INTRODUCTION

Between 1970 and 2007, the rate of cesarean delivery rate in the United States increased dramatically from 5% to more than 31% ***(Hamilton et al., 2009).***

Recommendations favoring trial of labour after cesarean section (TOLAC) was reflected in increased vaginal birth after cesarean delivery (VBAC) rates (VBAC per 100 women with a prior cesarean delivery) from 5% in 1985 to 28.3 in 1996.The overall cesarean delivery rate decreased to approximately 20% by 1996 ***(Menacker et al., 2006) .***

Induction of labor in women with one previous cesarean section does not increase the risk of cesarean section rate and does not adversely affect immediate neonatal outcome. When there is no absolute indication for repeated cesarean section, induction of labor may be considered ***(Abdel karim Alsayegh et al., 2007).***

In women with one previous Cesarean section, induction of labor with prostaglandin leads to comparable rate of vaginal delivery similar to those without prior Cesarean section but with relatively high risk of uterine rupture ***(Al Qahtani et al., 2011).***

Trial of labour after previous cesarean section is associated with a successful rate of 73%, and the incidence of

maternal morbidity is similar in women experiencing a trial of labour and women choosing elective repeated cesarean section ***(Rossi and D'Addario ., 2008).***

The Royal College of Obstetricians and Gynecologists encourages the use of prostaglandins in preference to oxytocin for induction of labour in general, and although they also emphasises the need for careful consideration for the indications and the woman's wishes, they state that in the case of trial of labour in women with prior Cesarean delivery 'vaginal prostaglandins appear to be safe ***(McDonagh et al., 2005).***

In the study of ***Delaney et al. (2003)*****,** the risk of uterine rupture did not differ between groups with prostaglandins induction, oxcytocin induction, and with spontaneous labor respectively.

In the study of ***Chilaka et al. (2004)*** concordant results: no cases of uterine rupture were detected in women with successful versus failed induction after previous cesarean surgery, suggesting that induction of labor can be performed safely in women who are VBAC candidates. Trial of scar after previous caesarean delivery is safe for patients who are managed in tertiary care centers and in those hospitals where intensive surveillance, expertise and facilities for emergency caesarean section and exploratory laparotomies are available ***(Islam et al., 2011)*****.**

AIM OF THE WORK

To study the pregnancy outcome with induction of labor with prostaglandin E2 (PGE2) in women with one previous lower segment cesarean section.

CESAREAN SECTION

A.History

J.H.young in his monograph of "The history of cesarean section" puplished in 1944 reached a conclusion that " it is quite impossible to ascertain exactly when the opretion of cesarean section was first performed, whether on a living woman or post-mortem.There is no doubt however, that history of cesarean section is of great antiquity*".*

From the Oxford English Dictionary, the etymology of caesarean section derives from the Roman legal code, the lex Caesare ***(Simpson and Weiner, 1989).***

This law had its origins as the *lex Regia* from the eighth century bc and prescribed that a baby should be cut from its mother's womb if she dies before giving birth ***(Wolff, 1951)***.

The story of Julius Caesar's birth comes from Pliny the Elder, who wrote extensively on medical matters including childbirth ***(Health, 1991)***.

As for the origin of the term "cesarean section" several explanations have been suggested. It has been widely believed that the name of the operation is derived from a Roman Law, supposedly created by –Numa Pompilius (2^{nd} king of Rome, 715-761 B.C.), known as the Lex Regia, by which it was forbidden to bury a pregnant woman before the child had been

cut out. Later in the time of the Caesars, the law became the Lex Caesarea, and this is the most probable derivation of its present name ***(Cunningham et al., 2001).***

Much of his writing is from the perspective of traditional folklore practice in an agrarian age. Caesar's mother Aurelia survived childbirth and outlived her son to bury him 55 years later. The fact that she lived and gave birth successfully rules out the possibility that Caesar was born in this way .In Jewish literature, Maimonides records that it was well known in Rome how to perform this operation without killing the mother, but that it was seldom performed ***(Rosner, 1984)***.

