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**Patients and obstetricians attitudes associated with
caesarean section on maternal request**

Diploma thesis

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Written Declaration

I declare that I completed the submitted work individually and only used the mentioned sources and literature. Concurrently, I give my permission for this diploma/bachelor thesis to be used for study purposes.

In Prague on March 2010

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1.INTRODUCTION:

A woman's right to choose to deliver by elective cesarean section has been a big topic in both the scientific arena and the lay press. Over the last twenty years we have seen a steady increase of cesarean section rates in the developed part of the world, both elective and emergency sections. (see fig. 1) The concern rose in the 1970's and this led to the first National Institutes of Health Consensus Conference. The conclusion was that the cesarean rate should be stabilized and possibly reduced. During the 1980's one could see that these optimistic expectations had failed. (141)

In this paper I will look at the different factors that have led to the rising trend of cesarean sections on maternal request and cesarean sections in total. This is a complicated topic, and as there is little research done on cesarean sections on request alone one has to look at the data that exist, and those are for cesarean section in total (both elective and emergency.) As this has become a topic in the scientific arena, there is now an increasing interest to do more research on the topic.

There are many factors which can be seen as essential to the growing rate of elective cesarean sections, the most crucial of these will be presented in this paper. Firstly, the increasing safety of the procedure can be seen as an influencing factor. Secondly, the decreasing trend of paternalistic medicine, where a patient must be heard and give his/her consent to all medical treatment. This has led to a debate around the question: should a patient have the right to choose her own mode of delivery? Should the physician's opinion about the decision matter? In obstetrics an elective cesarean section in a uncomplicated pregnancy, has traditionally been considered inappropriate and any request for such a procedure would be refused.(142) However the view that this procedure is clinically unjustifiable has been challenged.(143) The balance of benefit and harm between cesarean section and vaginal delivery is crucial to this debate, even though evidence is incomplete, it challenges the dogma that vaginal delivery is always better than a cesarean section would be. One of the core questions is whether a physician should perform a cesarean section based on maternal request in the absence of any standard medical indications for the procedure. The answer to this question lies largely in the data about the comparative safety of planned cesarean and vaginal births, these data has been developing quickly over the past few years.

We are at a turning point in obstetric thinking, we have the advances of making cesarean section safe and the evidence that vaginal delivery also can be associated with morbidity. In addition the attitudes of society today, which reflects intolerance for risk. But is elective cesarean section really less risky than vaginal delivery?

We encourage "family planning", pre pregnancy counseling. We routinely perform antenatal screening, prenatal diagnosis, all of this quite unnatural, should we then be able to refuse a woman an "unnatural" mode of delivery?

The question of elective cesarean on maternal request raises a lot of medical, juridical, economic and ethical questions.

I choose to look at data from all over the world. As I am from Norway I will have some extra focus on data from Norway.

