Introduction

Delivery by cesarean section is by far one of the most commonly performed obstetric operations all over the world ***(Ramadani, 2004).*** Cesarean section refers to the procedure where a baby is delivered through an incision on the abdominal wall and uterus of the mother. It is life saving and aims to preserve the health of the mother and her baby ***(Enkin et al., 2000 and Hall and Bewley, 1999).***

The type of anesthesia used and the care with which it is administered is an important determine of the outcome of cesarean section ***(Anderson et al., 1987 and Enkin et al., 2000)***. Both spinal and general anesthesia used for cesarean section have advantages and disadvantages and there is no method which is completely ideal. The most important factors for choice of anesthesia are; pregnant systemic problems and wishes, the urgency of the operation, and the surgeon and the anesthetists experience. In cesarean section, especially the general anesthesia, intraoperative blood loss can be increased due to changing blood flow, uterine contraction and uterine vascular resistance ***(Ahmet et al., 2009).***

General anesthesia refers to the loss of ability to perceive pain associated with loss of conscious produced by intravenous

or inhalation anesthetic agents, the risks include the aspiration of stomach content, failed intubation and respiratory problem for both mother and baby ***(Afolabi et al., 2012).***

General anesthesia has also been associated with a great risk of maternal blood loss compared with spinal anesthesia. However it is a more quickly administered procedure and is often preferred in emergencies when speed is important **(*Enkin et al., 2000*)**.

Spinal anesthesia refers to the use of local anesthetic solutions to produce circumscribed area of loss of sensation. With spinal anesthesia, the drug is injected directly through a catheter that has been introduced into the subarachnoid space. Spinal anesthesia causes substantial drop in maternal blood pressure, which may affect both mother and fetus ***(Dick, 1995).*** Over the last 30 years, the use of regional anesthesia especially spinal anesthesia is rapidly increasing **(*Ashok, 2010*).**

Spinal anesthesia tends to be superior to general anesthesia in airway management and intraoperative blood loss in the process of cesarean section. In cesarean section, it is known that women receiving spinal anesthesia have decreased intraoperative blood loss compared to women receiving general anesthesia ***(Jeong et al., 2012).***

Historical Background

The origin of the term *cesarean* is obscure, and three principal explanations have been suggested.

In the first, according to legend, Julius Caesar was born in this manner, with the result that the procedure became known as the Cesarean operation. Several circumstances weaken this explanation. First, the mother of Julius Caesar lived for many years after his birth in 100 BC, and as late as the 17th century, the operation was almost invariably fatal. Second, the operation, whether performed on the living or the dead, is not mentioned by any medical writer before the middle ages ***(Pickrell, 1935).***

The second explanation is that the name of the operation is derived from a Roman law, supposedly created in the 8th century BC by Numa Pompilius, ordering that the procedure be performed upon women dying in the last few weeks of pregnancy in the hope of saving the child. This lex regia (king's rule or law) later became the lex caesarea under the emperors, and the operation itself became known as the cesarean operation. The German term Kaiserschnitt (Kaiser cut) reflects this derivation ***(Pieter and Dongen, 2009).***

The third explanation is that the word cesarean was derived sometime in the middle ages from the Latin verb caedere, to cut. This explanation seems most logical, but exactly when it was first applied to the operation is uncertain. Because section is derived from the Latin verb seco, which also means *cut,* the term *cesarean section* seems tautological—thus *cesarean delivery* is used. In the United States, the *ae* in the first syllable of *caesarean* is replaced with the letter *e*. In the United Kingdom, Australia, and most commonwealth nations, the *ae* is retained ***(Cunningham et al., 2010).***

Moreover, Palmer C added that although the Roman law, lex caesarea, of 715 BC decreed that women dying in late pregnancy should have the infant delivered through an abdominal incision, the term 'cesarean section' (CS) derives neither from this nor the birth of Julius Caesar in 100 BC. It arose in the middle ages from the Latin verb caedare 'to cut' and its derivative caesura, 'a cut or pause in a line or verse'. The word 'section' also comes from Latin secare 'to cut', making the term 'cesarean section' somewhat redundant. The first successful cesarean delivery probably occurred late in the middle ages, although it was almost always fatal until the nineteenth century. With improved surgical techniques, CS is in many situations now the delivery mode of choice ***(palmer et al., 2002a).***

