The Effect of Caffeine Ingestion in Prevention of Post-Operative Ileus After Caesarean Section: A Randomized Controlled Trial

Thesis

Submitted for Partial Fulfillment of Master Degree in Obstetrics and Gynecology

By

Madonna Gamal Garas Benyamine

M.B.B.Ch Faculty of Medicine- Assiut University

Supervisors

Prof. Amr Abd El-Aziz Mahmoud Nadim

Professor of Obstetrics & Gynecology

Faculty of Medicine - Ain Shams University

Dr. Reda Mokhtar Kamal Ghanem

Lecturer of Obstetrics & Gynecology

Faculty of Medicine - Ain Shams University

Faculty of Medicine

Ain Shams University

2019

Acknowledgment

*First of all, thanks to **God**, the merciful, the beneficent for helping me during this work.*

*I would like to express my indebtedness and deepest gratitude to **Prof. Amr Abd El-Aziz Mahmoud Nadim,** Professor of Obstetrics & Gynecology, Faculty of Medicine, Ain Shams University for his valuable advice, guidance and constructive criticism, also for the invaluable assistance and efforts he devoted in the supervision of this study.*

*I'll never forget, how co-operative was **Dr. Reda Mokhtar Kamal Ghanem,** Lecturer of Obstetrics & Gynecology, Faculty of Medicine, Ain Shams University, also he was encouraging all the time. It is honorable to be supervised by him.*

I would like to thank all the staff members of the Obstetrics & Gynecology department.

Finally, I would like to express my appreciation and gratitude to all my family, especially my caring and loving husband and supportive parents who enlighten my life.

Madonna Gamal Garas

Dedication

All gratitude to ***My Husband*** *and* ***Daughter***

I would like to dedicate this thesis to my husband for supporting me and pushing me forward all the time.

Special dedication to my lovely daughter

For their support, love and care

List of Contents

List of Tables

List of Figures

List of Abbreviations

Abb.	Full term
AARI	Average Annual Rate of Increase
CNS	Central Nervous System
CONSORT	Consolidated Standards of Reporting Trials
DHS	Demographic and Health Survey
DNA	Deoxyribonucleic acid
EEG	Electron Encephalograph
PDPH	Post-Dural Puncture Headache
POI	Post-Operative Ileus
SD	Standard Deviation
SPSS	Statistical Package for Social Science

Abstract

Background: Caesarian section delivery has become more prevalent than the vaginal delivery in Egypt, Many complications could occur after an abdominal surgery. So after a caesarian section, complications that are variable in its intensity could occur. One of the commonest but yet serious is the postoperative ileus**, Aim and objectives:** the aim of the study is to assess the value of caffeine ingestion in promoting intestinal motility and prevention of postoperative ileus after caesarean section and to assess the effect of caffeine in decreasing spinal headache after spinal anesthesia in women undergoing caesarean section. **Subjects and methods**: this is a randomized controlled trial that was conducted on 560 cases were recruited from emergency unit and inpatient wards in Ain Shams University maternity hospital, **Results**: that there was statistically significant difference between groups regarding, the bowel function after caesarean section among studied patients except the first time to defecation there was non-statistically significant difference between groups ($p > 0.05$),**Conclusion**: the conclusion of the study indicated that consuming coffee after caesarean section contributes significantly to faster restoration of intestinal function. Coffee is a popular drink and can be used to decrease the incidence of postoperative ileus-related complications and it is also related to reduction in post-operative spinal headache,

Keywords: Caesarian section, caffeine, intestinal motility, randomized controlled trial.

INTRODUCTION

Caesarian section delivery has become more prevalent than the vaginal delivery in Egypt. According to the Demographic and Health Survey (DHS) in 2014, 52 % of women in Egypt give birth by caesarian section. This makes the caesarian section one of the commonest abdominal surgeries in Egypt.

Many complications could occur after an abdominal surgery. So after a caesarian section, complications that are variable in its intensity could occur. One of the commonest but yet serious is the postoperative ileus ***(Sunil et al., 2001).***

Postoperative ileus is a predictable delay in gastrointestinal motility that occurs after abdominal surgery. Probable causes include disruption of the sympathetic/ parasympathetic pathways to the gastrointestinal tract, inflammatory changes through multiple pathways, and the use of opioids for the management of postoperative pain. ***(Artinyan et al., 2011)***

Postoperative ileus is presented with nausea, vomiting, abdominal distention, abdominal tenderness, and delayed passage of flatus and stool. These symptoms would remarkably worsen the patients' quality of life, increase length of hospital stay, and increase costs associated with postoperative recovery ***(Holte et al., 2002).***

Although ileus is so prevalent, preventative therapeutic options are still limited. Many trials have been made to prevent ileus, including administration of prokinetic drugs such as serotonin receptor antagonists ***(Toyomasu et al., 2011),*** neostigmine ***(Drake et al., 2016),*** alvimopam ***(Tan et al., 2007),*** and ghrelin agonists ***(Beck et al., 2014),*** early resumption of feeding ***(Zhuang et al., 2013),*** gum chewing ***(Ertas et al., 2013)*** and adequate pain control ***(Bragg et al., 2015).*** Unfortunately, none of these strategies has been completely successful. Coffee is one the most popular drinks in Egypt and the whole world. Several researches were done worldwide to study the effect of the caffeine present in coffee and resumption of intestinal motility after various abdominal surgeries ***(Brown et al., 1990; Müller et al., 2012).*** Recently the effect of coffee on prevention of postoperative ileus after caesarian section was researched ***(Rabiepoor et al., 2018).*** That's why this study is designed to determine the efficacy of the caffeine present in coffee in prevention of postoperative ileus.

