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Editorial

What is plagiarism and how to avoid it?

Plagiarism is regarded as academic dishonesty and a violation of ethical standards. Plagiarism is not inherently a crime, although it may amount to copyright infringement. In academics, it constitutes a grave ethical transgression. Plagiarism is penalized by institutions rather than by legal statutes. Professional societies, educational institutions, and publishing companies may impose penalties, suspensions, and even expulsions on authors.[1]

Plagiarism originates from the Latin term "plagiarius," signifying "kidnapper," one who abducts a child.[2] The term plagiarism was incorporated into the Oxford English Dictionary in 1621. According to the Encyclopedia Britannica, plagiarism is described as "the act of taking the writings of another person and passing them off as one's own."[3] It constitutes forgery, piracy, and fraud, and is seen as a grave offense inside academia.[4] This also constitutes a breach of copyright legislation. Honesty in scientific practice and publication is essential. The World Association of Medical Editors (WAME)[5] defines plagiarism as "... the use of others' publishedand unpublished ideas or words (or other intellectual property) without attribution or permission andpresenting them as new and original rather than derived from an existing source."

Plagiarism can be either intentional or unintentional. Acquiring, borrowing, or employing another's work, whether in part or completely, without appropriately acknowledging the original author constitutes intentional plagiarism. Utilizing others' work with incorrect paraphrase or inadequate citation constitutes unintentional plagiarism.[6,7]

Following are the most common forms of plagiarism seen in most of the research publications:

1. Plagiarism of ideas:When an author takes the ideas or concepts of others and presents them as their own without adequately crediting the original creators, it amounts to a form of intellectual theft.[8]
2. Plagiarism of text/direct plagiarism/word-for-word plagiarism: Roig defines this type of plagiarism as "the act of copying a segment of text from another source without attributing it to its author and without enclosing the borrowed text in quotation marks."[8]
3. Mosaic plagiarism (patchwork plagiarism): When an author doesn't use his own words and "copies the same words, phrases, or paragraphs from the original source" without giving credit, this is called mosaic plagiarism.[9]
4. Self-plagiarism: One commits self-plagiarism when they "steal or borrow some amount of work" from their own published works.[10]

How to avoid plagiarism?

Removing plagiarism isn't a rocket science.There are five steps to avoid it:

1. Use plagiarism checkers:
Here are several plagiarism detections tools that assist in identifying matching text within articles submitted by authors.[11,12]

(i) Cross Check™ (ii) http://www.ithenticate.com (iii) https://turnitin.com/static/index (iv) Viper (http://www.scanmyessay.com/plagiarism - free software) (v) Software like eTBLAST (vi) SafeAssign™ (vii) WCopyFind™ (viii) http://www.checkforplagiarism.net (ix) http://www.grammarly.com (x) Sometimes simple Google Search also helps in detecting plagiarism.

2. Paraphrase:
'Paraphrase' refers to the modification of the words and phrases in a text while preserving its original meaning and intent.

3. Use quotes:
Incorporating quotations is an effective method to prevent plagiarism in scientific writing.

4. Add citations and references:
Similar to quotes, citations and references serve to reduce plagiarism. These are employed for assigning credit to the original source or author, so averting the duplicated segment in research from being classified as plagiarism. Various citation styles are available, including APA, MLA, Chicago, and Harvard.

5. Use hyperlinks:
Hyperlinking serves as a method to credit a specific fact or piece of information to its original source. Hyperlinks are exclusively applicable in online content, or more accurately, digital content. Typically, hyperlinks are incorporated into particular words within the text. The associated terms are typically highlighted in blue and feature an underline.[13]

How to deal with plagiarism?
Editors are required to respond appropriately when there are suspicions of misconduct involving authors, reviewers, editorial staff, or fellow editors, as outlined by the COPE guidelines. This requirement includes both manuscripts that have been published and those that remain unpublished. The accused individuals provide an initial response to the editors. The editors should ask the employers of the authors, reviewers, editors, or any other relevant institution to look into the matter and take appropriate action if they are displeased with the response.[14] The editor should at the very least "reject" the manuscript if it is at a different stage of the editorial process and "retract" it if it has already been published if they find plagiarism.

Plagiarism has emerged as a critical concern in the composition of scientific papers. Many writers are unaware that plagiarism constitutes a significant issue. Plagiarism can vary from small dishonesty, such as trivial copying and pasting, to more severe issues, including significant discrepancies or manuscript duplication. Plagiarism typically occurs when authors copy and paste from the original source without providing proper attribution to the primary source. Utilizing an appropriate online plagiarism detector and an excellent paraphrase tool enables us to prevent plagiarism efficiently. We must enhance knowledge regarding plagiarism and ethical concerns among our researchers and authors. When conducting research, we must be truthful and refrain from breaking any copyright laws.

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Instruction for Authors:

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Dealing with human subjects relating to ethical aspects should be in accordance with WMA Declaration of Helsinki-Ethical Principles for Medical Research Involving Human Subjects revised in 2008 (www.wma.net/en/30publication/10policies /b3/). Evidence for approval by the local ethics committee must be supplied by the authors on demand.

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The journal aspects manuscripts prepared under the guidelines of International Committee of Medical Journal Editors (ICMJE) (www.icmje.org). Authors are requested to follow the following general framework-

a) Manuscript written in English and typed on one side of A4 size white paper.
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c) Double spacing should be used throughout .
d) Five cm margin for the header and 2.5 cm for the remainder.
e) Vancouver referencing style approved by U.S. National Library of Medicine (NLM) is preferred though Harvard style and others may also be submitted.
f) Pages are to be numbered consecutively at the lower end of each page beginning with the title page.
g) All scientific units should be expressed in System International (SI) units. Traditional units may be used where they are widely accepted.
h) All drugs should be mentioned in their generic form. The commercial name may however be used within brackets.

Each of the following section should begin on separate page-

- Title page
- Abstract
- Text (Introduction, Materials and method, Results, Discussion). Insert tables and legends where they fit.
- Acknowledgement (if applicable).
- References.

Title Page

Title of the article (Should be concise, informative and self explanatory).
Name and email address of the author to whom correspondence regarding manuscript to be made.
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Abstract

May be structured with subheadings of Background Objective, Materials and Method, Results, Conclusion. Not mandatory for review articles and case reports.
Should not exceed 250 words.
Three to five keywords below the abstract may be used.

Text

Introduction

States the purpose of the article and summarizes the rational of the study.
Brief review of the subject.

Materials and method

Should be very clear mentioning study design, place and period.
The selection criteria of the study population including controls (if any).
The methods and the apparatus used in the research.
The procedure of the study in such a detail so that other workers can reproduce the results.
Statistical procedure should be briefly and comprehensively addressed. Specify the computer software used (if any) along with version.

Results

Presented in sequence in the text, tables and illustrations.
Describe without comment.
Supplemented by concise texual description of the data presented in table and figures only where it is necessary.

Table

Tables should be simple, self explanatory and supplement, not duplicate the text.

They should be numbered consecutively with Roman numerical(I, II, III,IV,etc) in order of text.

If abbreviations are to be used, they should be explained in footnotes.

Captions should in bold (Table I: .....)

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All illustrations must be numbered and cited in the text.

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Should reflect the authors' comment on the results and to relate them to those of other authors.

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Acknowledgement

Individuals, organizations or bodies may be acknowledged in the article and may include-

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Genaud G, Spierings EL, Keywood C. Tolerability and safety of Frovatriptan with Short and Long Term Use for Treatment of Migraine and in Comparison with Sumatriptan. Headache. 2009;25 supple: 541-47

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Homepage/Web site

Cancer-Pain.org [Internet]. New York: Association of Cancer Online Resources [updated 2002 May 16; cited 2002 Jul 9]. Available from: http://www.cancer-pain.org/.

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ORIGINAL ARTICLE

Diagnosis of chronic calculus cholecystitis using ultrasonography and co-related with per operative findings and histopathological findings in adult

Jamal Abdul Naser[1*], Md. Afzal Hossain[2], Shamima Jahan[1], Md. Aminullah[3], Farjana Basher Annee[4]

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Abstract

Background: Gall bladder diseases are most commonly secondary to cholelithiasis. While most cases of gall stones are asymptomatic, some cases may progress to severe symptomatic disease occasionally into malignancy. Early and accurate diagnosis allows prompt treatment and reduces both morbidity and other complications.

Objectives: To access the clinical diagnosis of chronic cholecystitis using ultrasonography and co-relation with per operative findings and histopathological examination findings.

Methods: This is a descriptive type of observational study which was conducted at department of Surgery. Dhaka National Medical College Hospital, over a period of 12 months from 6th December 2017 to 5th December 2018. Total 150 patients clinically diagnosed of chronic cholecystitis with laboratory profile, imaging proven in surgery department of Dhaka National Medical College Hospital were included.All patient underwent laparoscopic cholecystectomy but few patients needed conversion into open cholecystectomy due to severe adhesion with surrounding structures. Resected gall bladder was sent for histopathological examination. Comparison was done by tabulation and graphical presentation in the form of tables, pie chart, bar diagrams etc.

Results: In this study. Ultrasonography findings revealed that, gallbladder size was normal in 97(64.66%), contracted in 47(31.33%), distended in 6(4%) patients. Most of the patients gall bladder wall thickness was within normal limit (1-3 mm)found in 137(91.33%) who is diagnosed clinically as a case of chronic calculus cholecystitis. Thick wall gall bladder found in 13(8.66%) patients. Gallbladder contains multiple stone in 99(66%), single stone in 32(21.33%), biliary sludge in 19 (12.66%) patients. Both Wall-Echo-Shadow and Peri-cholecystitic fluid was present in 4(2.6%) patients separately. Per operatively, Gall bladder found distended in 9(6%) patients among them 7(4.66%) were mucocele and 2(1.33%) were empyema. Normal sized gall bladder found in 92 (61.33%) and contracted in 49(32.66%) patients. Normal wall thickness found 126(84%) patients and rest 24(16%) had thick gall bladder wall. Gallbladder contains multiple stone in 102(68%) patients. Single stone and biliary sludge found in 29(19.33%) and 19(12.66%) respectively. No adhesion presents in 39(26%) cases and adhesions in Callot's triangle found in 47.33%. Adhesions with inferior surface of liver, non visualisation of Callot's triangle anatomy and partially intrahepatic gall bladder found in 14.66%, 09.33% and 02.66% patients respectively. Due to difficulty, 7(4.66%) cases need to convert into open cholecystectomy. Histopathological findings revealed that, 135 (90%) specimens showed evidence chronic cholecystitis, 9.33% acute cholecystitis. Only 1 (0.66%) gallbladder showed evidence of adenocarcinoma of papillary variety along with cholelithiasis.