Obstetrical Maternal Mortality Ratio

Maternal mortality ratio in developing countries is 240 per 100,000 births versus 16 per 100,000 in developed countries. There are large disparities between countries, with few countries having extremely high maternal mortality ratios of 1000 or more per 100,000 live births. There are also large disparities within countries, between people with high and low income and between people living in rural and urban areas ***(World Health Organization, 2012).***

In Egypt 2010, maternal mortality ratio is 66 per 100,000 live births ***(World Health Organization, 2011).***

Major complications that account for eighty % of all maternal deaths are:

- Severe bleeding (mostly bleeding after child- birth).
- Infections (usually after childbirth).
- High blood pressure during pregnancy (preeclampsia and eclampsia).
- Unsafe abortion.
- The remainder are caused by or associated with diseases such as malaria, and AIDS during pregnancy ***(World Health Organization, 2012).***

The risk of maternal mortality is highest for young girls under 15 years old ***(Conde et al., 2004)*.** Complications in pregnancy and childbirth are the leading cause of death among young girls in most developing countries ***(Patton et al., 2009).***

Incidence of Cesarean Section

Rates of cesarean section are of concern in both developed and developing countries ***(Betran et al., 2007).*** In more-developed countries; it have been rising since 1970, and vary greatly between less-developed countries. Present estimates, based on data from more-developed countries need to be validated with data from less-developed countries ***(Dumont et al., 2001).***

Latin America and the Caribbean show the highest rate (29.2%), and Africa shows the lowest (3.5%). In developed countries, the proportion of cesarean births is 21.1% whereas in least developed countries only 2% of deliveries are by CS ***(Betran et al., 2007).*** In Egypt, more than one-quarter of deliveries in the five-year period before the 2008 (Egyptian demographic and health survey, EDHS) were by cesarean section. Women delivering in a private health facility were slightly more likely than women delivering in a government facility to have a Cesarean delivery. The likelihood of a Cesarean delivery increased with the age of the mother and

decrease with the child's birth order. Thirty-seven percent of urban births were Cesarean deliveries compared to 22% of rural births (figure 1) ***(World Health Organization, 2008).***

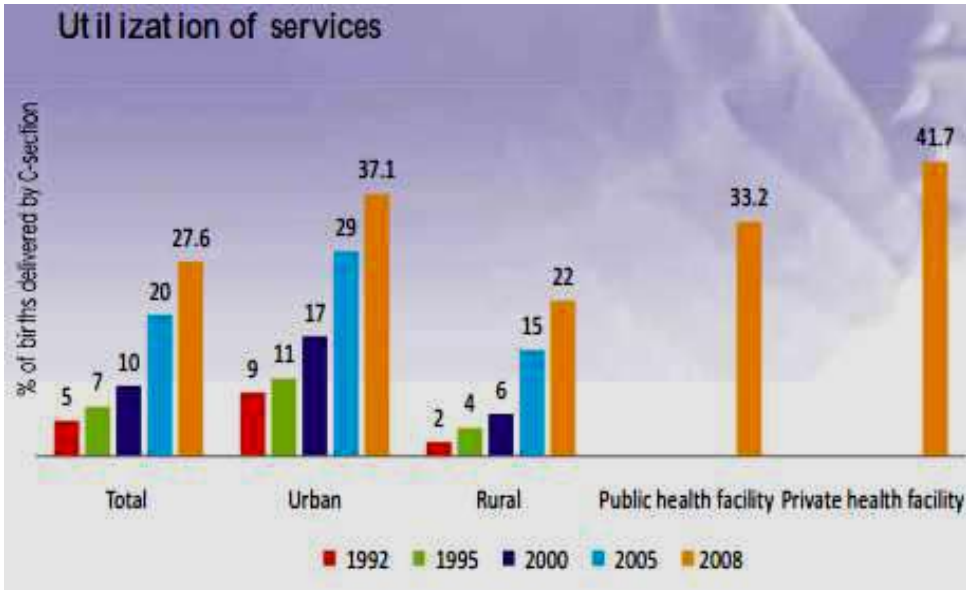

Figure (1): *The C-section rate in Egypt 2008* ***(World Health Organization, 2008).***

