INTRODUCTION

Caesarean delivery is a procedure in which a fetus is born through an incision in the abdomen or uterus of the mother ***(ACOG, 2010).***

Cesarean delivery is the most popular obstetric procedure worldwide and the CS rate has been steadily increased ***(Cunningham et al., 2010).***

The origin of the term caesarean delivery is unknown. The theories that this was the birth of Julius Cesar, and thus this operation was known as the Caesarean operation. This theory was weakened by several factors. First, Julius Cesar's mother lived in (100 BC) for many years after his birth, and the procedure was invariably fatal as late as the 17th century. Second, the surgery, whether carried out on living or dead women, is not mentioned before the Middle Ages by any medical author ***(Cunningham et al., 2002).***

Over the past few decades, CS rates have risen worldwide in both developed and developing countries. The WHO Global Survey on Maternal and Prenatal Health, which was performed in 24 regions of eight countries in Latin America between 2004 and 2005 and gathered data for all women admitted to delivery in 120 randomly selected institutions, found a median delivery rate of 33%; rates of up to 51% were registered in private hospitals ***(Villar et al., 2006).***

The reasons for this rise in CS delivery are multifactorial and include the increasing number of women with previous CS delivery the rise in multifetal gestations, the use of intrapartum electronic fetal monitoring, improvements in obstetric practice, legal medical issues, changes in parental and cultural expectations of the result of pregnancy and maternal autonomy in decision-making on delivery ***(Mishra and Ramanathan, 2002).***

Maternal mortality and particularly morbidity with CS delivery is increased to about twice the rate after a vaginal delivery relative to vaginal delivery. The total maternal mortality rate is 6-22 deaths per 100,000 live births, with the operating procedure itself directly attributable to about one-third to one-half maternal deaths following delivery of CS. Much of this rise in mortality is that associated with surgery and partially due to the circumstances that may have contributed to the need to provide CS. Major morbidity and mortality sources may be associated with infection sequelae, thromboembolic disease, esthetic complications, and surgical injury ***(Cunningham et al., 2009).***

Women who had previous CS were more likely to experience problems with the following births, including increased risk of birth malpresentations, APH, placenta previa, placenta accreta, prolonged labor, risk of scar dehiscence, uterine rupture, preterm birth ***(Kennare et al., 2007).***

Females are now four times more likely to be born with CS than they were 30 years ago. Most technologies are built to lower the distribution level of CS. Around one-third of CS is electively performed and two-third are performed as emergency procedures. Primary CS contributes significantly to assessing a woman's future obstetric course. The most popular indication for an elective procedure among the primary CS deliveries is breech presentation and for an emergency procedure includes labor dystocia and non-reassuring fetal heart rate tracings ***(Belgrave, 2003).***

Most contributed to the overall CS rate is primary caesarean deliveries. Broad variance was found among obstetricians in clinical practice. The main factor for these inconsistencies in clinical practice was the lack of adherence to conventional protocols and the lack of appropriate standards for CS levels, labor induction, and failed induction. Induced cases contributed most to primary CS ***(Nazia et al., 2013).***

It is important to have a method to monitor and compare CS levels in the same environment over time and between different settings to consider the drivers of increasing CS and to recommend appropriate measures to reduce and improve CS rates as required. WHO appreciated the 10-group Robson CS classification in 2014 and FIGO proposed the Robson classification system in 2016 ***(Robson et al., 2015).***

The WHO recommends the Robson classification system as a global standard for the assessment, monitoring and correlation of CS rates over time within and between healthcare facilities. To help healthcare facilities adopt the Robson classification, the WHO will develop guidelines for their use, implementation and interpretation, including standardization of terms and definitions ***(Hoxha et al., 2017).***

This classification is not complicated, robust, reproducible, clinically relevant and prospective. It makes it possible to compare and analyze CS rates within and across these women's groups. Most countries around the world have used the Robson Classification quickly and gradually ***(Triunfo et al., 2018).***

There are a variety of procedures that have been used for decades that should be removed by systematic, evidence-based practices in order to efficiently reduce the rate of CS deliveries. Nonetheless, there is a need to strengthen the work climate that physicians face, the social and medical legal stresses. Through such perinatal quality improvement efforts as an approach to the health system, changes in the environment will allow clinicians to adopt the practices described ***(Caughey et al., 2017).***

It involves interventions that are clinical or non-clinical. Clinical interventions tend to target an individual woman's unique clinical practice such as [VBAC] or labor induction. The non-clinical approach requires women's health training and the use of clinical practice recommendations based on evidence ***(Witt et al., 2015).***

AIM OF THE WORK

The aim of this work is:

- To describe the frequency of cesarean section by Robson classification in Ain Shams university maternity hospital and to determine the main groups having the highest C.S rates.
- To describe additional data as maternal and neonatal outcomes.