Conclusions: Ultrasonography is a good diagnostic tool in the diagnosis of chronic calculus cholecystitis and can be used at all level of health care center. All the cholecystectomy specimens operated for symptomatic gall stone diseases are must sent for histopathological examination to rule out incidental gall bladder carcinoma.

Keywords: Chronic calculus cholecystitis, ultrasonography, histopathological examination.

Introduction

Chronic calculus cholecystitis is the predominant benign disease of the gallbladder, commonly observed in middle-aged females.[1] Chronic cholecystitis nearly invariably occurs in conjunction with cholelithiasis. Approximately 20 million individuals in the USA are afflicted with gallstones, resulting in over one million hospital admissions and 700,000 surgical interventions annually.[2] Gallstones are found in roughly 6.5% of males and 10.5% of females.[3] The incidence of gallstones escalates with advancing age. By age 70, 15% of men and 24% of women possess gallstones, with these figures rising to 24% and 35%, respectively, by age 90.[4] Chronic calculus cholecystitis is a prevalent illness necessitating surgical intervention and is typically linked to numerous consequences if not addressed. More than 70% of individuals with gallstones exhibit no symptoms.[5] Most stones are unintentionally discovered during normal abdominal ultrasonography.[6] The annual chance of experiencing symptoms or consequences associated with gallstones is roughly 1–4%.[7] The predominant consequences of gallstones encompass biliary colic, acute cholecystitis, common bile duct stones, and gallstone pancreatitis.[8] The most prevalent manifestation of gallstone disease is biliary colic pain. The pain commences abruptly in the epigastric area or right upper quadrant and may extend to the back in the interscapular region.[9] Intolerance to fatty foods and flatulent dyspepsia are prevalent. Patients may occasionally exhibit fever, nausea, vomiting, anorexia, jaundice, and abnormal intestinal transit. Accurate diagnosis of "symptomatic" gallstone patients is crucial, as the primary justification for cholecystectomy is an episode of pain. The diagnosis is corroborated by results from abdominal ultrasonography and laboratory tests.[10]

Gallbladder disease is generally diagnosed using imaging techniques. These diagnostic approaches possess advantages and disadvantages, and their accuracy significantly fluctuates. A particular approach may be favored over another based on the specific gallbladder illness or the symptoms exhibited.[11] Transabdominal ultrasonography is the definitive method for diagnosing gallbladder stones.[11] The method is non-invasive, readily accessible, and demonstrates exceptional sensitivity and specificity (exceeding 95%) for identifying gallstones larger than 2 mm.[8] Ultrasonography offers supplementary data regarding stone dimensions, quantity, and mobility within the gallbladder.[12] The gallbladder volume and wall thickness, specifically a diffuse thickening of the gallbladder wall exceeding 3 mm, may be observed in cases of acute or chronic cholecystitis.[13]

Cholecystectomy, conducted via either laparoscopic or open technique, is the final treatment for cholecystitis in the United States.[14] Laparoscopic cholecystectomy is increasingly utilized as the treatment for cholecystitis, associated with reduced morbidity, mortality, hospital duration, and costs compared to open cholecystectomy. Complications of laparoscopic cholecystectomy included bile duct injury, intestine and vascular injuries, postoperative bile leak from the cystic duct, conversion to open cholecystectomy, port site wound infection, and port site hernia.[15]

Histopathological examination findings are crucial for the confirmed diagnosis of chronic calculus cholecystitis and are important to exclude malignancy. Notwithstanding significant advancements in addressing gastrointestinal tumors, gallbladder cancer continues to be a malignancy with a dismal prognosis. In addition to its aggressive biological behavior, the absence of screening methods and dependable biomarkers for early detection significantly contribute to the typically delayed diagnosis of gallbladder cancer, often discovered incidentally following cholecystectomy.[16]

Materials & Methods

A hospital based descriptive type of observational study was conducted over a period of twelve months from 6th December 2017 to 5th December 2018 in the Department of Surgery, Dhaka National Medical College Hospital after obtaining requisite consent from the patients. Total 150 patients clinically diagnosed as chronic calculus cholecystitis with proper history taking, physical examination, laboratory profile, ultrasonography proven in surgery department of Dhaka National Medical College Hospital were enrolled for this study. Patient investigations report and ultrasonography report were observed. Patients underwent laparoscopic cholecystectomy and per operative findings were co-related with

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ultrasonography report and specimen (resected gall bladder) was sent for histopathological examination. Histopathology report was observed and co-relation done with clinical diagnosis. The gathered data were input into the computer and analyzed utilizing SPSS (version 20.1).

Results

Table-I: Ultrasonographic findings of chronic cholecystitis patients (n=150)

USG findings	Number of patients	Percentage (%)
Gall bladder size:		
Normal:	97	64.66
Contracted:	47	31.33
Distended:	06	04
Wall thickness of gallbladder:		
1-3 mm	137	91.33
>3 mm	13	8.66
Gallbladder content:		
Biliary sludge	19	12.66
Single stone	32	21.33
Multiple stone	99	66
Wall-Echo-Shadow of gall bladder	04	2.6
Peri-cholecystitic fluid collection	04	2.6

Ultrasonography findings revealed that, gallbladder size was normal in 97(64.66%), contracted in 47(31.33%), distended in 6(4%) patients. Most of the patients gall bladder wall thickness was within normal limit (1-3 mm)found in 137(91.33%). Thick wall gall bladder found in 13(8.66%) patients. Gallbladder contains multiple stone in 99(66%), single stone in 32(21.33%), biliary sludge in 19(12.66%) patients. Both Wall-Echo-Shadow and Peri-cholecystitic fluid was present in 4(2.6%) patients seperately.

Table-II: Per operative findings of laparoscopic cholecystectomy (n=150)

Per operative findings	Number of patients	Percentage (%)
Gall bladder size:		
Normal:	92	61.33
Contracted:	49	32.66
Distended:	09	06
Wall thickness of gallbladder:		
Normal	126	84
Thickened	24	16
Gallbladder content:		
Biliary sludge	19	12.66
Single stone	29	19.33
Multiple stone	102	68
Adhesion with surrounding structures:		
No adhesion	39	26
Adhesions in Callot's triangle	71	47.33
Adhesions with inferior surface ofliver	22	14.66
Non visualisation of Callot's triangle anatomy	14	09.33
Partially intrahepatic GB	04	02.66
Mucocele	07	4.66
Empyema	02	1.33
Needs to convert into open cholecystectomy	07	4.66

All 150 patient underwent laparoscopic cholecystectomy. Gall bladder found distended in 9(6%) patients among them 7(4.66%) were mucocele and 2(1.33%) were empyema. Normal sized gall bladder found in 92 (61.33%) and contracted in 49(32.66%) patients. Normal wall thickness found 126(84%) patients and rest 24(16%) had thick gall bladder wall. Gallbladder contains multiple stone in 102(68%) of patients. Single stone, biliary sludgefound in 29(19.33%) and 19(12.66%) respectively. No adhesion presents in 39(26%) cases and adhesions in Callot's trianglefound in 47.33%. Adhesions with inferior surface of liver, non visualisation of Callot's triangle anatomy and partially intrahepatic gall bladder found in 14.66%, 09.33% and 02.66% patients respectively. Due to difficulty, 7(4.66%) cases need to convert into open cholecystectomy.

Table-III: Histopathological findings of the patients (n=150)

Histopathological findings	Number of patients	Percentage (%)
Evidence of chronic inflammation with variable mucosal changes and metaplastic change	135	90%
Oedematous gall bladder with features of acute inflammation.	14	9.33%
Adenocarcinoma of varying differentiation along with cholelithiasis	1	0.66%

135 (90%) specimens showed evidence chronic cholecystitis, 14(9.33%) acute cholecystitis. Only 1 (0.66%) gallbladder showed evidence of adenocarcinoma of varying differentiation along with cholelithiasis.

Figure-I: Pattern and type of calculus cholecystitis according to histopathological findings (n=150)

Total 149(99.33%) of patients proven benign causes of calculus cholecystitis by histopathology findings and 1(0.66%) was malignant cause.

Table-IV: Co-relation of ultrasonographic features of chronic calculus cholecystitis and histopathological feature (n=150)

Ultrasonographic finding	Histopathological feature			p-value
Gall bladder wall thickness	Features of chronic inflammation	Features of acute inflammation	Features of malignancy	
1-3 mm = 137	133	4	00	<0.00001
>3 mm = 13	2	10	01	<0.00001
Total = 150	**135**	**14**	**01**	

Result shows relation of Ultrasonographic features of chronic calculus cholecystitis with histopathological feature. Amongst the 137 patient's sonography result, 133 patient shows chronic cholecystitis is consistent with histological findings and 4 patients shows features of acute inflammation who might have acute on chronic cholecystitis. Among 13 cases of thick wall gall bladder, 2 cases found chronic inflammation, 10 cases found features of acute inflammation which might be due to recent acute attack is consistent with histopathology result. Single case found features of malignancy in histopathology and gall bladder wall of that patient was thick. The chi-square statistic is 89.012. The p-value is 0.00001. This result is significant at p< .00001. So ultrasonographic finding is significant in evaluation of chronic calculus cholecystitis.