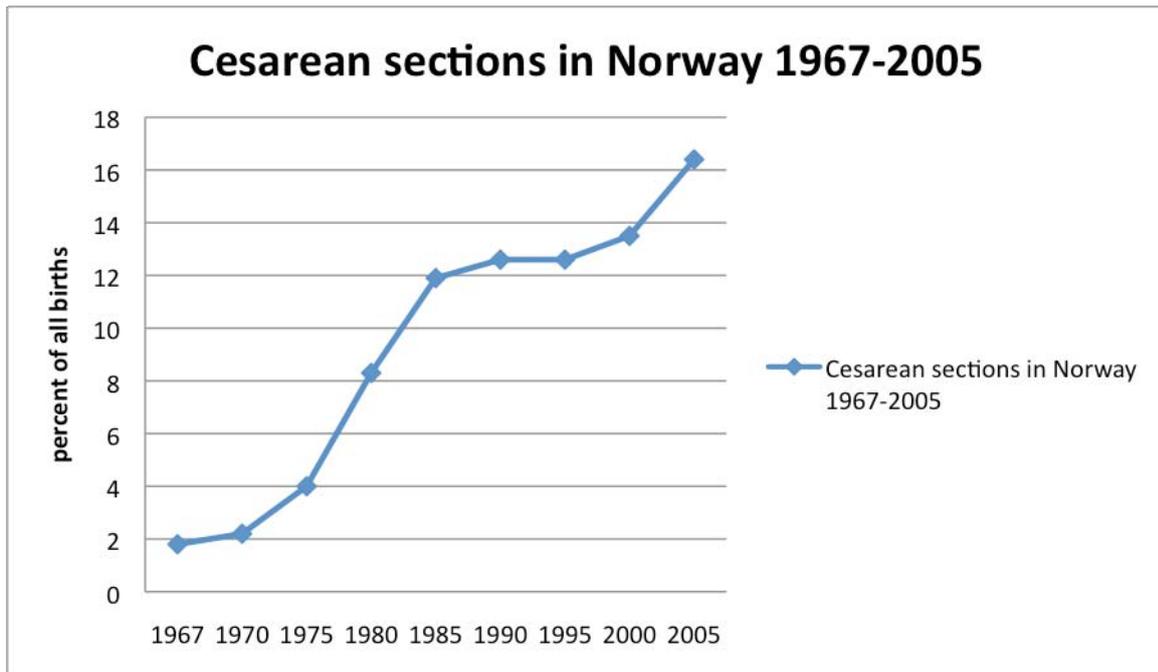


Fig.1: Cesarean sections in Norway 1967-2005, percent of all births. (152) Showing the rise of cesarean sections over the years in Norway. One will see similar charts in many other developed countries. Numbers from The medical birth registry of Norway.

2.What is as cesarean section:

A Cesarean section is defined as the delivery of a fetus through a surgical incision through the abdominal wall (laparotomy) and uterine wall (hysterectomy). The words cesarean and section are both derived from verbs that mean to cut. (Caedere- to cut, sectio) Cesarean section has become one of the most commonly performed operations at most hospitals. Yearly there are over 9000 cesarean sections in Norway (2003-2004). 1 of 6 babies (16%) are delivered this way. Of all the cesarean sections performed 7, 6% were because of maternal request. Most of the cesarean sections performed are emergency C-sections either because of the mother or the baby. The leading indications for caesarian sections worldwide are previous cesarean delivery, breech presentation, shoulder dystocia, and fetal distress. In Norway however fetal distress, closely followed by slow progress of labor are the most common The chart below is from a study performed by the Norwegian Institute of public health, in the first half of 1999 that shows the most frequent reasons for cesarean section. The study included 70 percent of all caesarean sections in Norway at that period.

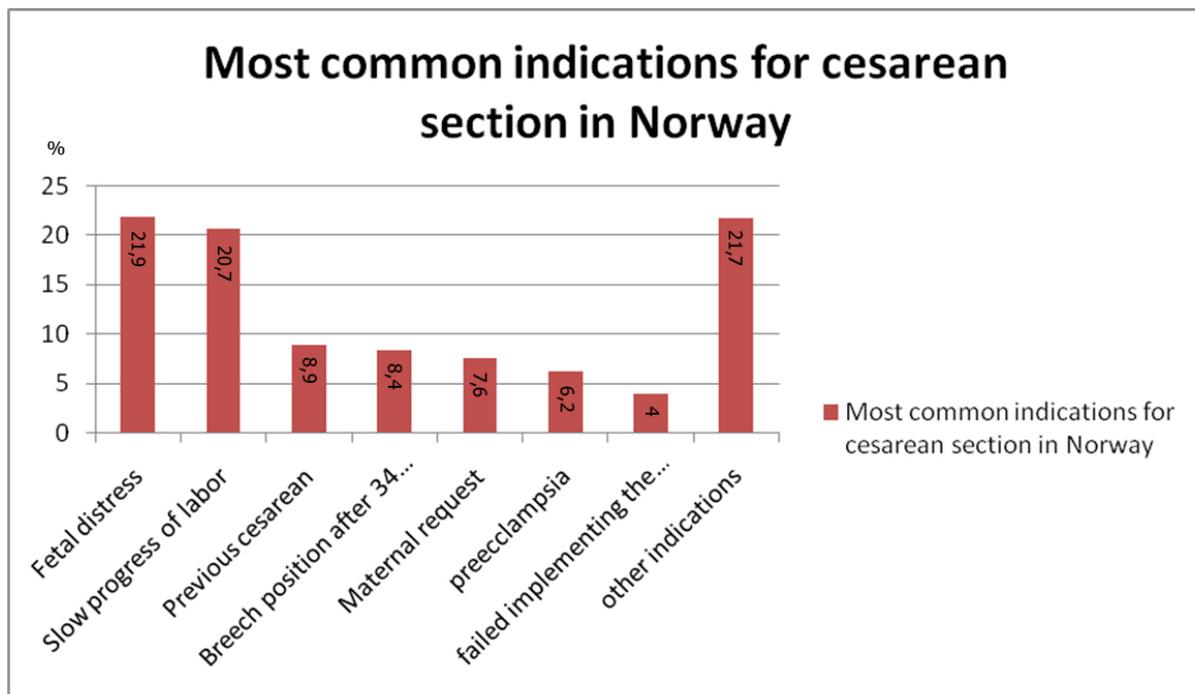


Fig.2 Indications for cesarean sections in Norway in 1999. Modified chart, data collected from Norwegian Institute of public health (NIPH). NIPH is the Norwegian governmental research institute of public health and the main adviser to the Ministry of Health in this field. (153)

There are relatively few contra indications for having a cesarean section performed. If the fetus is alive and viable gestational age, a cesarean delivery can be performed. However, in some instances, a cesarean delivery should be avoided as the maternal status may be compromised (eg, with severe pulmonary disease), as an operation may jeopardize the maternal survival. In such difficult situations, a care plan should be outlined in case of medical intervention is needed. Additionally, a cesarean delivery may not be recommended if the fetus has a known karyotypic abnormality (trisomy 13 or 18) or known congenital anomaly that may lead to death (anencephaly).

