INTRODUCTION

Cesarean delivery is defined as the birth of a fetus through incisions in the abdominal wall (laparotomy) and the uterine wall (hysterotomy). This does not include removal of the fetus from the abdominal cavity in the case of rupture of the uterus or in the case of an abdominal pregnancy ***(Cunningham et al., 2010).***

Its incidence has been quoted at 13–39%. It is as high as 50% in certain private settings, and China has been cited as having the highest rates of CS in the world. According to the World Health Organization, its acceptable incidence should be 5–15%, but the previous recommendation of 15% CS rate was withdrawn in June 2010. Their official statement read. There is no empirical evidence for an optimum percentage. What matters most is that all women who need CS receive it ***(Hellerstein et al., 2015).***

According to the latest data from 150 countries, currently 18.6% of all births occur by CS, ranging from 6% to 27.2% in the least and most developed regions, respectively. Latin America and the Caribbean region has the highest CS rates (40.5%), followed by Northern America (32.3%), Oceania (31.1%), Europe (25%), Asia (19.2%) and Africa (7.3%). Based on the data from 121 countries, the trend analysis showed that between 1990 and 2014, the global average CS rate increased 12.4% (from 6.7% to 19.1%) with an average annual rate of increase of 4.4% ***(Betrán et al., 2016).***

Women can have cesarean sections for many reasons such as multiple pregnancy, failure of labor to progress, concern for the baby, problems with the placenta, large baby, breech presentation, maternal infections such as human immunodeficiency virus or herpes, maternal medical conditions such as diabetes or high blood pressure, Maternal request for CS ***(NICE, 2012).***

Patients undergoing cesarean section will be given either general anesthesia, an epidural block, or a spinal block. An epidural block numbs the lower half of the body. An injection is made into a space in the spine in lower back. A small tube may be inserted into this space so that more of the drug can be given through the tube later if needed. A spinal block also numbs the lower half of the body. It is done the same way as an epidural block, but the drug is injected directly into the spinal fluid ***(Staiku et al., 2014).***

Traditionally, patients are not given fluids or food after abdominal surgery until bowel function returns, as evidenced by bowel sounds, passage of flatus or stool, or a feeling of hunger ***(Guo et al., 2015).***

The rationale of this practice is to prevent postoperative nausea, vomiting, distention and other complications. However, withholding oral feedings may lead to intestinal ileus, which can prolong the length of hospital stay and increase the financial burden ***(Iyer et al., 2009).***

Low midline skin incision, swab packing during operation or cleaning amniotic fluid or blood in the abdominal cavity and closure of the peritoneum may also

affect the return of bowel function ***(Miedema et al., 2003).*** All these factors need to be considered when determining the applicability of the findings of the trials on 'early' versus 'delayed' initiation of fluids and solid food.

There is a need for well-designed randomized trials to compare early versus delayed initiation of oral fluids and/or intake food after caesarean section, regardless of type of settings. The type of abdominal incision, peritoneal closure, the level of bowel irritation to aid the interpretation of the results of such trials ***(Liabsuetrakul, 2004).***

Although cesarean section is a major abdominal surgery, it is different from other abdominal surgeries. In cesarean sections patients are well prepared preoperatively especially if the case is an elective CS. Usually the patients are young and in a good health condition. CS is relatively short operation with minimal bowel manipulation. In the past, CS was believed to be equivalent to other major abdominal surgeries and its postoperative management was following similar lines. It was believed that abdominal surgeries including CS limits bowel mobility; thus; a postoperative ileus was feared to be of common incidence. Hence, ambulation was delayed and oral feeding was started only after bowel sounds were audible and patient had passed flatus. It was believed that bowel needs rest after those surgeries and that starting oral feeding will interfere with bowel functions and this belief wasn’t only prevalent among the public but even the medical staff believed the same ***(Kaur et al., 2015).***

Masood and his colleagues (2011) found in their study that 61.6% of the doctors in obstetrics and gynecology had the same beliefs that early initiation of diet may lead to ileus and wound disruption whereas 3.4% feared of burst abdomen.

In recent years, with the development of enhanced recovery surgery, the safe and effective promotion of the recovery of gastrointestinal function after surgery and prevention of postoperative complications have caused widespread concern among medical staff. Several interventions aimed at accelerating the recovery of gastrointestinal motility after surgery, including probiotics, ambulation and gum chewing, have been proposed ***(Wallstrom et al., 2013).***

The benefits of early feeding over traditional oral feeding are also being evaluated in some clinical trials. Some previous meta-analysis reviews in patients undergoing elective colorectal surgery have demonstrated that early feeding can reduce hospital stay and the total postoperative complications ***(Zhuang et al., 2013).***

Different factors affect patient's satisfaction. The secure of patient needs is a main factor to improve quality of medical services. Patient's opinion about quality of postoperative care is valuable for managers. Postoperative care and satisfaction of women who underwent a cesarean section is an important aspect and demands due attention, because they are different from other patients and don't have just the role of a patient ***(Adeli et al., 2010).***