Discussion

Gallstones are found in roughly 8% of the population, and several individuals possess tiny gallstones without exhibiting any symptoms. Merely 10-20% of these individuals will exhibit symptoms. In this study, Ultrasonography findings revealed that, gall bladder size is normal in 97(64.66%) and contracted in 47(31.33%), distended in 6(4%) of the patients. Most of the patients gall bladder wall is within normal limit (1-3 mm) found in 137(91.33%)patients suggestive of chronic cholecystitis and thick-walled gallbladder was found in 13(8.66%) patients. Gall bladder contains multiple stone in 99(66%), single stone in 32(21.33%), biliary sludge in 19(12.66%) patients.

The findings align with the results of a study conducted in Bangladesh. Hasan MM et al. reported that patients with cholecystitis were assessed with sonography to ascertain wall thickness. 36 (12%) individuals exhibited thick-walled gallbladders, while 10 (3.33%) patients presented with constricted gallbladders. The incidence of cancer was elevated (84.62%) in patients with a thick-walled gallbladder.[17] Ultrasonography is the preferred approach for examining the gallbladder, demonstrating good sensitivity in identifying wall thickening. The ultrasonographic findings in the early stages of gallbladder cancer are modest and significantly overlap with those of acute and chronic cholecystitis. Characteristics such as a thicker gallbladder wall, gallbladder stones or CBD stones, a gallbladder mass, and a pericholecystic collection may be observed in both benign gallbladder conditions and gallbladder malignancies.[18] Intra operatively adhesions (47.33%) were significantly more with calot's triangle and inferior surface of liver (14.66%). Difficulties during procedure such as non visualisation of Callot's triangle anatomy (09.33%), partially intraparechymalgallbladder (02.66%), mucocele (04.66%) and empyema (01.33%) were found. Due to difficulties, needs to convert into open cholecystectomy 7(4.66%) cases. Gall bladder carcinoma is the most common malignancy of the biliary tract and the sixth most common malignancy of the gastrointestinal tract worldwide.[19]

As a result of the aggressive nature of the disease and the late onset of symptoms, the majority of patients are diagnosed at an advanced stage. The prognosis is often unfavorable, with reported five-year survival rates below 5%.[20,21] The initial phase of carcinoma is usually identified accidentally due to inflammatory symptoms associated with concurrent cholelithiasis or cholecystitis.[22] The challenges in preoperative diagnosis of gallbladder carcinoma have led to a rise in accidental instances of gallbladder carcinoma during and following laparoscopic cholecystectomy.[22, 23] The literature review indicated that 0.19% to 3.3% of patients who underwent laparoscopic cholecystectomy for cholelithiasis were diagnosed with gallbladder cancer.[24-27] A study of laparoscopic cholecystectomy

cases in Kolkata, India, found an incidence of 0.59% for incidental gallbladder cancer.[28] In our study, 135 (90%) of the specimens exhibited indications of chronic cholecystitis, while 14 (9.33%) demonstrated acute cholecystitis. Only one gallbladder (0.66%) had indications of adenocarcinoma with varied degrees of differentiation, accompanied with cholelithiasis. In total, 149 patients (99.33%) were diagnosed with benign causes of calculus cholecystitis based on histopathological findings, whereas 1 patient (0.66%) was identified with malignant causes.

Conclusion

Chronic calculus cholecystitis is a common problem in surgical practice. For early diagnosis accurate history taking, clinical examinations and investigations are vital. Ultrasonography is a good initial investigation for diagnosis of gallbladder diseases. In spite of normal ultrasonography report, severe adhesion can be found during operation and have to convert into open cholecystectomy. It is a standard practice that all the cholecystectomy specimens operated for symptomatic gall stone diseases are sent for histopathological examinationas incidental gall bladder carcinoma can be found.

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ORIGINAL ARTICLE

Perinatal Outcome of Oligohydramnios in tertiary level hospital

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Abstract

Background: Oligohydramnios is being an upcoming challenge both for obstetrician and for pediatricians. Its incidence is 2.3% of all the pregnancies. It is often associated with post term pregnancy, premature rupture of membrane (PROM), intra uterine growth retardation (IUGR), congenital malformation, renal agenesis, obstructed uropathy etc. So, it is very important to assess amniotic fluid index (AFI) to find out the high-risk group of oligohydramnios.

Objective: To assess the effect of oligohydramnios on perinatal outcome.

Methods: This cross-sectional observational study was conducted at the Department of Obstetrics and Gynaecology of Dhaka National Medical College Hospital from April to September in 2019. Fifty-eight women admitted with isolated Oligohydramnions at term irrespective of their parity were included for the study subjects. The computer-aided statistical software SPSS version 22 was used to analyze the data that was collected through a pre-formed questionnaire. Tables and graphs were used to present the data.

Result: This study showed that among study group 42(72.4%) had borderline oligohydramnios and 16(27.6%) had severe oligohydramnios. In severe oligohydramnios group caesarean section was significantly higher than borderline oligohydramnios group. 20.7% were normal vaginal delivery, 3.4% were assisted vaginal delivery and 75.9% were caesarean section. Among 58 patients 29.3% were post term deliveries (41 to 42 completed weeks); 70.7% patients were delivered by 37 to 40 completed weeks. 39.7% babies had suffered from neonatal complications. Among them 22.4% suffered from birth asphyxia, 12.1% from meconium aspiration syndrome. Early neonatal death was 3.4% and still birth was 1.7% mainly due to severe birth asphyxia. Alive take home newborn were 94.8%. Among 55 alive babies, 41.8% babies were admitted in neonatal ICU.

Conclusion: Oligohydramnios was responsible for a significantly higher rate of LUCS due to fetal distress at term. Neonatal morbidity like admission in neonatal ward was 41.8% in women with oligohydramnios. Oligohydramnios was increasingly linked to perinatal and neonatal complications. Consequently, each case of oligohydramnios requires meticulous assessment, and appropriate preventive and therapeutic interventions should be implemented accordingly.

Key words: Perinatal outcome, Oligohydramnios, Amniotic fluids.

Introduction

Oligohydramnios is defined as a condition in which the volume of amniotic fluid is insufficient, namely less than 200 mL at term. An accurate diagnosis of oligohydramnios can be achieved sonographically through the ultrasonographic assessment of the amniotic fluid index (AFI) between 20 and 40 weeks of gestation.[1-3] In ultrasonography, a normal Amniotic Fluid Index (AFI) ranges from 8.1 to 20 cm; an AFI between 5 cm and 8 cm indicates moderate oligohydramnios, whereas an AFI of 5 cm or less signifies severe oligohydramnios. The amniotic fluid encasing the fetus fulfills multiple functions throughout gestation. It facilitates musculoskeletal

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development, encourages appropriate fetal lung maturation, and prevents umbilical cord compression. Oligohydramnios impacts roughly 3.9% of all gestations.[4-6] Oligohydramnios is a significant obstetric issue that contributes to perinatal death and morbidity.[3]

Pregnancies complicated by oligohydramnios face a heightened risk of unfavorable perinatal outcomes. Certain studies indicate a robust association between low birth weight in infants and oligohydramnios. Oligohydramnios correlates with a heightened likelihood of cesarean delivery due to fetal discomfort, primarily resulting from head and cord compression.[7-8] Reduced amniotic fluid volume indicates placental insufficiency and serves as a risk factor for fetal growth restriction.[9] Approximately 60% of fetuses with intrauterine growth restriction (IUGR) exhibit reduced amniotic fluid volume. A study indicated that oligohydramnios correlates with meconium staining of amniotic fluid, resulting in heightened occurrences of respiratory distress syndrome, higher NICU admissions, and severe perinatal impairment among affected infants.[10-12]

The Amniotic Fluid Volume (AFV) progressively rises during the majority of pregnancy, starting at approximately 30 ml at 10 weeks gestation and reaching a maximum of around 1 L between 34- and 36-weeks' gestation. Amniotic fluid volume (AFV) diminishes during the late third trimester, averaging 800 ml at 40 weeks gestation.[13] The volume of normal amniotic fluid fluctuates. The mean volume escalates with gestational age, reaching an optimal level of 800-1000 ml at 36-37 weeks of gestation.

Oligohydramnios, characterized by an Amniotic Fluid Index (AFI) below 5 centimeters, may indicate several complications during gestation, such as chromosomal anomalies, preterm rupture of membranes, renal dysfunction, and placental insufficiency.[14] It is linked to negative prenatal outcomes such as perinatal mortality, meconium aspiration syndrome, irregular fetal heart rate, and the necessity for surgical procedures during childbirth.[14] Oligohydramnios in intrauterine growth restriction (IUGR) signifies fetal distress, as it demonstrates the diversion of blood flow to save essential organs.[15-17] This disorder frequently results in elevated labor induction rates, more common fetal heart rate decelerations, reduced birth weights, and an increased prevalence of meconium aspiration syndrome.[18] Accurate diagnosis and surveillance, coupled with prompt intervention, are essential for enhancing perinatal outcomes in instances of oligohydramnios. Frequent AFI evaluations throughout the antepartum phase might facilitate the identification of high-risk cases and inform suitable therapy, hence decreasing newborn morbidity and mortality.

Materials & Methods

This cross-sectional, hospital-based observational study was conducted at the Department of Obstetrics and Gynecology in Dhaka National Medical College Hospital, Dhaka, over a period of six months, from September 2019 to February 2020. The sample size was calculated using a specific formula to ensure the accurate measurement of a predetermined proportion at a particular level of statistical significance, resulting in a sample size of 58 participants.

The study population for this research comprised women with isolated oligohydramnios at term, regardless of their parity, who were admitted to the labor and antenatal wards during the six-month study period at Dhaka National Medical College Hospital. Inclusion criteria involved all primiparous and multiparous patients with oligohydramnios, confirmed both clinically and sonographically, and who were at term (≥37 gestational weeks). Exclusion criteria excluded patients with other medical disorders during pregnancy such as heart disease, hypertensive disorders, diabetes, renal disease, etc., as well as those who declined to participate in the study. Purposive sampling was employed as the sampling technique. The study's outcome variables encompassed various factors including sociodemographic variables (age, occupation, socioeconomic status), parity, gravidity, gestational age, past obstetric and medical history (including abortion, preterm delivery, previous oligohydramnios, and hypertension), amniotic fluid index (AFI), appearance of amniotic fluid, mode of delivery, and neonatal outcomes such as maturity, birth weight, APGAR scores, and neonatal complications.