Considering place of residence, urban Lower Egypt had the highest proportion of Cesarean deliveries (43%) followed by the Urban Upper Egypt (31%). The likelihood of a Cesarean delivery increased with both the mother's educational status and was greater among women working for cash than among other women (figure 2) ***(World Health Organization, 2008).***

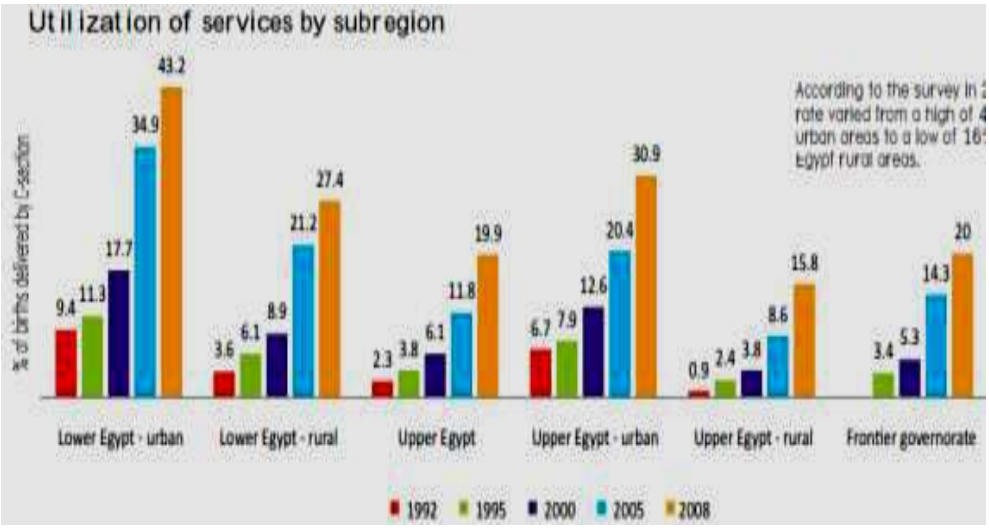

Figure (2): *The C-section rate in Egypt sub-region 2008* ***(World Health Organization, 2008).***

The rate of Cesarean deliveries peaked at 45 percent among women in the highest wealth quintile compared to 14% among women in the lowest quintile (figure 3) ***(World Health Organization, 2008).***