Although the ancient writers suggest that it was undertaken in live mothers presumably for difficult births, the complications of haemorrhage and infection make it most unlikely that the woman could survive. There is no mention of the procedure in Soranus *Gynaecology* , the most eminent surviving text on midwifery nor from the writings of Hippocrates which contains sections on difficult births ***(Temkin, 1956).***

A single reference by Galen refers to the procedure '... the way in which the abdomen of the pregnant woman must be cut open and the child helped out while it is still fixed to the uterus, is not of our invention but has been described by many of the early authors ***(Todman, 2007).***

In 1316, Robert II of Scotland was born by caesarean section and his mother Marjorie Bruce died. This event may have been the inspiration for Macduff in Shakespeare's *Macbeth* . In the play, Macbeth hears a prophecy that 'none of woman born shall harm Macbeth', which is at first reassuring but then he discovers that Macduff was 'from his mother's womb untimely ripp'd', theproduct of caesarean section reminiscent of the birth of Robert II of Scotland ***(William, 1981).***

Though the earliest medical writers are silent on the subject of cesarean section, yet unmistakable references are made to it in ancient Rabbinical writings such as the Mischnagoth (140 B.C.) and the Talmud, compiled between the second and sixth centuries AD. If cesarean section was actually employed, it is particularly surprising that Soranus, whose extensive work written in the second century AD covered all aspects of obstetrics ,did not refer to cesarean section ***(Cunningham et al., 2001*)**.

There are sporadic reports of historical figures born by caesarean section. Raymond Nonnatus (1204–1240), the Catalan saint, was given his surname from the Latin*non- natus* (not born) because he was born in this manner. His mother died in childbirth ***(Hallam, 1994)***.

Another explanation is that according to legend, Julius Caesar was born in this manner, with the result that the

procedure became known as the " Cesarean operation". Several circumstances however weaken this explanation. Firstly the mother of Julius Caesar lived for many years after his birth in 100 B.C., and as late as the 17th century, the operation was almost invariably fatal. Secondly, the operation whether performed on the living or dead, is not mentioned by any medical writer before the middle ages ***(Cunningham et al., 2001).***

A linguistic explanation states that the word cesarean was derived sometime in the middle ages from the Latin verb Caedera, "to cut". An obvious cognate is the word caesura, a cutting, or pause, in a line of verse. This explanation of the term cesarean 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 ***(Cunningham et al., 2001).***

Cesarean section on the living was first recommended, and the current name of the operation used, in the collaborated work of Francois Rousset (1581) entitled "Traite Nouveau de 1'hysterotomotokie ou 1'enfantement cesarien ".Rousset had never performed or witnessed the operation; his information was based chiefly on letters from friends. He reported 14 successful cesarean sections, a fact itself difficult to accept. When it is further

stated that 6 of the 14 operations were performed on the same woman, the credulity of the most gullible is exhausted ***(Cunningham et al., 2001).***

The first recorded case of a mother and a baby surviving caesarean section was in 1500 in Siegersausen, Switzerland, where Jacob Nufer, a pig gelder, reportedly performed the operation on his wife after a prolonged labour. She spent several days in labour and had assistance from 13 midwives but was still unable to deliver her baby. Her husband received permission from the religious authorities to perform a caesarean section. Miraculously, the mother lived and subsequently gave birth to five other children by vaginal deliveries including twins. The baby lived to the age of 77 years. Historians question the accuracy of the story considering it was not reported until 82 years after the event. It is also possible that this was an extra-uterine abdominal delivery, as it seems unlikely that she could have so many subsequent vaginal deliveries without rupture ***(Trolle, 1982 and Reiss, 2003).***

The techniques of caesarean section were largely unchanged until the 1870s. It was generally believed that suturing the uterine wall was not necessary. Fleetwood Churchill, a British obstetrician, recorded in 1872 ‘no sutures are required in the uterus; as it contracts, the wound will be reduced to 1–2 inches and the lips will come into opposition, if it be healthy ***(Churchill, 1872).***