After the research protocol was approved by the committee, permission for the study was taken from the Department of Institutional Review Board (I.R.B). In accordance with the Helsinki Declaration for Medical Research Involving Human Subjects 1964, the study participants were verbally informed of the study's design, objectives, and their right to withdraw from the project at any time and for any reason. Everything was explained to the patients in detail easily understandable language. Subjects who were give informed consent to participate in the study was included as study sample.

Results

Table-I: Distribution of patients according to their age (n=58)

Age(years)	No of patients	Percentage (%)
18-20	7	12.1
21-25	37	63.8
26-30	12	20.7
31-35	2	3.4
Total	58	100.0

Table-I showed that 12.1% were in age group less than 20 years, 63.8% were 21 to 25 years, 20.7% were in age group 26 to 30 years. The mean age of the study respondents was 23.84±3.47 years.

Table-II: Distribution of study subjects according to parity (n=58)

Parity	Number of patients	Percentage (%)
Nulliparous	20	34.5
Multiparous	38	65.5
Total	58	100.0

Table-II showed that among 58 patient's nulliparous patients were 34.5% & multiparous patient were 65.5%.

Table-III: Distribution of Study subjects according to their Gestation age at the time of delivery (n=58)

Gestational age (weeks)	Number of patients	Percentage (%)
37 to 40 completed weeks	41	70.7
41 to 42 completed weeks	17	29.3
Total	58	100.0
Mean±SD	38.5±2.1 weeks	

Table-III showed that among 58 patient 29.3% were post term deliveries (41 to 42 completed weeks); 70.7% patients were delivered by 37 to 40 completed weeks.

Table-IV: Amniotic fluid index (AFI) of the patients (n=58)

AFI	Number of patients	Percentage (%)
5.1-8cm (Borderline oligohydramnios)	42	72.4
< 5 cm (Severe oligohydramnios)	16	27.6
Mean±SD	5.88±1.43	

Table-IV showed that among 58 patients borderline oligohydramios was 72.4% and severe oligohydramnios was 27.6%.

Table-V: Color of liquor at the time of rupture of membranes (n=58)

Colour of Liquor	Number of patients	Percentage (%)
Normal in colour	42	72.4
Meconium-stained liquor	16	27.6
Total	58	100.0

Table-V showed that 6 among 58 patients meconium stained liquor was found only in 27.6% and normal liquor colour 72.4%.

Table-VI: Distribution of study subject according to mode of delivery (n=58)

Mode of delivery	Number of patients	Percentage (%)
Normal Vaginal delivery	12	20.7
Assisted Vaginal delivery	2	3.4
Caesarean section	44	75.9
Total	58	100.0

Table-VI showed 20.7% were normal vaginal delivery, 3.4% were assisted vaginal delivery and 75.9% were caesarean section.

Table-VII: Indications of caesarean section (n=44)

Indication	Number of patients	Percentage (%)
Foetal distress	24	54.5
Failed induction	12	27.3
Mal presentation	8	18.2
Total	44	100.0

Table-VII showed that the indication of caesarean section maximum 55.5% was due to fetal distress, 27.3% due to failed induction, and 18.2% were due to presentation.

Table-VIII: Mode of delivery in borderline &severe oligohydramnios (n=58)

Oligohydramnios	Caesarea Section	NVD	X^2	P-value
Borderline oligohydramnios (n=42)	28(66.7%)	14(33.3%)	7.03	0.008
Severe oligohydramnios (n=16)	16(100.0%)	0(0.0%)		

Table-VIII showed that in severe oligohydramnios group caesarean section was significantly higher than borderline oligohydramnios group. The difference was statistically significant (p=0.008).

Table-IX: Birth weight of the baby (n=58)

Birth weight	Number of patients	Percentage (%)
1.5 to 2.5kg	35	60.3
> 2.5 kg	23	39.7
Mean±SD	2.39±0.61	

Table-IX showed that among 58 babies Low birth weight baby was 60.3% and more than 2.5 kg were 39.7%.

Table-X: Distribution of the study subjects according to APGAR score of the baby at 1st minute and 5th minute

APGAR Score	At 1st minute		At 5th minute	
	No of patients	Percentage (%)	No of patients	Percentage (%)
0 to 4	6	10.3	6	10.3
5 to 6	29	50.0	20	34.5
>7	23	39.7	32	55.2

Table-X showed that APGAR score > 7 at 1stminute was found in39.7% babies, at 5th minute was found in 55.2% babies. APGAP score 5 to 6 at 1st minute was found in 50% babies, at 5th minute was found in 34.5% babies. APGAR score 0 to 4 at 1st minute was found in 10.3% babies, at 5th minute was found in 10.3% babies.

Table-XI: Comparison of AFGAR score less than 7 in borderline & severe oligohydramnios group at 5th minute.

APGAR Score	In borderline Oligohydramnios group (n=42)	In severe Oligohydramnios group (n=16)	X^2	p-value
<7	13(28.6%)	13 (81.3%)	13.11	<0.001
≥7	30(71.4%)	3 (18.7%)		

Table-XI showed that APGAR score <7 was significantly higher in severe oligohydramnios group (X2=13.11, P<0.001) than borderline oligohydramnios group, which is statistically significant.

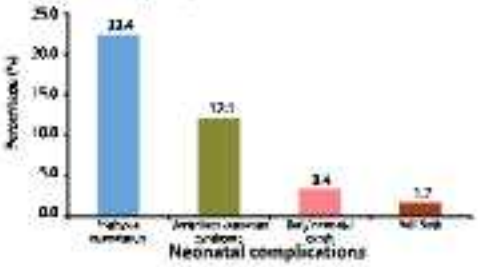

Figure-I: Bar diagram showing the neonatal complications.

Figure-I showed that out of 58 deliveries 23(39.7%) babies had suffered from neonatal complications. Among them 13(22.4%) suffered from birth asphyxia, 7(12.1%) from meconium aspiration syndrome. Early neonatal death was 2(3.4%) and still birth was 1(1.7%) mainly due to severe birth asphyxia. Alive take home newborn were 55(94.8%)

Table-XII: Admission in neonatal ward

Number of alive babies	Babies admitted in NICU		Admission not needed in NICU	
	No of patients	Percentage (%)	No of patients	Percentage (%)
55	23	41.8	32	58.2

Table-XII showed that among 55 alive babies, 41.8% babies were admitted in neonatal ward.

Discussion

The mean age of the patients in this study was 23.84±3.47 years, with a maximum of 63.8% aged between 21 and 25 years. Birandar & Shamanewadiet al.[19] showed that the mean age of pregnant women with oligohydramnios was 22.4±3.5 years, with the majority (64%) falling within the age group of 21-25 years. Comparable data were documented by other researchers, indicating that the mean age of women with oligohydramnios was 23.98±3.89 years, with 80.49% falling within the 20-29 age group.[20-22] According to our country's statistics, the majority of patients become pregnant in this age range.

This study's elevated incidence of oligohydramnios in multiparous women was likely attributable to the limited sample size, with a majority of patients being multiparous. In the study of 58 patients, only 16 (27.6%) exhibited meconium-stained amniotic fluid. Cosey's[23] study of 147 patients with oligohydramnios revealed meconium-stained amniotic fluid in only 9 individuals, representing a mere 6%. He asserted that meconium-stained amniotic fluid infrequently complicated the pregnancy with oligohydramnios. This study demonstrated no significant correlation between meconium-stained amniotic fluid and oligohydramnios. Meconium-stained liquid, however, was discovered to be substantially higher in the severe oligohydramnios group than in the borderline oligohydramnios group (In the borderline oligohydramnios 8/36 and in the severe

oligohydramnios 6/14, p>0.05). Nath et al.[24] showed no significant difference in meconium-stained amniotic fluid between the borderline and severe oligohydramnios groups. This study shown that an increased severity of oligohydramnios correlates with a higher incidence of liquor staining and an elevated risk of meconium aspiration syndrome (12.1% in our study compared to 5% in Cosey's study[23]).

In this study, the caesarean section rate was 44 (75.9%), with 54.5% of the indications attributed to foetal distress. Chudalet al.[5] observed an increased rate of caesarean section deliveries attributable to fetal distress. Magannet al.[25] discovered that the incidence of caesarean section birth was 15.2% among 341 individuals with oligohydramnios. Voxmanet al.[15] also identified an increased rate of cesarean sections (14.7%) due to fetal distress in the oligohydramnios cohort. Magannet al.[25] and Voxman[8] demonstrated in their research that the caesarean section rate was elevated among patients with oligohydramnios, albeit not considerably higher than observed in this study. This is likely attributable to inadequate fetal monitoring throughout the antepartum and intrapartum periods. To avert negative impacts on neonatal outcomes, a caesarean section was performed in most instances. Voxman's study indicated that the caesarean section rate was elevated in the severe oligohydramnios group compared to the borderline oligohydramnios group (9.7% vs 5%, p<0.05).[8] The study indicated that the incidence of caesarean section delivery was markedly greater in the severe oligohydramnios group compared to the borderline oligohydramnios group.