There are different reasons for having a cesarean section, as mentioned before emergency C-sections are the most common type of cesarean section, but various types exist:

- A planned elective cesarean for no medical indication is where one performs a cesarean on a healthy full term women at her own request.
- Planned cesarean section for medical indication (for example diabetes)
- Planned repeat cesarean section (no labor)
- Emergency cesarean in labor
- Cesarean section performed for labor disorder

The cesarean delivery has evolved from a last attempt performed to save the fetus to one in which physician and patient both participate in the decision-making process, trying to make a decision that will be the best for mother and child.

3. History of the Procedure:

The safety of the procedure has had a big impact on the rising rates of cesarean section. To understand how this has evolved it is interesting to look at the history of the procedure itself and how it has evolved through time.

Cesarean section has been part of human culture since ancient times and there are tales in both Western and non-Western cultures of this procedure resulting in live mothers and offspring. According to Greek mythology Apollo removed Asclepius, founder of the famous cult of religious medicine, from his mother's abdomen. Numerous references to cesarean section appear in ancient Hindu, Egyptian, Grecian, Roman, and other European folklore.

One thinks that the name cesarean section derives from the Roman legal code; *Lex Caesare*. This law originated as the *Lex Regia* from the eighth century BC and mandated a postmortem operative delivery so that both the mother and child could be buried separately. Children who were delivered this way were called *Caesones*. It is commonly believed that Julius Cesar was delivered from his mother Aurelia this way, but it is unlikely since she lived to hear about his invasions later in life.

Ancient writers, such as Pliny, the elder and Maimonides, describes cesarean sections were performed on living mothers in case of difficult births. But complications at that time would make it doubtful that the mother could have survived.

The first recorded case of a surviving mother and infant pair was in 1500 in Switzerland, where a pig gelder performed a cesarean delivery on his wife after obtaining permission from the local authorities. The mother lived on to give birth to five children after. The story was recorded 82 years after, so there is some doubt around the story.

In the sixteenth and seventeenth century there are more reports by obstetricians about this operation. The medical education was improving in the era of the renaissance, numerous works illustrated the human anatomy in detail, Andreas Vesalius' publication on human anatomy in 1543 (*De Corporis Humani Fabrica*). In the eighteenth and nineteenth centuries anatomists and surgeons expanded their knowledge by having more access to human cadavers.

The ability of obstetricians to perform the procedure was limited by anesthesia. In 1846 at the Massachusetts General Hospital, William Morton, a dentist successfully removed a facial tumor from a patient using ether. In 1847 in Edinburgh, James Young Simpson experimented on himself with chloroform and induced a state of unconsciousness. There was initially a opposition towards using anesthetics in childbirth, because the women were supposed to “sorrow to bring forth children in atonement for Eve’s sin” this was taken away in England when Queen Victoria used chloroform for the births of her two children. It then became popular among wealthy to choose cesarean sections.

Surgical technique was also a limiting factor for the acceptability of the procedure. Initially, maternal mortality from blood loss was high because surgeons were reluctant to close the uterine incision. They thought that internal stitching would increase the danger of infection, and that the uterus would close permanently. In 1876, the Italian professor Eduardo Porro advocated hysterectomy at the time of cesarean delivery to control bleeding and decrease infection. Maternal mortality was approximately 60% and fetal survival was around 85%. The first successful cesarean hysterectomy in the United States was performed by Richardson in 1881. In 1882, a German obstetrician, Max Saumlinger, described the value of suturing the uterine wall with silver wire and silk in a 2-step closure. These sutures were a new material developed in the United States by J. Marion Sims who had advocated the silver wire sutures to treat vaginal tears or fistulas from traumatic childbirth. This was a significant advancement as removal of the suture material was no longer required.

Although the use of internal sutures decreased hemorrhagic morbidity, infectious morbidity from peritonitis remained substantial. Major advances in asepsis began with the introduction of hand washing by Semmelweis in 1847 at the Vienna Maternity Hospital. Subsequently Joseph Lister introduced carbolic spray in the operating theater in 1867. These 2 interventions together with not using the cesarean delivery as a measure of last resort and after extensive intrauterine instrumentation (high forceps, craniotomy), led to a substantial reduction in infectious morbidity and mortality. Maternal mortality dropped from 65% at the beginning of the 19th century to 5-10% at the end.