Although the introduction of uterine sutures reduced the mortality rate of the operation from haemorrhage, generalised peritonitis remained the dominant cause of death; hence, various types of operations were derived to combat this scourge ***(Cunningham et al., 2001)*.**

Walter Balls-Headley in 1888 performed the first operation at the Women's Hospital in Melbourne using the Porro technique ***(Forster, 1970).***

Harris in ***(1881)*** reviewed the world literature and found 50 cases delivered by the Porro method showing a maternal mortality of 58% and a fetal survival of 86%.

In 1925, Munro Kerr of Glasgow modified Kronig's technique and performed a downward curving transverse incision on the lower uterine segment ***(Kerr, 1926).***

Craigin's famous dictum 'once a caesarean, always a caesarean' first appeared in his paper in a New York medical journal in 1916 ***(Craigin, 1916)*.**

As recently as 2000, the Australian vaginal birth after caesarean section (VBAC) study group found that only one quarter of women with a previous caesarean scar had a vaginal delivery ***(Appleton et al., 2000).***

This is despite the known low risk of uterine rupture in VBACs. As noted by Robson and de costa, the issue of

offering a trial vaginal delivery after a previous caesarean section '... illustrates beautifully the essential tension between evidence-based practice and patient choice and autonomy ***(Robson and de Costa, 2004).***

B. Epidemiology and Rates:

There has been an increase in cesarean section rate over the past 20 years , which is not uniform but associated with wide variations between and within countries ***(Sachs et al., 1999).***

This is not a recent phenomenon ,a senior obstetrician in 1922 wrote to the British Medical Journal: "The art and science of midwifery have either been lost by the younger generation in this country or will certainly be lost if this mad rage for cesarean section is continued" ***(Chamberlain et al., 2001).***

The rate of cesarean section for many years remained relatively stable at 3-5%. This started to change in 1960s. In 1965,cesarean section rate was 8.5 % of all deliveries then increased dramatically from 1960 to 1988 to reach 16.5 % in 1980 and 25 % in 1988 ***(Taffel et al .,1991)***

From 1998 to 2008 the CS rate in New South Wales increased from 19.1 to 29.5 per 100 births, giving an overall rate of 25.4 per 100 births. This CS rate is similar to rates reported elsewhere in Australia which range from 28.0 in Tasmania to 33.1 in Queensland (Laws and Sullivan2009).

When compared to caesarean rates around the world, this CS rate is higher than Norway (13.9) ***(Kolas et al., 2003)***, similar to Asian countries (27.3) but lower than that reported in the USA (31.1) ***(MacDorman et al., 2008)***.

The percentage of all births in the United States that are cesarean deliveries has increased substantially in recent years, from 20.7% in 1996 to an all-time high of 31.1% in 2006 ***(Hamilton et al., 2007).***

The primary cesarean rate increased from 14.6% in1996 to 20.6% in 2004. Sixty percent of the increase in the total cesarean rate from 1996 to 2004 was the result of increases in primary cesareans. At the same time, the VBAC rate decreased from 28.3% to 9.2%. A decrease in the VBAC rate implies a corresponding increase in the repeat cesarean rate, which reached almost 91% in 2004 ***(Martin et al., 2006).***

Table 1: Cesarean section rates & selective indications in the USA in 1980-1988.

Indications	1980		1988	
	Rate	%	Rate	%
1) Repeat C.S	4.9	30	9.0	36
2) Dystocia	4.8	29	7.6	31
3) Foetal distress	0.8	5	2.3	9
4) Breech	2.0	12	2.5	10
5) Other indication	4.0	24	3.3	14
Total	16.5		24.7	

(Taffel et al., 1991).