Manning et al.[16] conducted a study including 120 individuals referred for suspected intrauterine growth restriction (IUGR) and discovered that 91 had normal amniotic fluid content, of which 86 (94.5%) delivered healthy infants. Conversely, amniotic fluid content has diminished in 29 individuals, of whom 20 (89.9%) delivered infants with intrauterine growth restriction (IUGR). Moreover, neonatal morbidity has escalated tenfold in patients with decreased amniotic fluid volume. Rathurford et al. have proposed that an amniotic fluid index of 5 cm or less, aligning with prevalent sonographic criteria for oligohydramnios, serves as a criterion for the delivery of a fetus at or near term.[10]

Senvo et al.[17] observed a markedly elevated risk of cesarean section due to fetal distress and a low APGAR score in patients with an amniotic fluid index below 5 cm. This study found that 60.3% of babies were born weighing less than 2.5 kg. A study conducted by Magannet al.[25] revealed that among 79 patients with oligohydramnios, the preportion of low birth weight infants was 10%. Coseyet al.[23] noted that out of 147 individuals with oligohydramnios, 41 (35%) delivered low birth weight infants. Oligohydramnios may indicate inadequate intrauterine nourishment for the fetus.

This study found that the APGAR score at 5 minutes was considerably lower than 7 in the severe oligohydramnios group (p<0.001). Other researchers made nearly identical observations.[26]

In this study, neonatal complications were observed in 23 out of 58 babies. Birth asphyxia occurred in 22.4% of cases, while meconium aspiration syndrome was present in 12.1% of cases. In the study by Coseyset al.[23] respiratory distress syndrome occurred in 10% of cases, while meconium aspiration syndrome was seen in 1.4% of cases.

The analysis indicated one stillbirth (1.7%) and two early neonatal deaths (3.4%). The infants had a birth weight exceeding 2.5 kg, the amniotic fluid was stained with meconium, and there was a real knot in the umbilical cord around the neck.

In this study, admission to the neonatal care unit was reported to be 23 (41.8%). Neonatal admissions in two further investigations were 10% and 7%, respectively.[24-27]

The current investigation revealed that 35 (60.3%) of the babies exhibited low birth weight. Twenty-three (39.7%) infants experienced neonatal problems. Of these, 22.4% experienced birth asphyxia, while 12.1% were affected by meconium aspiration syndrome. Early newborn mortality was 3.4%, and stillbirth occurred at a rate of 1.7%, primarily attributed to severe birth asphyxia. The incidence of an APGAR score below 7 was markedly greater in the severe oligohydramnios group compared to the borderline oligohydramnios group, which is statistically significant. 41.8% of infants were admitted to the neonatal intensive care unit. In a study conducted by Sowmya K et al.[28], low birth weight was observed in 48%, an APGAR score of less than 7 was noted in 14%, and 14% were admitted to the NICU. A study conducted by Madhavi K et al reported a 36% incidence of meconium-stained amniotic fluid, with 20% of neonates exhibiting an APGAR score below 7 at 5 minutes, a 34% rate of NICU admissions, and a 6% incidence of meconium aspiration syndrome (MAS).[29]

Oligohydramnios is acknowledged as a clinical indicator of impending severe neonatal distress. . We identified 3 prenatal deaths (1 stillbirth and 2 early neonatal deaths), constituting 5.2%, while Casey et al. [23] reported a rate of 6.4% perinatal deaths. Ja and Young et al.30 concluded in their study that in the borderline AFI group, aberrant dorsal velocimetry measurements were associated with worse perinatal outcomes, necessitating enhanced antenatal surveillance. In conclusion, an adverse perinatal outcome was observed in the severe oligohydramnios group. The incidence of an APGAR score below 7 was markedly greater in the severe oligohydramnios group compared to the borderline oligohydramnios group, a finding that is statistically significant.

Conclusion

It has been determined that the rate of Caesarean section deliveries was significantly high at 75.9%. Secondly, foetal distress was the primary indication for Caesarean section, which accounted for 54.5% of cases. Additionally, a substantial proportion of neonates with APGAR scores below 7 at the fifth minute were notably associated with severe oligohydramnios, at 81.3%. Furthermore, a significant number of mothers with oligohydramnios delivered low-birth-weight infants, with a prevalence of 60.3%. Finally, it was noted that a significant number of neonates, 41.8%, necessitated admission to the neonatal ward. These results emphasize the significance of early detection and appropriate management of oligohydramnios in order to enhance perinatal outcomes and decrease the chance of adverse events during childbirth.

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ORIGINAL ARTICLE

Functional outcome of open reduction and internal fixation by volar locking plate for the treatment of volar Barton fractures of distal radius in active adult patients.

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Abstract:

Background: Volar Barton fractures represent a specific type of intra-articular fracture, resulting from shear pressures that lead to the displacement of the volar lips of the distal radius. Volar Barton fractures are uncommon and exhibit significant instability. This type of fracture is almost always associated with volar subluxation of the radiocarpal joint. The results of conservative treatment for volar Barton fractures are often disappointing and associated with various complications. Volar Barton fractures of the distal radius generally require surgical fixation to achieve the best possible outcomes.

Objectives: To assess the functional results of volar Barton fractures in active adults who have undergone open reduction and internal fixation with a volar locking plate.

Methods: This prospective study was conducted at various private hospitals in Dhaka and Narayanganj from January 2019 to December 2022. We analyzed the outcomes of twenty-two cases of volar Barton fractures, which were managed through open reduction and internal fixation utilizing a volar locking plate. The patients were assessed at regular intervals, with the final follow-up occurring one year later for each individual.

Results: This study comprised the open reduction and internal fixation utilizing a volar locking plate in a group of 22 individuals diagnosed with volar Barton fractures. Throughout the course of one year, all patients underwent monitoring to evaluate the outcomes of their treatment. Every fracture has been successfully fixed. The average time for fracture union was found to be 8.5±2.5 weeks. By the end of the follow-up period, every patient successfully attained the necessary and satisfactory range of motion. Based on the Modified Mayo Wrist Score, a remarkable 54.55% of patients achieved excellent functional outcomes, while 40.91% exhibited good outcomes. It is recommended that open reduction and internal fixation with a volar locking plate serves as a highly effective treatment approach for volar Barton fractures in active adults.

Conclusions: Open reduction and internal fixation with a volar locking plate is a trustworthy treatment option with promising results for volar Barton fractures of the distal radius in active adult patients.

Keywords: Volar Barton fractures, Volar locking plate. Open reduction, Internal fixation, Distal radius.

Introduction

Volar Barton fractures are intra-articular fractures resulting from shear forces with displacement of volar lips of the distal radius. Volar Barton fractures are uncommon and extremely unstable.[1] This type of fracture is almost always associated with volar subluxation of the radiocarpal joint. The outcome of conservative management for volar Barton fractures is not satisfactory and is associated with complications like subluxation, instability, deformity and early

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osteoarthritis. Therefore, most cases are treated with open reduction and internal fixation (ORIF) to restore articular congruity and function. Open reduction and internal fixation (ORIF) using volar locking plate is one of various management options. In this study, we present our experience regarding the functional outcomes of open reduction and internal fixation by volar locking plate for the treatment of volar Barton fractures in active adult patients

Materials & Methods

This prospective study was conducted at various private hospitals in Dhaka and Narayanganj from January 2019 to December 2022. We analyzed the outcomes of twenty-two cases of volar Barton fractures, which were managed through open reduction and internal fixation utilizing a volar locking plate. The patients were assessed at regular intervals, with the final follow-up occurring one year later for each individual. A functional evaluation was carried out with the Modified Mayo Wrist Score.[2] The union was assessed using plain radiography.

Inclusion Criteria

- Patients with age >18 years and <60 years
- Fresh injuries, not more than 2 weeks old
- Closed fractures
- Ability to provide informed consent
- Ability to comply with follow-up

Exclusion Criteria

- Age: <18year and >60years
- Polytrauma
- Open fracture
- Pathological fracture
- Fracture >2 weeks old
- Associated wrist injuries
- Neurovascular disorder
- Head injury at time of trauma
- Medical contraindications to general anesthesia

Results

The age of the patients at the time of injury varied between 18 to 60 years with average of 30.6 years. Among 22 patients, sixteen (72.73%) were male and six cases (27.27%) were female. Twelve fractures (54.55%) involved the right side (on the dominant side) and ten (45.45%) involved the left side (on the non-dominant side).

Causes of injury:

In this study, nineteen patients (86.36%) developed fractures as a result of high energy trauma (road traffic accident). Other cause was fall in three patients (13.64%).

Range of Motion:

Mean flexion of 70.23°±3.60°, extension of 72.22°±3.91°, ulnar deviation of 27.98°±2.74°, radial deviation of 9.25°±2.10°, pronation of 73.30°±2.51° and supination of 78.11°±3.12° were recorded at the injured wrist at final follow up.

Table-I: Movements of the injured wrist at final follow up

Movement	Mean
Flexion	70.23°±3.60°
Extension	72.22°±3.91°
ulnar deviation	27.98°± 2.74°
radial deviation	9.25°±2.10°
Pronation	73.30°±2.51°
Supination	78.11°±3.12°

Union:

Average duration of fracture union was 8.5±2.5 weeks.

Functional outcome (according to Modified Mayo Wrist Score):

12 patients (54.55%) were rated as "Excellent", 09 patients (40.91%) as "Good" and 01 patients (4.54%) as "Fair".

Functional Score	Number of patients	Percentage (%)
Excellent	12	54.55%
Good	09	40.91%
Fair	01	4.54%

Complications:

In this study, two patients (9.09%) experienced superficial wound infections necessitating surgical dressing and antibiotic treatment. Early signs of Complex Regional Pain Syndrome (CRPS) were noted in a single patient. The issue was treated with physiotherapy and anti-inflammatory medications. Symptomatic screw misplacement occurred in one patient (4.54%). There was no evidence of median nerve involvement.

Discussion

A Volar Barton's fracture, attributed to the American surgeon John Rhea Barton[3], is characterized by a fracture of the distal radius that impacts the volar rim and extends into the intra-articular region. Volar Barton fractures represent rare injuries often associated with high-velocity trauma. Various treatment options are available to address these fractures. The techniques include closed reduction with plaster application, percutaneous pinning, external fixation, open reduction with internal fixation using Kirschner wires, and open reduction with internal fixation featuring a volar plate. Closed reduction is generally a simple procedure, yet maintaining its effectiveness proves to be difficult. The outcomes of conservative treatment frequently fall short, leading to complications like early osteoarthrosis, deformity, subluxation, and instability.

