinal and general anesthesia groups. Pain described as no pain, mild, moderate and sever. There were a highly significant differences between the groups at p value<0.001, spinal anesthesia group, 28% do not elicit any pain after surgery while 56% might describe some pain and 16% suffer from moderate pain after the end of the procedure, no one describe severe form of pain. While general anesthesia 25% suffer from severe pain and 49% suffer from moderate pain and 26% suffer from mild pain, all cases suffer from pain and no one had no pain.

Discussion.

Caesarean section is commonly performed worldwide by Spinal anesthesia as it is regarded as the gold standard for CS, general anesthesia is uncommon currently in performing cesarean section and, performed in emergency cases and in when it is preferred by the patient, only up to 20 % of world obstetric patients still undergoes cesarean section with general anesthesia [21,22]. Most of patients in our locality resist spinal anesthesia, however, the new current attitude toward use of spinal enable researcher to enroll these patients included in this study with most of them it is their first experience. Perhaps enrolled patients in this study were candidate for both spinal and general anesthesia and the choice of anesthesia used were depend on patients counselling and patient satisfaction for choosing spinal anesthesia after explanation and discussion of the advantaged of spinal anesthesia. However, the general anesthesia type it was the usual type used and patient were used to have, therefore, patients' direction for specific anesthesia indication to one type of anesthesia or have contraindication for the other were excluded from the study regardless the type of anesthesia.

The study sample was chosen randomly as elective CS with normal weight, no hypertension nor diabetes, they have no significant differences regarding the age, parity, hemoglobin level before operation a feature that could increase blood loss during operation [13].

Evaluation of vital signs between both groups shows no significant difference with in systolic (p value 0.498) and diastolic blood pressure (p value 0.649) and pulse rate (p value 0.396) after the operation. Hypotension related to spinal anesthesia is commonly occurring in old age (75% is risk in over 50 years) less in young women (36% of cases), and it varies according to the degree of sympathetic nerve block, leads to vasodilatation in the areas concerned with block with reflex increase in body arterial tone this compensatory mechanism is more effective in young age. Ephedrine or phenylephrine as a vasoconstrictor can mobilize the pooled blood in the venous circulation, in addition systemic preloading with I.V. fluid bolus over 5-10 minutes before spinal anesthesia, to prevent hypotension during spinal anesthesia [22]. These measures were practiced in our study minimizing spinal induced hypotension and explain why no significant differences in systolic and diastolic blood pressure between spinal and general groups postoperatively.

A study by Sung et al. (2021), describe a significant difference between blood pressure measurements being higher in the general than spinal type of anesthesia. Also pulse rate was higher in general than spinal groups [23]. This different results from our study were probably due to different dose of anesthetic drug used, different preoperative preparation and or different type of study groups. Bradycardia may develop during spinal anesthesia should occur it can be corrected by giving atropine which was also practiced in the study groups and may contribute to similar mean pulse rate between the groups in our study [23].

Obstetric haemorrhage prevention during CS is essential in lowering morbidity and mortality. Obstetrician may underestimate blood loss by 50 % and this may result into lower level of blood volume and lower hemoglobin causes orthostatic changes and affecting body function especially the kidneys and subject patient to increased morbidity. Proper estimation of blood loss during CS reduces a major cause of maternal morbidity, and avoids unnecessary blood transfusion. In our study a lower volume of blood loss was observed and a lower Hb decline in spinal compared to general type of anesthesia, this was similar to results of many studies [23,24].

Prevention of obstetric hemorrhage during CS should be considered and of our concern by avoiding general anesthesia which is associated with excessive blood loss due to defective uterine contraction and disturbed platelet function as a result of exposure to anesthetic drugs used during general anesthesia [25]. Anesthetic drugs mainly volatile gases inhibit uterine muscle spontaneous contraction in a dose dependent manner and thus prevent closure of the vascular plate predispose to increased blood loss and postpartum hemorrhage [26].

Fetal well-being after cesarean section is best evaluated by 1-minute Apgar score, this is important to evaluate the impact of operation on the fetal wellbeing, in the current study Apgar score was lower in patients with general than spinal anesthesia this goes with the result of many studies like that by Sung et al. (2021), when it is reported a larger proportion of those with Apgar scores <7 were in the general than spinal group and recommend to use spinal anesthesia in CS especially in preterm babies [23]. Also, similar result given by Gwanzura et al. (2023), study concluded that care should be taken to avoid general anesthesia during CS as newborn babies exposed will have a lower Apgar score at 1st minute (although the majority will have normal score at 5 minutes). Spinal anesthesia used during CS, will have neonates with higher Apgar scores and therefore it should be used as first choice especially in emergency when the neonate is exposed to stress [27]. A study by Iqbal et al. (2024) found that there were better means of 1 min fetal Apgar scores in spinal type compared to general anesthesia and that general anesthesia increase the needs for neonatal resuscitation [28].

Pain is sensory experience most frequently encountered after surgery as inevitable part of wound healing process. Neglecting postoperative pain leads to clinical and also psychological changes that could impair patient life quality, and could predispose to patient morbidity and mortality, so it is vital reduce postoperative pain and one, is to use spinal anesthesia [29]. According to our study results, spinal anesthesia use has lower pain with 84% have no or mild pain immediately after surgery while in general anesthesia 74% have moderate to severe pain.

Spinal anesthesia is recommended for elective CS rather than general anesthesia with >95% of CS in United States, and Canada were performed by spinal anesthesia as it has lesser complication. General anesthesia carries higher maternal and fetal morbidity and should be reserved for those cases with failure or contraindication to spinal anesthesia, extremely urgent operation or on patient request [30].

Conclusion.

Our study shows improved obstetric outcome both maternal and fetal outcome during elective caesarean section operation in spinal anesthesia compared to general, concerning lower intraoperative blood loss and lower hemoglobin decline with reasonable vital signs and hemodynamic state, there is a better pain control and improved fetal outcome and better Apgar score at 1st minute in spinal than general anesthesia. This study is important to influence obstetric decision and choice during caesarean section operation.

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