AIM OF THE STUDY

Primary Objectives: to assess the value of caffeine ingestion in promoting intestinal motility and prevention of postoperative ileus after caesarean section.

Secondary Objectives: to assess the effect of caffeine in decreasing spinal headache after spinal anesthesia in women undergoing caesarean section.

Research Hypothesis:

In pregnant women after CS, caffeine ingestion may promote intestinal motility and prevent postoperative ileus.

Research Question:

In pregnant women after CS, does caffeine ingestion promote intestinal motility and prevent postoperative ileus?

Chapter 1

POSTOPERATIVE ILEUS

Although there is not currently one widely accepted definition of ileus ***(Vather et al., 2013)***, this condition has previously been described as a transient impairment of bowel motility after abdominal surgery or other trauma ***(Holte and Kehlet, 2000)***. Ileus is therefore considered to be an inevitable consequence of abdominal surgery ***(Gervaz et al., 2006; Tu et al., 2014),*** and commonly occurs following colorectal, gynaecological, thoracic and urological surgical procedures ***(Short et al., 2014).***

Postoperative ileus is an abnormal pattern of gastrointestinal motility after surgical procedures and may occur after both abdominal and non-abdominal operations. Ileus is defined as a pattern of bowel dysmotility that results in the accumulation of gas and fluid in the gastrointestinal tract with a decreased or delayed passage of flatus and bowel movements. Patients may experience signs and symptoms similar to a mechanical bowel obstruction including nausea, emesis, and abdominal pain. In fact, the Greek word "ileus" literally means "obstructed," which is, however, a misnomer because with ileus the lumen of the bowel is not obstructed. Rather, ileus is better described as a functional obstruction without mechanical blockage ***(Stewart and Waxman, 2010).*** Postoperative ileus has historically been considered an

unavoidable result of abdominal and other operations ***(Holte and Kehlet, 2000)*** because- to date- there has been no proven treatment to prevent or treat ileus.

Prevalence of ileus is difficult to estimate due to the lack of accurate reporting and lack of a standardised definition. Evidence indicates that ileus is most prolonged following large bowel surgery, and reports in this surgical discipline range from 3 to 32% of patients ***(Bisanz, 2011).*** There is evidence however that the introduction of laparoscopic surgery may reduce incidence of ileus ***(Fujii et al., 2014).***

It is inevitable that some degree of ileus will accompany any surgical procedure but the duration is strongly influenced by the type, location, and duration of the surgical procedure and is often exacerbated by intraoperative and postoperative pain control medication. Intestinal surgery is most commonly associated with the development of ileus, likely related to mechanical manipulation of the intestine. This can be demonstrated experimentally in animals such that progressive increases in manipulation of the intestine at surgery results in prolonged postoperative intestinal transit times, more dyscoordination of intestinal contractions and increased production of inflammatory mediators in the intestinal wall ***(Marderstein and Delaney, 2008).***

Ileus can lead to nausea, vomiting, abdominal discomfort, increased length of hospital stay and therefore

increased costs ***(Short et al., 2014).*** Additionally, it has been suggested that postoperative ileus can result in poorer wound healing, delays in time to mobilization and resumption of oral intake, and reduced patient satisfaction ***(Behm and Stollman, 2003).***

The pathogenesis of postoperative ileus is multifactorial ***(Bonventre et al., 2014),*** as numerous factors influencing the surgical stress response contribute to the development and duration of ileus. Its pathogenesis is contributed to by a complex series of relationships between inhibitory neural reflexes, neurotransmitter and inflammatory mediator release, and endogenous and exogenous opioids ***(Holte and Kehlet, 2000).*** More recently, animal and human models have suggested that inflammation in the intestinal wall may be directly involved ***(Türler et al., 2002).*** These include degree of bowel manipulation, level of surgical trauma, anaesthesia and effects of postoperative modifiers such as pain management with opiates ***(Short et al., 2014).*** Additionally, suggested risk factors for postoperative ileus include increasing age, high body mass index and ethnic minority ***(Svatek et al., 2010).***

There is no standard definition for the length of time that an ileus lasts, and authors variably select tolerance of diet or passage of flatus or stool as their criterion for recovery of bowel function. In fact, the data for the time of return of each of these intestinal functions is based on multiple, small series of patients. A reasonable definition for the length of ileus may be

the time from surgery until the passage of flatus or stool while tolerating oral diet, if appropriate. Some patients may not be offered oral diet because of the type of surgery they undergo, such as duodenal surgery or a high jejunostomy, or because of complications, such as an enterocutaneous fistula. Toleration of diet has been defined as tolerance of part, or all, of three successive meals without developing nausea or vomiting suggestive of POI ***(Delaney, 2004).***

A significant clinical problem is the ileus where the POI initially resolves, but recurs 1 or more days later, often after the patient has been discharged from hospital. This may be defined as cessation of passage of flatus or stool, with bloating and/or nausea/vomiting, requiring a change of in-hospital management or readmission to hospital. Readmission occurs in approximately 10% of patients undergoing major abdominal surgery, and about half these individuals are readmitted for gastrointestinal failure or some measure of recurring POI.

It is also important to be able to define patients who have prolonged POI; that is, POI that lasts long enough to become clinically unacceptable or problematic. Although no standard definition exists, a reasonable amount of time might be POI lasting longer than 5 days after laparotomy (although this would account for approximately 40% of patients) and longer than 3 days after laparoscopic surgery. Many surgeons consider that patients with no bowel function after these time points are entering the phase of clinically relevant prolonged POI.