Most of this increase took place in the 1970s and early 1980s and occurred throughout the western world ***(Belizan et al., 1999***)

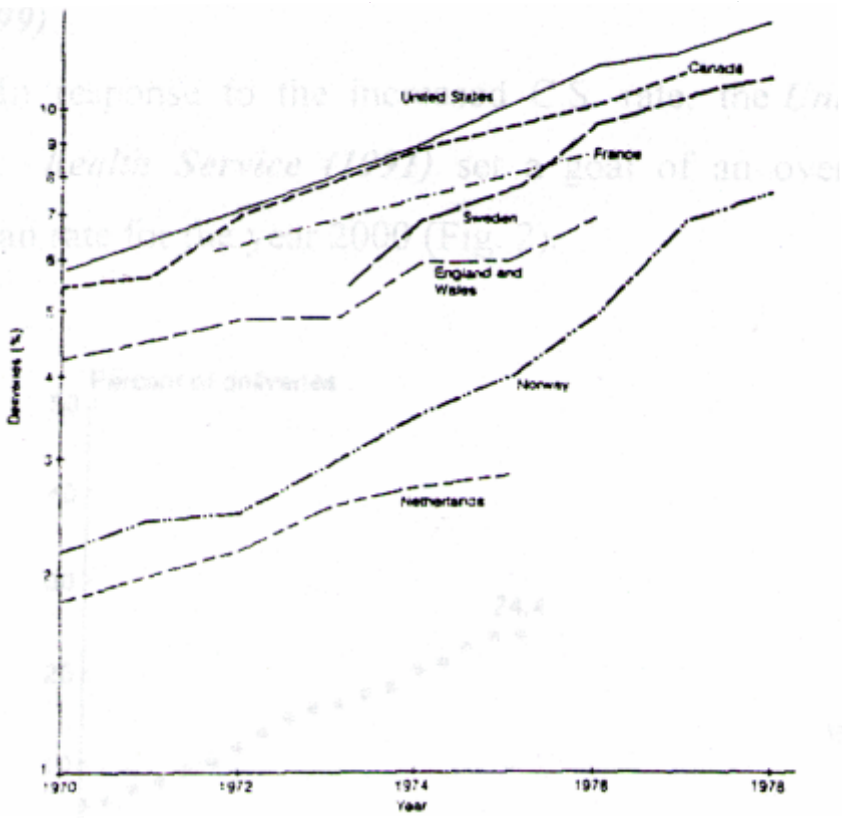

Figure 1: Percentage of cesarean deliveries :Selected countries 1970-1978 ***(Smith, 1987).***

Reasons for quadrupling of the cesarean rate between 1965 and 1988 are not completely understood but some explanations ***include the following*** : -

1. There is reduced parity, and almost half of pregnant women are nulliparas. Therefore an increased number of cesarean births might be expected for conditions that are more common in nulliparous women ***(Parrish et al., 1989)***.

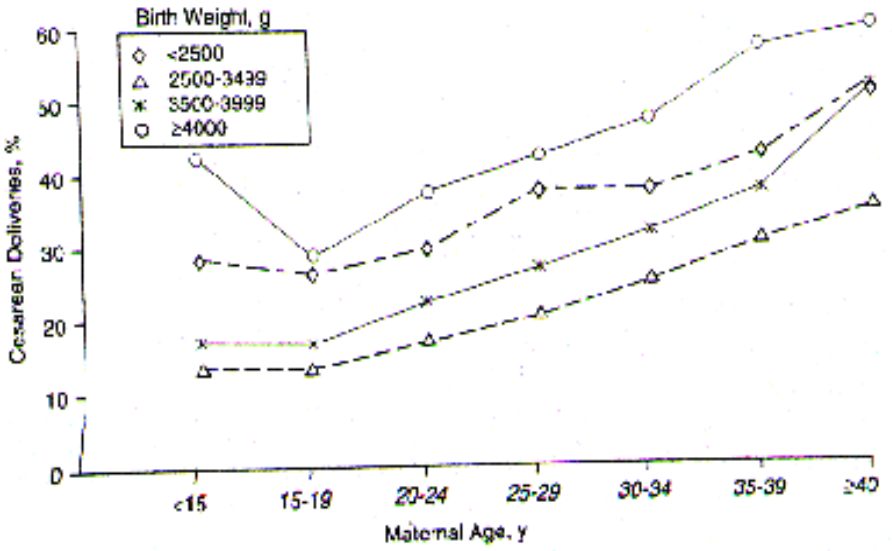

Figure 2: Primary cesarean deliveries by maternal age and birth weight among nulliparous women in Washington state 1987 –1990 ***(Parrish et al., 1989.)***