Actually they are mothers that should care and breast feed their infant immediately after surgery. Some previous studies have shown early post cesarean feeding is a main factor in women's satisfaction ***(Adeli et al., 2010).***

There is no scientific evidence to withhold oral feeds for a long duration after CS, yet it is the practice in most hospitals. Early oral feeding is claimed to improve patients' satisfaction, helps in early mobilization and results in shortened hospital stay. Cost of oral feeding is much less than the daily cost of intravenous fluids, intravenous sets, cannulas and nursing care ***(Kathpalia 2017).*** So, we need also to evaluate women satisfaction using a reasonable method and to discover the effect of early oral hydration on women's satisfaction in our study.

PROTOCOL OF THE STUDY

What is already known on this subject?

What does this study add?

Traditionally, Patients are not given fluids or food after abdominal surgery until bowel functions returns, as by bowel sounds, passage of flatus or stool, or a feeling of hunger.

This study will evaluate early oral hydration rather than traditional delayed method after cesarean section.

Aim of the work:

The aim of this study is to evaluate prospectively the benefits and safety of early hydration on bowel movement after Cesarean Section.

Research question:

Is early oral hydration safe and effective in early restoration of good intestinal movement and functions ?

Research Hypothesis:

Null Hypothesis: Early oral hydration has no effect on the postoperative return of intestinal functions, postoperative complications and hospital stay.

Alternative Hypothesis: Early oral hydration has more beneficial effects than late oral hydration on the postoperative return of intestinal functions, postoperative complications and hospital stay.

Outcomes:

- **Primary outcomes:**

  - Audible intestinal sounds, Time to first bowel movement.

  - Postoperative Pain Perception measured with a visual analogue scale (VAS) before being discharged.

- **Secondary outcomes:**

  - Postoperative anorexia, nausea, vomiting.
  - Time for 1st breast feeding.
  - Abdominal distension.
  - Amount of given IV fluids.
  - Need for pain analgesics.
  - Length of hospital stay.

Patients and Methods:

Study:

Study Design: A randomized controlled trial.

Study setting: The study will be conducted in Ain Shams University Maternity Hospital.

- Full detailed history focusing on present, past & obstetrics history.
- Routing general and abdominal examinations focusing on signs suggesting medical disorders for hypertension & diabetes such as (large baby weight, large maternal weight, blood pressure exceeding 140/90).
- CS will be executed by a senior resident or a registrar to ensure competency.

- **Each patient will be subjected post-operatively to full routine postoperative Follow-up including:**

❖ Vital signs will be checked every half an hour during the first 2 hours, then every 1 hour for the next 4 hours, then every 6 hours.

❖ Massage for the uterus every 15 minutes for the first 2 hours focusing on tone of uterus & amount of vaginal bleeding.

❖ Urine output monitoring as regarding amount and color, taking in consideration the removal of the catheter after mobilization.

❖ Mobilization of the patient will take place once the effect of regional anesthesia has ended-up, around 3 to 4 hours post-operative.

❖ Every patient will receive 4 liters of IV Fluids along the 1st day post-operative.

❖ Patient will start oral feeding with soft diet progressing gradually to ordinary food once she has passed flatus.

❖ Wound site will be checked in the 2nd day post-operative focusing on tone of the uterus & vaginal bleeding.

❖ Patients will be discharged after 24 hours assuming that general condition is good and that the patient is open bowel with good oral intake.

The selected patients will fulfill the following criteria:

- Term Singleton Pregnancy
- Uncomplicated Elective LSCS.
- Time of CS doesn't exceed 90 Minutes.
- Average blood loss during and after CS (doesn't exceed 1000cc).
- All patients will be under spinal anesthesia.

Exclusion criteria:

- Postpartum Hemorrhage.
- Surgical Complications such as intestinal injury.
- Medical Disorders such as Diabetes & Hypertension.
- Factors that may influence postpartum blood loss as Anemia, Multiple Pregnancy, Polyhydramnios.
- Use of tocolytic drugs.

Study population:

The present study will be conducted on 290 women recruited from the delivery ward of our hospital after they had received information on the purpose and course of the study from the medical investigator and had provided the written consent, The 290 participants will be divided into two groups using simple random distribution technique.

Randomization and Allocation concealment:

Randomization based on the sequence generation created by computer and the randomization tables will be kept with the study supervisor. Consenting patients fulfilling inclusion criteria will be randomized into one of the 2 groups. Randomized allocation will be kept in opaque sealed envelopes, with enrollment numbers written on the envelopes. The envelopes contain a card on which the designated study group is written. After enrollment of the patients in the study, the envelopes marked with study number will be unsealed and the patients allocated to either groups:

- **Group (A) "Study Group":**

Women in Group A (n = 145) will receive 200 ml of sugar-free water within 1 hour of delivery.