The present study aims to evaluate the results of volar Barton fractures in adults treated with a volar locking plate. The site of the fracture was accessed via the distal segment of the volar technique as described by Henry.[4] The final assessment utilized the Modified Mayo Wrist Score. The Modified Mayo Wrist Score emphasizes the importance of a partnership between the patient and physician in evaluating pain levels, comparing the active flexion and extension range to the opposite side, assessing grip strength in relation to the opposite side, and determining the capacity to resume normal work or activities. Scores are classified into distinct categories: excellent (91-100), good (80-90), fair (65-79), and poor (<65).

This study comprised 25 individuals with volar Barton fractures, with a mean age of 30.6 years. 72.73% of the patients were male, while 27.27% were female. The injury mechanism was high-energy trauma, occurring in 86.36% of patients due to road traffic accidents, whereas the remaining 13.64% resulted from falls. Ansari AR et al.[5] revealed that the mechanism of injury was a roadside crash in 15 out of 20 cases (75%).

At the final follow-up, the motion of the injured wrist was recorded as follows: 70.23 ± 3.60° of flexion, 72.22 ± 3.91° of extension, 27.98 ± 2.74° of ulnar deviation, 9.25 ± 2.10° of radial deviation, 73.30° ± 2.51° of pronation, and 78.11° ± 3.12° of supination. Raina and colleagues reported similar findings in their study.[6] In the concluding follow-up, the author recorded a mean flexion of 67.47°±4.8°, a mean extension of 71.52°±3.98°, a mean radial deviation of 8.45°±2.6°, a mean ulnar deviation of 27.56°±2.9°, a mean pronation of 72.65°±2.3°, and a mean supination of 76.35°±3.67°. Khatri K et al.[7] detailed in their study that the measurements were 71.91 ± 8.08° for flexion, 76.95 ± 5.70° for extension, 77.65° ± 6.01° for pronation, and 81.86° ± 6.28° for supination. The observations presented here draw parallels to the study carried out by Karthik SJ et al.[8]

All fractures in this series healed within 11 weeks post-surgery, with a range of 6 to 11 weeks and a mean of 8.5 weeks. Aggarwal AK et al.[9] stated in their study that all fractures healed within 7.0 to 10.0 weeks (mean, 8.8 weeks).

The ultimate functional outcome at one year was assessed utilizing the modified Mayo wrist score. In 54.55% of the patients, calculated scores were classified as "Excellent," while in 40.91%, they were classified as "Good." These data are analogous to the study conducted by Kolla A et al.[10] In their study, 55% of patients attained outstanding outcomes, while 35% received good outcomes.

The primary issue identified in this study was superficial wound infection, which was addressed through standard dressing procedures and the use of antibiotics tailored to specific cultures. One patient exhibited initial symptoms of CRPS. The condition was effectively managed with physiotherapy and analgesic anti-inflammatory medication. One patient exhibited symptomatic screw misplacement. No instances of median nerve compression or any significant complications were seen. Elerian S et al.[11] found problems in 11 out of 61 individuals (18%). The complications consisted of superficial infections of the wound, carpal tunnel syndrome, superficial nerve injury, tenosynovitis, and symptomatic screw misplacement.

There are certain flaws in the current study. The control group is absent, and the study is conducted with limited sample size. It is imperative that extensive randomized controlled trials be conducted on the subject.

Conclusion

To attain a favorable functional outcome, volar Barton fractures of the distal radius necessitate surgical fixation, which can be accomplished through several fixation techniques. This study demonstrates that open reduction and internal fixation with a volar locking plate yields excellent to good functional outcomes in 95.46% of patients. In conclusion, open reduction and internal fixation with a volar locking plate is a trustworthy treatment option with promising results for volar Barton fractures of the distal radius in active adult patients.

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ORIGINAL ARTICLE

Ethanolic extract of green tea (Camellia sinensis) improve lipid profile specially low density lipoprotein in experimentally induced hypercholesterolaemic rats.

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Abstract:

Background: The ethanolic extract of green tea is believed to significantly reduce lipid levels in rats with experimentally induced hypercholesterolemia.

Objectives: To determine the lipid-lowering efficacy of green tea in rats with experimentally induced hyperlipidemia.

Materials and Methods: An experimental study was done to determine the hypocholesterolaemic impact of green tea (Camellia sinensis) on rats with induced hypercholesterolaemia. The study was carried out from July 2015 to June 2016 in the Department of Pharmacology & Therapeutics at Dhaka Medical College, Dhaka. This study comprised 42 healthy rats of the Norwegian strain, divided into 6 groups. Atorvastatin served as the reference medication for comparison. Rats were administered a fatty meal consisting of 1.5 cc of olive oil and 1% cholesterol to induce hypercholesterolemia. The experimental group was administered ethanolic extract of green tea at dosages of 100 mg/kg and 200 mg/kg. Each group was treated for ten days and subsequently sacrificed on the eleventh day. The serum low-density lipoprotein (LDL) level was assessed with lipid profile kits.

Result: The serum LDL levels in the groups of rats administered 100 mg/kg and 200 mg/kg of ethanolic extract of green tea, together with a 1% cholesterol diet, were lower than those in the hypercholesterolemic control group. The decrease in LDL levels was comparable to that observed in hypercholesterolemic rats administered 0.14 mg/kg atorvastatin for 10 days. The mean serum LDL levels, along with their standard deviations, for groups C, D, E, and F were recorded as 82.81 ± 2.28, 60.68 ± 3.28, 32.6 ± 3.12, and 30.88 ± 3.93 mg/dl, respectively. All groups exhibited a reduction in serum LDL levels when compared to the hyperlipidemic control group (group C). However, changes were markedly significant in groups E and F ($p<0.001$, $p<0.001$) (Table V, Fig. 5.5).

Conclusion: Green tea (camelia sinesis) exhibits significantly hypolipidemic effect. Several double blinded randomized controlled clinical trial should be done after careful toxicology study. Then it could be act as a potent hypolipidaemic agent for therapeutic use.

Keywords: Ethanolic extract, Green tea (camellia Sinensis), Hypercholesterolaemia, Cholesterol, Rats

Introduction

Hypercholesterolemia represents a medical condition marked by elevated cholesterol levels within the bloodstream. Individuals diagnosed with hypercholesterolemia face an elevated risk of encountering a specific type of heart disease known as coronary artery disease.[1]

A wealth of research suggests that reducing serum cholesterol levels can play a crucial role in preventing, managing, and potentially reversing atherosclerosis and coronary heart disease. Desirable health outcomes, such as low triglycerol and low-density lipoprotein

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(LDL-C) levels or elevated high-density lipoprotein cholesterol (HDL-C) levels, have been observed as a result of utilizing certain plant materials.[2]

In the scientific community, green tea is referred to as Camellia Sinensis. However, the tea leaves used in the production of green tea are not fermented; rather, they are dried or mildly steamed.[3]

Another study conducted by Vanessa C et al., 2004 revealed that the consumption of green tea leads to a reduction in LDL cholesterol levels. Simultaneously, HDL cholesterol rises, indicating that green tea polyphenols have an antiatherosclerotic impact. The sustained consumption of tea catechins may play a significant role in mitigating obesity caused by high-fat diets through the modulation of lipid metabolism.

This study demonstrates a notable decrease in LDL levels following the administration of ethanolic extract of green tea in rats with experimentally induced hyperlipidemia. Atorvastatin, a widely prescribed medication for lowering lipid levels, serves as a reference drug for comparison. A further investigation conducted by Farjad. A, et al., in 2012 revealed the impact of ethanolic extract of green tea on reducing lipid profile levels in rats.

This study's findings demonstrated that green tea extract has a significant effect on lowering hyperlipidemia.[5]

Materials & Methods

1. Animals:

An experimental study took place in the pharmacology department at Dhaka Medical College, Dhaka, spanning from July 2015 to June 2016. A total of 42 Norwegian rats, encompassing both sexes and weighing between 150-200g, aged 8-10 weeks, were gathered for the study. The subjects were housed in the animal facility of the Department of Pharmacology at Dhaka Medical College. Rats from various batches and groups were housed in distinct metallic cages within a well-ventilated room, where they were permitted to consume a standard laboratory diet and access water. The rats underwent a 10-day acclimatization period at specified temperature and humidity levels.

2. Drugs and chemicals:

a) The green tea (Camellia Sinensis) was procured from the local market. The plant received official authentication from the National Herbarium in Dhaka. Extract developed in the pharmaceutical research laboratory of the Center for Advanced Research in Science (CARS). A mixture of powdered green tea and 1000 milliliters of ethanol with a concentration of 95% was shaking continuously for a period of 48 hours in order to prepare the extract. Following the filtration process, the suspension underwent evaporation using a rotary evaporator, achieving an extractive value of 95%. The extract was kept in a refrigerator at 4°C until required.

a) Distilled water

b) Standard laboratory diet

Fatty mixer: A blend of 1.5ml olive oil combined with 1% cholesterol. Ten grams of cholesterol were dissolved in one hundred milliliters of olive oil. Administer 1.5ml of olive oil for each rat, considering an average weight of 150g.

a) contained 0.15g of cholesterol, which corresponds to a diet comprising 1% cholesterol.

b) Atorvastatin: This was utilized as a standard hypolipidemic agent and was sourced from the laboratory of Beximco Pharmaceuticals.

c) lipid profile kits (plasma tec laboratories)

Procedure

Rats were subjected to a high-fat diet consisting of 1.5ml of olive oil combined with 1% cholesterol to induce hypercholesterolemia. In this study, green tea was administered at doses of 100mg/kg and 200mg/kg, alongside atorvastatin at 0.14mg/kg, to evaluate their hypocholesterolemic effects in hyperlipidemic rats. A total of 42 rats were utilized for the study, randomly assigned to 6 distinct groups. The experiments are categorized into two distinct sections.