Chapter 1
CAESAREAN SECTION

Introduction

Caesarean section is a surgery for the abdominal delivery of a fetus. A CS is often needed when the fetus or mother is at risk from a vaginal delivery. Such as obstructed labor, twin childbirth, or hypertensive disorders, breech, and placenta, or umbilical cord disorders. Based on the shape of the pelvis of the mother or the record of a prior CS, a CS delivery can be carried out. It may be possible to undergo a vaginal birth test after C-section. The WHO recommends that only when medically necessary, CS should be performed. Some CS are performed on maternal request without medical reasons ***(Kumari et al., 2018).***

A Caesarean section is a surgical procedure that results if performed for medical reasons. On the opposite, there is evidence that possibly needless CS can threaten the lives and well-being of women and their children, both in the short and long term ***(Kingdon et al., 2018).***

The increase in the Caesarean section affects low, moderate and high-income nations, although the effects of needless CS vary based on the human and financial resources available and the ability to perform CS safely and handle related complications ***(Chen et al., 2018).***

About 23 million C-sections were rendered worldwide in 2012. Over 45 countries worldwide have CS rates below 7.5%, while over 50 have rates over 27%. Efforts are being made to improve access to unused CS and to reduce its use ***(Sandall et al., 2018).***

CS leads to an overall increase in low-risk birth outcomes. They also take longer to heal than vaginal birth (about six weeks). The increased risks include neonatal and postpartum bleeding breathing problems in the child. It is advised that CS should not be done without a medical indication before 39 weeks of pregnancy. This delivery method does not seem to influence the resulting sexual function ***(Murkoff, 2016).***

CS takes about an hour, a spinal block can be performed where the person is conscious or under general anesthesia. A urinary catheter is used to clear the bladder and an antiseptic solution is used to wash the abdomen's skin. An incision of about 6 inches is made through the lower abdomen of the mother. The uterus is then opened and the baby is delivered with a C-shaped incision. Then the incisions are closed. As soon as she is conscious, a woman will begin breastfeeding. Often it takes several days to heal fully ***(Ayob, 2018).***

Historical background of CS:

An explanation states that in the Middle Ages the word cesarean was derived from the Latin verb "cut" and "section" is derived from the Latin verb seco, which also means "cut" ***(Cunningham et al., 2002).***

Pliny the Elder theorized that the name of Julius Caesar comes from a CS-born relative, but the reality of this is being debated. The Ancient Roman CS was first done to extract a child from a mother's womb who died at birth ***(Ye et al., 2016).***

A similar procedure to the CS is stated in the Babylonian Talmud, an ancient Jewish religious text. The treatment is called dofen yotzei. The permissibility of doing a CS on a dying or dead parent is also discussed at length. There is also some reason to believe that the procedure was routinely continued by Jewish women in Roman times ***(Betran et al., 2015).***

CS was considered an extreme procedure for a long time, carried out only when the woman was already dead and thought powerless ***(Betrán et al., 2016a).*** Survival of both mother and baby became common with the introduction of antiseptics and anesthetics in the 19th century ***(Sandall et al., 2018).***

Jakob Nufer, a pig gelder, is supposed to have performed the operation on his wife after prolonged labor with her survival in an account from the 1580s in Siegershausen, Switzerland. The technique has had a high mortality rate for

most of the period since the 16th century. The mortality rate in Great Britain and Ireland was 85% in 1865. Main steps have been taken to reduce mortality:

- Application of Ferdinand Adolf Kehrer's transverse incision technique to stop bleeding in 1881 is considered to be the first modern CS to be carried out.
- Max Sänger's introduction of uterine suturing in 1882
- Hermann Johannes Pfannenstiel's modification in 1900
- Extraperitoneal CS followed by low transverse incision
    - Adherence to asepsis standards
    - Advancement in anesthesia
    - Blood transfusion
    - Antibiotics ***(West et al., 2017)***

During the 19th century, European travelers in Africa's Great Lakes region observed that CS was performed on a regular basis. Usually, the expectant mother was anesthetized with alcohol, and medicinal mixtures were used to promote healing. Between 1817 to 1828, James Barry was the first European physician to carry out an effective CS in Africa ***(Cunnington et al., 2016).***

In 1794, Mason County, Virginia, held the first active CS to be conducted in the United States. Dr. Jesse Bennett carried out the operation on his wife Elizabeth ***(Kuhle et al., 2015).***

Indications of CS:

CS is advised where vaginal delivery poses a risk to the mother and child, often done on maternal demand for personal and social purposes ***(Paterson-Brown and Howell, 2016).***

Taking into account CS indications: repeat CS, labor dystocia and fetal distress ***(Gulfareen et al., 2009).***

Labor risks or increased risk of vaginal delivery include:

- Malformation such as breech or transverse position.
- Extended labor, inability to proceed, obstructed labor or dystocia.
- Fetal distress.
- Cord prolapse.
- Uterine rupture or imminent uterine rupture or dehiscent scar.
- Pregnancy hypertension.
- Maternal or fetal distress after rupture of the amniotic membrane.