2- Older women are having children. The frequency of cesarean deliveries increases with advancing age .In the past two decades, the rate of nulliparous births more than doubled for women aged 30 to 39 and increased by 50 percent in women 40 to 44 years old ***(Peipert and Bracken, 1993).***

3- By 1990, 83 percent of all breech presentations were delivered abdominally ***(Notzon et al., 1994).***

4- The incidence of midpelvic vaginal deliveries has decreased. Indeed, according to ***the American College of Obstetricians and Gynecologists (1994)***, operative vaginal deliveries performed at stations higher than +2 should be performed only in rare emergencies and with simultaneous preparation for cesarean delivery ***(Cunningham et al., 2001***).

5- Concern for malpractice litigation has contributed significantly to the present cesarean delivery rate. Failure to perform a cesarean and thus avoid adverse neonatal neurological outcome or cerebral palsy is the dominant claim in obstetrical malpractice litigation in the United States ***(Cunningham et al., 2001)***.

Currently patients with previous cesarean section represent a relatively large proportion of the obstetric population in the USA (10-15%) , the majority of these will have had one previous cesarean section ,15% will have undergone two previous cesarean deliveries and 5% will have undergone three or more cesarean deliveries and no other single indication exceeds that of previous section as an indication for repeat surgery***(Wing et al., 1998).***

In reponse to the increased cesarean section rate, ***the United States Health Service (1991)*** set a goal of an overall 15% cesarean section rate for the year 2000 (fig. 3).

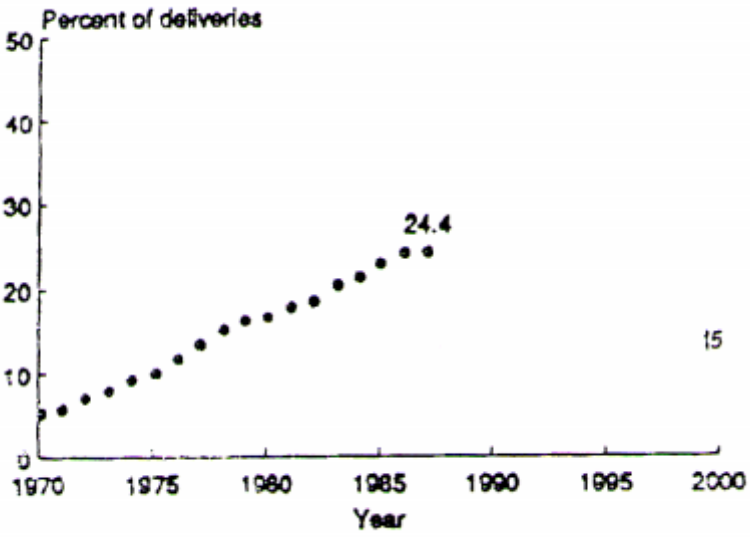

Figure 3: United states Public Health Service (1991) goal for the overall rate of cesarean delivery in the year 2000

Since 1988 , the frequency of cesarean section appears to have reached a plateau ; a 22.7% cesarean section rate was seen in 1990 and 23.5 % rate in 1991 ***(National Hospital Discharge Survey, 1991).***

Between 1989 and 1998, the rate of cesarean delivery decreased in the united states mostly due to increased VBAC rate and to a lesser extent to a decrease in the primary cesarean rate. ***(Ventura et al., 2000)*** .