Experiment– I

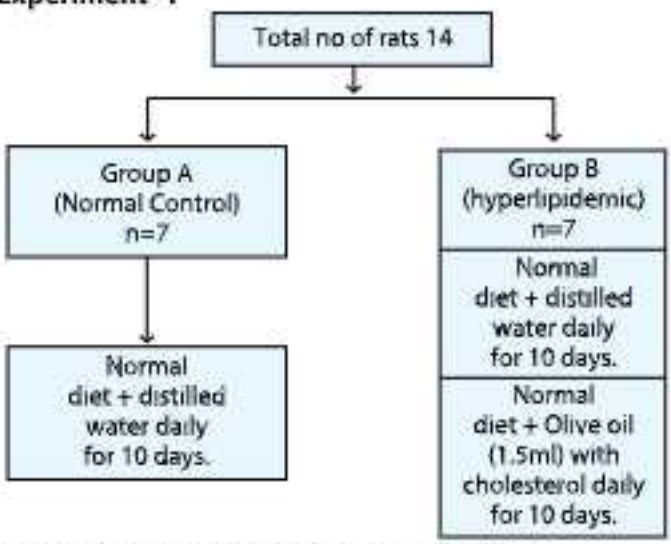

Fig-I: Experimental Design of experiment I

Experiment– II

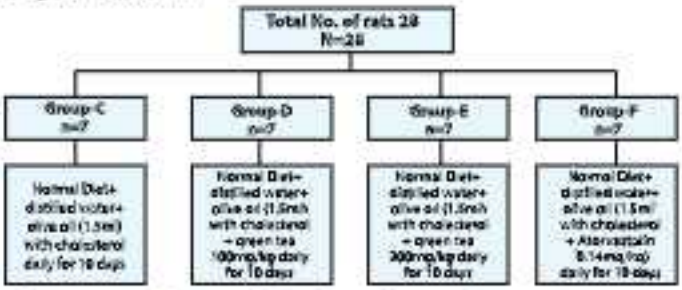

Fig-II: Experimental Design of experiment II

Rats were euthanized while under light anesthesia with chloroform. Blood samples, measuring around 2-3 ml, were meticulously collected from each rat via cardiac puncture. Each sample was carefully placed in distinct, clean, and dry test tubes, with appropriate identification numbers clearly marked.

QRS duration (ms)	NO (LVEF ≥52%)
Group A	28.28±4.22
Group B	85.42±3.38***

Following centrifugation at 4000 rpm for 5 minutes, the separated serum was meticulously collected with a micropipette and transferred into individually labeled containers, subsequently stored at -15°C for future biochemical analysis. Every relevant detail for each rat was diligently documented in a thoughtfully designed data collection sheet. The gathered data was meticulously screened and compiled, subsequently undergoing appropriate statistical analyses, including the unpaired Student's 't' test, with the aid of computer-based software.

Experiment-I

The average LDL levels in groups A and B were 28.28 ± 4.22 mg/dl and 85.42 ± 3.38 mg/dl, respectively. The elevation in the average blood LDL level in group B relative to group A was statistically significant ($p<0.001$). (Table I)

Table-I: Effect of HCD on Serum lipid level of adult rats

Experiment II

The mean ± SD of serum LDL levels in groups C, D, E, and F were 82.81 ± 2.28, 60.68 ± 3.28, 32.6 ± 3.12, and 30.88 ± 3.93 mg/dl, respectively. The blood LDL levels were reported to decrease in all groups compared to the hyperlipidemic control group (group C). However, alterations were markedly significant in groups E and F ($p<0.001$, $p<0.001$).

Data expressed as mean± SD

$P<0.05$ is considered significant; $P<0.001$ is regarded as highly significant.

Group C: administered a standard meal, distilled water, and olive oil (1.5 ml) alongside cholesterol.

Group D: administered a standard diet, distilled water, olive oil (1.5 ml) containing cholesterol, and green tea (100 g/kg/day).

Group E: administered a standard diet, distilled water, olive oil (1.5 cc), cholesterol, and green tea (200 g/kg/day).

Group F: administered a standard diet, distilled water, olive oil (1.5 ml), cholesterol, and atorvastatin (0.14 mg/kg).

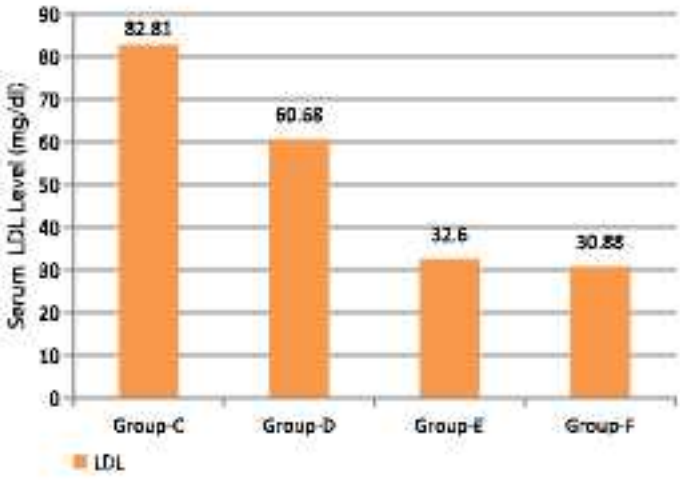

Figure-II : Bar diagram showing serum low-density lipoprotein levels in different groups of rats in Experiment-II

Discussion

This study aimed to assess the impact of varying dosages of green tea on serum LDL levels in a rat model of experimentally induced hypercholesterolemia. Hyperlipidemia was generated in rats with the administration of 1.5 ml of olive oil containing 1% cholesterol over a period of 10 days. Hyperlipidemia was indicated by a substantial elevation ($p<0.001$) in serum total cholesterol levels.

A comparable observation was noted by Rokshana Dil, who administered a normal diet, distilled water, olive oil, and 1% cholesterol over a period of 28 days. Cholesterol levels in serum were elevated in rats. The findings of their research are mostly consistent with those of the current study.[8]

Aftabuddin et al. (2014) conducted similar research involving rats that were fed cholesterol. This study

aims to explore how green tea influences serum lipid levels. The administration of green tea alongside a cholesterol diet has demonstrated a noteworthy reduction in total cholesterol (TCL), LDL, and triglyceride (TG) levels ($p<0.001$).[7]

In Experiment II, the impact of green tea on serum LDL levels was assessed in hyperlipidaemic Norwegian subjects (n=28) weighing between 150 and 200 grams. The serum LDL level significantly decreased ($p<0.001$) in all groups treated with green tea and atorvastatin compared to the hyperlipidemic control group.

Similar trials were conducted using cholesterol-fed rats. The objective of the study is to examine the impact of green tea on serum LDL levels. The administration of green tea in conjunction with a cholesterol diet resulted in a considerable reduction of total LDL levels ($p<0.001$).

Nonetheless, the lipid-lowering impact of green tea in the current investigation has been determined to be dose-dependent. The reduction of LDL levels at a greater dosage of green tea (200 mg/kg) was significantly more pronounced than at a lower dosage (100 mg/kg).

Fatemeh Haidari et al. (2012) also noted alterations in lipid parameters in a dose-dependent manner.

Our findings are similar with several other research conducted on experimental animals.[8,9] Other human studies demonstrate conclusions analogous to those of our experimental research.[10,11]

Conclusion

The green tea (Camellia sinensis) demonstrates a significant hypolipidemic impact. Prior to recognizing Green tea (Camellia sinensis) as a therapeutically effective hypolipidaemic medication, additional research must be conducted to identify the active constituents responsible for the hypolipidaemic effect and understand its cellular mechanism of action. Multiple double-blind randomized controlled clinical studies should be conducted following a thorough toxicological assessment. Green tea (Camellia sinensis) may serve as an effective hypolipidaemic drug for therapeutic purposes.

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ORIGINAL ARTICLE

A comparative study on the efficacy of antiemetic drugs to prevent per-operative nausea and vomiting among parturients undergoing caesarean section under spinal anesthesia

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Abstract:

Background: Nausea and vomiting are undesirable per-operative events among parturients during cesarean section under spinal anesthesia. Therefore prophylaxis is recommended.

Objectives: To compare & assess the effect of intravenous Ondansetron, Metoclopramide and Prochlorperazine Maleate administered before achieving spinal anesthesia for preventing per-operative nausea and vomiting.

Materials and methods: This comparative study was done in the Department of Anesthesiology in Dhaka National Medical Institute Hospital, Dhaka from February 2024 to January 2025. Total 60 women, age ranged from 18-45 years undergoing caesarean section of both emergency and elective were included. They were divided into 3 groups as group A, B, C; each group comprising with 20 subjects. Group-A received intravenous metoclopramide, group-B received intravenous prochlorperazine maleate & group-C received intravenous ondansertron.

Results: Among 20 patients of Group A, mean age was 26.53±5.9 years, height was 151.27±3.8cm and weight was 63.77±9.5kg; while in group B, mean age was 27.00±6.2 years, height was 152.10±4.7cm and weight was 62.97±9.1kg and for group C, mean age was 28.71±7.72 years, height was 153.24±5.2 cm and weight was 64.78±9.6kg. In group A (Metoclopramide), 6 patients (30.0%) had IONV and in group B (Prochlorperazine), 3 patients (15.0%) and in group C (Ondansetron), 1patient (5.0%) had IONV respectively. Regarding hypotension with IONV 5 patients (55.5%) in group A, 2 patients (25.0%) in group B and 1 patient (10.0%) in group C respectively. But statistically the difference was not significant.

Conclusions: This study reveals that intravenous Ondansetron had superior effect in preventing nausea and vomiting among parturients undergoing caesarean section under spinal anesthesia in contrast to intravenous Metoclopramide and Prochlorperazine Maleate.

Keywords: Metoclopramide, Ondansetron, Nausea-vomiting, Caesarean Section, Spinal Anesthesia.