- **Group (B) "Control Group":**

Women in Group B (n = 145) will receive 200 ml of sugar-free water 6 hours after delivery.

Sample size calculation:

Assuming an effect size as regard bowel functions ranging between 0.5 and 1.0, a sample size of 145 in each group is enough to detect the least effect, if two, at 0.005 alpha end and 0.95 power of the test.

AIM OF THE WORK

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Research Hypothesis:

Null Hypothesis: Early oral hydration has no effect on the postoperative return of intestinal functions, postoperative complications and hospital stay.

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CESAREAN DELIVERY

Cesarean delivery is defined as the birth of a fetus through incisions in the abdominal wall (laparotomy) and the uterine wall (hysterotomy). This does not include removal of the fetus from the abdominal cavity in the case of rupture of the uterus or in the case of an abdominal pregnancy ***(Cunningham et al., 2010).***

Table (1): Royal College of Obstetrics and Gynecology 2001: Definition of types of Cesarean section

Type	Definition
Emergency	Immediate threat to life of women or fetus within minutes. Within the next 30 minutes. Some examples are: abruption, cord prolapse, scar rupture, scalp ph.<7.2 and prolonged FHR deceleration< 80 bpm.
Urgent	Maternal or fetal compromise which is not immediately life threatening. the delivery should be completed within 60-75 minutes and cases with FHR abnormalities are those of concern.
Scheduled	Continuation of pregnancy is likely to affect the mother or fetus in hours or days. Some plan should be in place to deliver before further deterioration occurs. It may be a case of failure to progress where the C.S is planned within next hour or two or a case with preeclampsia where

Type	Definition
	The liver or renal function tests are gradually deteriorating where the C.S is planned for within hours to days.
Elective	The main principle being to carry out C.S as late as possible in gestation without compromising the maternal or fetal health. It is generally done around 39 weeks as the incidence of tachypnea of the newborn is much less after this gestation.
Peri-mortem	Carried out in extremis while the mother is undergoing active resuscitation.
Post-mortem	Carried out after death of the mother to save the fetus.
Maternal Request	Primary prelabor cesarean delivery on maternal request in the absence of any maternal or fetal indications.

Frequency:

The rate of caesarean delivery has increased dramatically over the past decade. According to the latest data from 150 countries, currently 18.6% of all births occur by CS, ranging from 6% to 27.2% in the least and most developed regions, respectively. Latin America and the Caribbean region has the highest CS rates (40.5%), followed by Northern America (32.3%), Oceania (31.1%), Europe (25%), Asia (19.2%) and Africa (7.3%). Based on the data from 121 countries, the trend analysis showed that between 1990 and 2014, the global average CS rate increased 12.4% (from 6.7%

to 19.1%) with an average annual rate of increase of 4.4% ***(Betrán et al., 2016).***

Table (2): Caesarean section rates in 150 countries categorized according to United Nations geographical grouping in 2014[a].

Region/subregion[b]	Births by cesarean section (%)	Range (minimum to maximum) (%)	Coverage of estimates (%)
Africa	7.3	1.4–51.8	92.8
Eastern Africa	3.9	1.5–9.6	96.3
Middle Africa	5.8	3.8–10.0	83.2
Northern Africa	27.8	6.6–51.8	97.4
Southern Africa	-	-	-
Western Africa	3.0	1.4–11.4	100
Asia	19.2	1.7–47.5	97.8
Eastern Asia	34.8	12.5–36.6	100
South-central Asia	11.4	3.6–47.9	100
South-eastern Asia	14.8	1.7–32.0	91.4
Western Asia	26.8	4.8–47.5	87.4
Europe	25.0	13.9–38.1	98.6
Eastern Europe	23.7	15.8–36.3	100
Northern Europe	22.4	14.7–26.6	100
Southern Europe	30.7	13.9–38.1	92.7
Western Europe	24.5	15.6–32.2	100
Latin America and the Caribbean	40.5	5.5–55.6	93.7
Caribbean	27.5	5.5–53.4	81.8
Central America	38.2	16.3–45.2	100

Region/subregion[b]	Births by cesarean section (%)	Range (minimum to maximum) (%)	Coverage of estimates (%)
Southern America	42.9	13.3–55.6	91.7
Northern America	32.3	27.1–32.8	100
Oceania	31.1	6.2–33.4	62.3
Australia/New Zealand	32.3	32.4–33.4	100
World total	**18.6**	**1.4–56.4**	**96.1**
Least developed regions	6.0	1.4–41.1	91.8
Less developed regions	20.9	1.7–56.4	96.9
More developed regions	27.2	13.9–38.1	99.2

[a] If the data in 2014 was not available, the latest data available from 2005 was used instead.

[b] Countries categorized according to the UN geographical grouping. Number of live births in each country in 2010 was used as a weight to calculate the regional coverage.