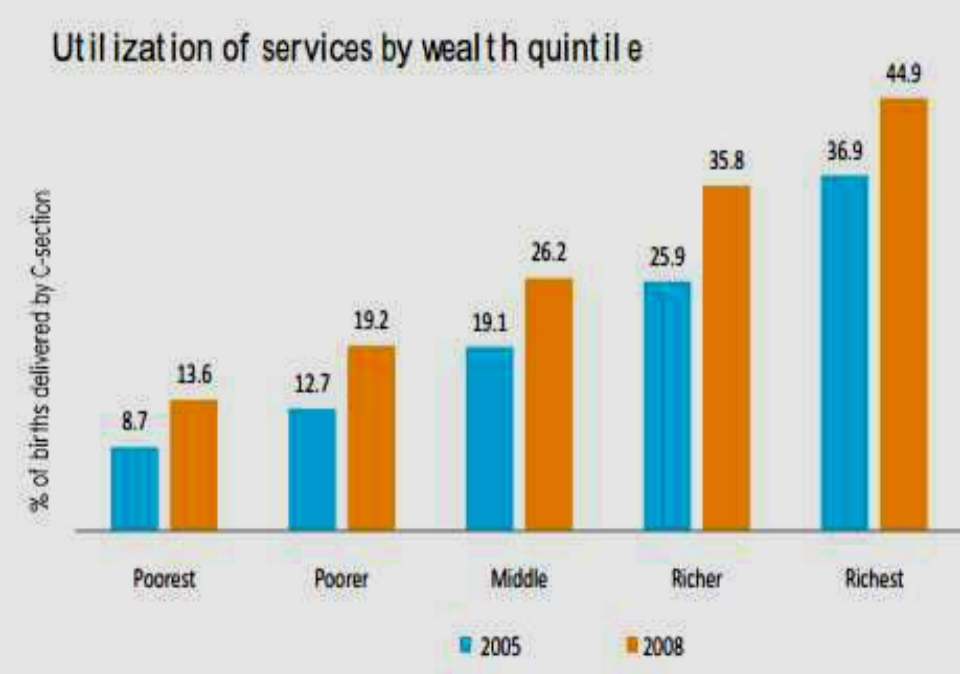

Figure (3): *The C-section rate by wealth quintile in Egypt 2008* ***(World Health Organization, 2008).***

Reasons for the Continued Increase in the Cesarean Rates

The reasons for the continued increase in the cesarean rates are not completely understood, but some explanations include the following:

1. Women are having fewer children, thus, a greater percentage of births are among *nulliparous,* who are at increased risk for cesarean delivery.

2. The average *maternal age* is rising, and older women, especially nulliparous, are at increased risk of cesarean delivery ***(Menacker et al., 2006)***.

3. The use of *electronic fetal monitoring (EFM)* is widespread. This technique is associated with an increased cesarean delivery rate compared with intermittent fetal heart rate auscultation**.** Although cesarean delivery performed primarily for "fetal distress" comprises only a minority of all such procedures, in many more cases, concern for an abnormal or "non reassuring" fetal heart rate tracing lowers the threshold for cesarean deliveries performed for abnormal progress of labor ***(Neilson et al.,2008).***

4. Most fetuses presenting as breech are now delivered by cesarean ***(Vendittelli et al., 2008).***

5. The incidence of forceps and vacuum deliveries has decreased ***(Martin et al., 2009).***

6. Rates of labor induction continue to rise, and induced labor, especially among nulliparous, increases the risk of cesarean delivery. According to the National Center for Health Statistics, the incidence of labor induction in the United States more than doubled from 9.5 percent in 1991 to 22.5 percent in 2006 ***(Martin et al., 2009).***

7. The prevalence of obesity has risen dramatically, and obesity increases the risk of cesarean delivery ***(Weiss et al., 2004).***

8. Rates of cesarean delivery for women with preeclampsia have increased, whereas rates of labor induction in these patients have declined. In Norway, for example, cesarean delivery for nulliparous with preeclampsia increased from 16.4 percent during 1967‑1978, to 35.4 percent during 1979‑1990, and to 37 percent during 1991‑2003 ***(Basso et al., 2006).***

9. *Vaginal birth after cesarean −VBAC−* has decreased from a high of 26 percent in 1996 to a rate of 8.5 percent in 2007 ***(Hamilton et al., 2009).***

10. Elective cesarean deliveries are increasingly being performed for a variety of indications including concern for *pelvic floor injury* associated with vaginal birth, medically indicated *preterm birth*, to reduce the risk of *fetal injury*, and for *patient request* ***(Ananth et al.,2005 and Nygaard and Cruikshank, 2003).***

11. *Malpractice litigation* continues to contribute significantly to the present cesarean rate. In a compilation of medical malpractice claim data for the years 1985 through 2003,

obstetrics accounted for the largest number of claims paid ***(Texas Medical Liability Trust, 2004).***

A brain damaged infant was one of the most prevalent patient conditions, and overall, the average indemnity paid on obstetrical claims was 28 percent greater than for the other 24 specialties included in the report. This data is especially troubling in view of the well-documented lack of association between cesarean delivery and any reduction in childhood neurological problems ***(Foley et al., 2002).***