Introduction

Intraoperative nausea and vomiting (IONV) occur in 40 to 80% of women receiving spinal anesthesia for cesarean section.[1] Nausea and vomiting might complicate perioperative care due to the patient's increased risk of aspirating vomitus. Moreover, the protrusion of abdominal contents would disrupt the surgeon during the operation.[2] The primary objective of obstetric anesthesia is to guarantee the safety of both mother and infant. Consequently, it is imperative to meticulously choose the anesthesia and its delivery. Spinal anesthetic, due to its straightforward administration and minimal effects on the fetus, has emerged as the preferred option for cesarean sections.

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The APGAR score of the fetus under spinal anesthesia was superior than that under general anesthesia.[3] While spinal anesthesia is optimal for cesarean sections, it may also induce unpleasant responses. Spinal anesthesia may result in significant bradycardia or hypotension in parturients exhibiting unstable hemodynamics.[4] A variety of pharmacological agents have been utilized for the treatment and prevention of IONV: 5-hydroxytryptamine (5-HT3) antagonists (e.g., Ondansetron and Granisetron), dopamine receptor antagonists (e.g., Metoclopramide), butyrophenones (e.g., Droperidol), and anticholinergic agents (e.g., Atropine).[5] Specific essential limiting criteria are associated with them. This encompasses expenses associated with 5-HT3 antagonists and extrapyramidal symptoms (tremor, bradykinesia, dyskinesia) linked to dopamine receptor antagonists. Dopamine and histamine antagonists, such as prochlorperazine maleate, exhibit antiemetic properties and are utilized in our local community as prophylaxis against nausea and vomiting during spinal anesthesia. This study aims to evaluate the efficacy of Ondansetron, Metoclopramide, and Prochlorperazine Maleate administered prior to spinal anesthesia for the prophylaxis of IONV at our hospital.

Materials & Methods

This was a prospective observational study conducted in Dhaka National Medical Institute Hospital, Dhaka from February 2024 to January 2025. For this, a total of 60 patients, age ranged from 18-45 years who undergo caesarian section under spinal anesthesia in Dhaka National Medical Institute Hospital, Dhaka, were recruited in this study according to inclusion and exclusion criteria. They were divided into 3 groups such as, group-A (intravenous metoclopramide), group-B (intravenous prochlorperazine maleate) and Group-C (intravenous ondansetron). There were 20 different patients in each group.During Pre anesthetic assessment every patient under through physical examination with ASA (American Society of Anesthesiologists) classifications. Total anesthetic procedure was explained and informed consent was taken from the participants of this study. The study protocol was approved by the institutional Ethics committee of Dhaka National Medical Institute Hospital, Dhaka. The preliminary screening panel for each patient was included the complete history, physical examination and the necessary laboratory tests. The preliminary screening panel for each patient was included the complete history, physical examination and the necessary laboratory tests.

• Inclusion criteria:

1. ASA class I and II
2. Patients agreeto participate in this study signing an informed written consent.

• Exclusion criteria:

1. Gastrointestinal disorder
2. Motion sickness
3. Hyperemesis gravidarum
4. Intake of antiemetic drugs within the previous 24 hours or had local anesthetics
5. Patient with psychiatric disorder
6. Patient with preeclampsia,eclampsia
7. Patient with neuro logical disorder
8. ASA class III and IV
9. Coagulopathy

Sixty(60) patients, scheduled for caesarean section under spinal anesthesiawere included in this study. They were divided into 3 groups: Group-C (ondansetron), Group-A (metoclopramide) and group-B (prochlorperazine maleate). There were 20 patients in each group.

Intravenous access was established with 18G cannula. Premedication was done intravenous (IV) Omeprazole (40mg) followed by preloading with 15-20ml/kg Lactated Ringer's solution before anesthesia.In addition, patients wereput into the left lateral position and given 5L/minute oxygen by a fascial mask for avoiding the pressure on the aortocaval area. Patients in group C, received 8mg Ondansetron in 5ml intravenously (IV), group A received 10mg metoclopramide in 2ml intravenously (IV), group B received 12.5mg prochlorperazine in 2ml intravenously (IV), 20 minutes before establishing spinal anesthesia.

Under full aseptic precaution, spinal anesthesia was carried out in sitting position at lumbar 3-4 interspace using 25G Quincke's spinal needle.Finally, nausea and vomiting were evaluated using the Bellville scoring6, that is, the following values were assigned to the factors: No symptom=0, nausea=1, gagging=2, vomiting=3.

Patients were monitored for hypotension. Hypotension was defined as decrease in systolic or mean arterial

blood pressure of >20% from the baseline value. Hypotension was treated using crystalloid infusion and ephedrine administration at 6mg intravenous boluses. APGAR scores for the neonates in the 1st and 5th minutes were also recorded.

Statistical analysis

Data was compiled, presented and appropriate statistical test was done in this study for drawing an appropriate conclusion. Quantitative variable i.e. age, sex, height, weight, pulse, blood pressure. Qualitative variables, i.e.nausea, gagging, vomiting were presented as percentage. Anova test was applied for comparisons of quantitative variables in three groups. Chi-square test was applied for comparison of qualitative variables in three groups.

Observation and Results

Comparison of mean age, height and weight are presented in Table-I and there were no significant difference among three groups. Nausea occurred in 6 (30.0%) patients in group A,3 (15.0%) in group-B and 1 (5.0%) patient in group-C. Retching or gagging occurred in 4 (20.0%) and 3 (15.0%) of patients in group-A and B Prespectively. Retching was not documented in group-C. Vomiting occurred in 3(15.0%), 2 (10.0%)and none of patients in groups-A, B and O respectively [Table-II]. In group-A, 5 (55.5%) of the patients experienced hypotension with IONV while the figures for groups-B and C were 2 (25.0%) and 1 (10.0%) respectively [Table-III].

Table-I: Demographic Characteristics

Variable	Group-A	Group-B	Group-C
Age (years)	26.53±5.9	27.00±6.2	28.71±7.72
Height (cm)	151.27±3.8	152.10±4.7	153.24±5.2
Weight (kg)	63.77±9.5	62.97±9.1	64.78±9.6

Data expressed as mean (±SD) and analyzed Anova test.

Group-A: subjects received intravenous metoclopramide

Group-B: subjects received intravenous prochlorperazine maleate

Group-C: subjects received intravenous ondansetron.

Table-II: Incidence of per-operative nausea, gagging, vomiting among study groups

	Drug Study Group		
	Group-A n(%)	Group-A n(%)	Group-C n(%)
IONV (Summary)			
Yes	6(30.0)	3(15.0)	1(5.0)
No	14(70.0)	17(85.0)	19(95.0)
Retching (Gagging)			
Yes	4(20.0)	3(15.0)	0(0)
No	16(80.0)	17(85.0)	20(100.0)
Vomiting			
Yes	3(15.0)	2(10.0)	0(0)
No	17(85.0)	18(90.0)	20(100.0)
Nausea			
Yes	6(30.0)	3(15.0)	1(5.0)
No	14(70.0)	17(85.0)	19(95.0)

Data analyzed using Chi- square test.

n = Total number of subjects

Table-III: Hypotension and per-operative nausea and vomiting

IONV	Hypotension	
	Yes n(%)	No. n(%)
Group- A		
Yes	5(55.5)	1(9.0)
No	4(44.5)	10(91.0)
Group- B		
Yes	2(25.0)	1(8.3)
No	6(75.0)	11(91.7)
Group- C		
Yes	1(10.0)	0(0)
No	9(90.0)	10(100.0)

Data analyzed using Chi- square test.

Discussion

Metoclopramide is a strong prokinetic drug that blocks dopamine receptors and speeds up the emptying of the stomach. It is used to treat nausea and vomiting, as well as gastroesophageal reflux and gastric stasis.[7] The prevalent adverse effects include extrapyramidal syndrome, dizziness, headache, and supraventricular tachycardia, among others. Ondansetron is the prototype medication within the serotonin 5HT3 antagonist class, principally utilized for the management of nausea and vomiting by inhibiting the release of 5HT3 from activated platelets that engage 5HT3 receptors in the vagal nerve endings, while also diminishing the occurrence of hypotension.[8] The prevalent side effects include headache, tachycardia, moderate sedation, and constipation, among others. Prochlorperazine maleate is a D2 dopamine receptor antagonist that also inhibits histaminergic, cholinergic, and noradrenergic receptors, utilized for the management of nausea and vomiting.[9] The prevalent

side effects, including dizziness, constipation, and extrapyramidal symptoms, occur less frequently. The study reported minimal side effects, with one patient in the metoclopramide group experiencing extrapyramidal syndrome, treated with intravenous diazepam. Additionally, one patient in the ondansetron group reported a headache, which resolved spontaneously, and one patient in the prochlorperazine group experienced dizziness that necessitated no intervention.

Consequently, Ondansetron shown much greater efficacy in reducing IONV after cesarean sections performed under spinal anesthesia, accompanied by a minimal side effect profile. Datta et al. and Kang et al. observed that the occurrence of emetic problems following cesarean sections was associated with the presence of arterial hypotension. Consequently, we administered a preload of 20 ml/kg of lactated Ringer's solution to avert hypotension and positioned a folded towel beneath the right buttock to mitigate aortocaval compression. 10 Paxton et al. noticed in their study that nausea occurred in 25% of patients administered ondansetron, in contrast to 59% of those receiving metoclopramide.[11] Prophylactic prochlorperazine 12.5mg I/V is less efficacious than ondansetron 8mg I/V in mitigating nausea and vomiting. Ondansetron may be favored because to its reduced risk of extrapyramidal side effects and superior efficacy compared to prochlorperazine and metoclopramide.

Conclusion

This study demonstrated that intravenous Ondansetron, a 5HT3 antagonist administered at a dosage of 8mg, was a more effective prophylactic agent for managing perioperative nausea and vomiting under spinal anesthesia in parturients compared to intravenous metoclopramide, a dopamine receptor antagonist at 10mg, and intravenous prochlorperazine maleate, a D2 dopamine and histamine receptor antagonist at 12.5mg.

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