- Placental disorders such as placenta Previa, placental abruption and placenta accrete, delayed labor induction.
- Failed instrumental delivery.
- Fetal macrosomia.
- Umbilical cord abnormalitis (vasa Previa, multi-lobate like bilobate or succenturiate-lobed placentas, velamentous insertion) ***(Kotdawala and Pandya, 2016).***

Associated Disorders like:

- Pre-eclampsia.
- Prior pregnancy at high risk.
- Woman with high viral load HIV infection.
- Sexually transmitted diseases such as genital herpes very recently before the start of labor and, if administered vaginally, may cause fetal infection.
- Prior classical caesarean section.
- Previous rupture of uterus.
- Prior perineum curing complications from prior births and Crohn's disease
    - Uterine malformations (bicornuate uterus).
    - Rare cases of abortion after mother's death ***(Sonntag, 2016).***

Twins: A trial for vaginal delivery between 37 and 38 weeks is recommended for stable twin deliveries where both twins are cephalic. In this situation, vaginal delivery does not exacerbate either infant's result relative to CS. The best delivery form is complicated where the first twin is head first and the second is not. When the first twin is not head down at the point of labor starting, a CS should be recommended. Although the second twin typically has a higher frequency of complications ***(Petrangelo et al., 2018).***

Breech birth: First born buttock babies are more likely than first born heads to be affected during normal birth. For example, during birth the baby may not get enough oxygen. With a scheduled CS, these issues can be growing and healthier than vaginal births. There was preliminary evidence that children born with CS had more issues with their wellbeing ***(Song et al., 2017).***

Relative indication:

Maternal request:

When scientifically non-indicated, elective CS may be performed. Approximately 7 percent of women in the UK, Sweden and Australia chose CS as a delivery method. The National Institute for Health and Care Quality advises that if data on the threat of a scheduled CS has been given to a person

and she still insists on the treatment to be provided, and should take place at or after 39 weeks of gestation. There is no evidence that this can reduce mother-to-child transmission of hepatitis B and hepatitis C ***(Juhasova et al., 2018).***

Many uro-gynecologists say that to avoid pelvic floor pain, patients must accept CS. This is a highly controversial issue. In the long term, genetic factors seem to play an important role, masking the impact of transmission ***(Guendelman et al., 2017).***

Timing: A study found that, given medical pressure to postpone delivery until 39 weeks of gestation, waiting to meet this threshold may increase maternal risk before undertaking repeated CS delivery. The study shows that the ideal delivery time is 38 weeks for women with 2 prior deliveries and 37 weeks for women with 3 or more ***(Jahnke, 2016).***

Classifications of CS:

Sections in Caesarean have been classified in different ways. Another method of classification systems is to classify them according to the severity of the operation, the mother's features or others ***(Bolla et al., 2018).***

I. By urgency:

CS is known as either an elective surgery or an emergency surgery. Classification is used to help communicate the most appropriate method of anesthesia between the obstetric, midwifery and anesthetic group. It is important to decide whether to conduct general anesthesia or local anesthesia, depending on many signs, including the importance of childbirth, as well as the woman's health and obstetric history. Regional anesthetics for the woman and the infant is almost always better, but sometimes general anesthetics are healthier for one or both ***(Chung, 2017).***

With medical signs that have established before or during pregnancy, or preferably after 39 weeks of gestation, a planned caesarean often called elective scheduled caesarean, done in advance, is most frequently performed. In the United Kingdom, this section is graded as Grade 4, which is tailored to match the mother and hospital staff, Or as a section of grade 3 if no maternal or fetal compromise is required but early delivery. Emergency CS is conducted in pregnancy where originally a vaginal delivery is expected, but a suggestion has arisen for delivery of CS. Also graded as grade 2 needing arrival within 90 minutes of the ruling, but no immediate threat to the woman's or fetus' existence. Or grade 1 if delivery within 30 minutes of the decision is required: immediate threat to the mother's or baby's life or both ***(Kruit et al., 2015).***

II. By characteristics of the mother:

- ***Caesarean delivery on maternal request:***

Conduct of a pregnancy through a CS, unless required by the pregnant woman, but not clinically confirmed. In some research, elective caesareans showed increased health problems in the newborn at 38 weeks. Nevertheless, if there is a medical reason, expected CS may be arranged sooner ***(Hicklin et al., 2018).***

- ***Repeated caesarean section:***

In future pregnancies, mothers who have had a CS before are more likely to have a CS than mothers who have never had a CS. There are prerequisites in women's ability to have a VBAC ***(Ji et al., 2015).***

- ***Peri-mortem caesarean:***

A resuscitative hysterotomy is an emergency CS delivery done where there has been maternal cardiac arrest to help resuscitate the mother by extracting the aorto-caval compression made by the gravid uterus. By comparison to other types of CS, fetal wellbeing is only a secondary priority, And the operation can be carried out even before the fetal viability mark if it is found to be useful to the mother ***(Johri et al., 2017).***