Cesarean Delivery Related Maternal Mortality and Morbidity

Maternal death attributable solely to cesarean delivery is rare, even so, large data sets attest to the mortality risks. In a review of nearly 1.5 million pregnancies, maternal mortality rate was 2.2 per 100,000 cesarean deliveries ***(Clark el al., 2008).***

In another study, data from more than 2 million births in the United Kingdom from 1994 through 1996 proved that whereas emergency cesarean delivery was associated with an almost nine fold risk of maternal death compared with that of vaginal delivery, even elective cesarean delivery was associated with an almost three fold risk ***(Hall and Bewley, 1999).***

Rates of severe obstetrical complications increased in the U.S.A. from 1998‑1999 to 2004‑2005. Many of these increases were associated with the rising cesarean delivery rate ***(Kuklina et al., 2009).***

The maternal morbidity rate is increased twofold with cesarean delivery compared with vaginal delivery ***(Villar et al., 2007).*** Principal sources are puerperal infection, hemorrhage, and thromboembolism ***(Burrows et al., 2004).***

Re-hospitalization in the 30 days following cesarean delivery was more than twice as common as after vaginal delivery (75 versus 19 hospitalizations per 1000 deliveries) ***(Declerq et al., 2007).***

The incidence of bladder laceration with cesarean operation was 1.4 per 1000 procedures, and the incidence of ureteral injury was 0.3 per 1000**.** Although bladder injury was immediately identified, the diagnosis of ureteral injury often was delayed. Uterine infection is relatively common after cesarean delivery. Women with prior cesarean delivery have increased rates of uterine rupture in subsequent pregnancy compared with those with only prior vaginal deliveries **(*Rajasekar and Hall 1997).*** Fortunately, however, the risk of rupture is low, and the overall risk was found to approximate 0.3% ***(Spong et al., 2007).*** Morbidity associated with cesarean

delivery is increased dramatically in obese women. All of these morbidities, as well as the increased recovery time, result in a twofold increase in costs for cesarean versus vaginal delivery ***(Henderson et al., 2001).***

Patient Choice in Cesarean Delivery

As cesarean delivery has become safer and more commonly performed, and women have taken a more active role in their obstetrical care, it has been argued that women should be able to choose to undergo elective cesarean delivery ***(Harer et al., 2000).***

This has become one of the most important and controversial issues currently facing our specialty. Although the rate is difficult to determine with precision, elective cesarean delivery is on the rise and by one estimate, has increased 50 percent in the past decade ***(Meikle et al., 2005).***

Tow and half percent of all births in the United States in 2003 were defined as cesarean delivery on maternal request (CDMR). Reasons for mothers to request cesarean delivery include avoidance of pelvic floor injury during vaginal birth, reduced risk of fetal injury, avoidance of the uncertainty and pain of labor, and convenience ***(Gossman et al., 2006)***.

Approximately one third of the pregnant women who delivered at their institution entered spontaneous labor at term, and 96 percent of these delivered vaginally without adverse neonatal outcomes. Thus, the debate surrounding CDMR includes its medical rationale from both a maternal and fetal-neonatal standpoint, the concept of informed free choice by the woman, and the autonomy of the physicians in offering this choice ***(Worley et al., 2009)***.

The National Institute of Health held a scientific conference on Cesarean Delivery on Maternal Request. A panel of experts critically reviewed available literature to form recommendations based on risks and benefits identified. It is noteworthy that most of the maternal and neonatal outcomes examined had insufficient data to permit such recommendations. Indeed, one of the main conclusions of the conference was that more high-quality research is needed to fully evaluate the issues. This was also the conclusion of the American College of Obstetricians and Gynecologists ***(American College of Obstetricians and Gynecologists, 2007).***

Cesarean delivery on maternal request should not be performed prior to 39 weeks' gestation unless there is evidence of fetal lung maturity. It should be avoided in women desiring several children because of the risk of placenta accreta. Finally,