In 1907, the extra peritoneal approach was first described by Frank and modified in 1909 by Latzko. This approach appeared to decrease the risk of peritonitis, and, in 1912, Krönig described that this approach also allowed access to the thinner lower uterine segment. Krönig described a vertical median uterine incision with delivery aided by forceps. Then, the lower segment was covered with peritoneum.

This technique was modified further and introduced in the United States by Beck (1919) and DeLee (1922). Finally, in 1926, Kerr described a low transverse incision in the lower uterine segment, which did not become widely used until the 1940s and is today the most commonly used uterine incision throughout the world. With the discovery of penicillin by Alexander Fleming in 1928 (purified in 1940), the need for an extra peritoneal procedure was essentially eliminated.

Rickets was a common indication for cesarean section because the women’s pelvis was malformed and normal delivery was difficult. This changed after the 1930’s when safe milk became available. But even though Rickets declined cesarean sections did not.

Since 1940, the trend toward medically managed pregnancy and childbirth has steadily accelerated. Many new hospitals were built in which women gave birth and in where

obstetrical operations were performed. By 1938, approximately half of U.S. births were taking place in hospitals. By 1955, this had risen to ninety-nine percent.

Advances in anesthesia contributed to improving the safety and the experience of cesarean section. In numerous countries, including the United States, spinal or epidural anesthesia is used to alleviate pain in normal childbirth. It has also largely replaced general anesthesia in cesarean deliveries, permitting women to remain conscious during surgery. It results in better outcomes for mothers and babies and facilitates immediate contact and bonding to occur.

As this brief history suggests, the indications for cesarean section have varied tremendously through our documented history. They have been shaped by religious, cultural, economic, professional, and technological developments -- all of which have impinged on medical practice. The operation originated from attempts to save the soul, if not the life, of a fetus whose mother was dead or dying. Since ancient times, however, there have been occasional efforts to save the mother, and during the nineteenth century, systematic improvement of cesarean section techniques eventually led to lower mortality for women and their fetuses. Increasingly the operation was performed in cases where the mother's health was considered endangered, in addition to those in which her life was immediately at stake. Finally, in the late twentieth century, in mainstream Western medical society the fetus has become the primary patient once labor has commenced. As a result, we have seen in the last 30 years a marked increase in resort to surgery on the basis of fetal health indications.

While there is sound reason to believe that cesarean section has been employed too frequently in some societies during the last two or three decades, the operation clearly changes the outcome favorably for a significant percentage of women and babies. In our society now women may be afraid of the pain of childbirth, but they do not expect it to kill them. Such could not be said of many women as late as the nineteenth century. Moreover, most women now expect their babies to survive birth. These are modern assumptions and ones that cesarean section has helped to promulgate. An operation that virtually always resulted in a dead woman and dead fetus now almost always results in a living mother and baby -- a transformation as significant to the women and families involved as to the medical profession.

4. Rising rates of cesarean section:

As mentioned earlier in this paper there is a steady increase in cesarean sections worldwide in developed countries. This has a lot to do with the improvement of the procedure itself as explained in the history, and as the technology has improved, better equipment to monitor baby and mothers are available as cardiotocography and ultrasound. Because of this equipment we can now detect abnormalities that one could not see before, and intervene. For these reasons the rate of intervention (cesarean section) has increased. The age of first time pregnancies are generally older now than before. This is because they choose to have careers, and are usually more determined on their decisions (wanting a cesarean section/vaginal delivery). Simultaneously with their age increase medical complications as preeclampsia and diabetes increase, also contributing to the increasing number of cesarean sections. In 2000 there was an international study published, that it was better to do cesarean sections on breech positions after 37 week, this also will have influenced the increasing trend.(6)

We are talking about increasing rates, but the numbers differ from country to country and region to region, depending on what laws and what medical system they are using. The cesarean delivery rate is approximately 21.1% for the most developed regions of the globe,

14.3% for the less developed regions, and 2% for the least developed regions.(131) In the UK the rate of cesarean section is almost on the same level as USA and Canada with over 20%. In the United States the rates of cesarean sections rose quickly in the 1990's (1). Initiatives were taken to reduce the rate, USA had a goal to reduce their rates down to WHO's recommendation (15%) by 2000, but they did not succeed, as stated earlier it is around 20%. However the rate did decrease and has stabilized over time. One of the initiatives taken were introducing vaginal birth after previous cesarean section.(2) The rates in Latin America has been a concern the past years.(3) In Chile in 1997 40% of the births were by cesarean section with twice the rate in private hospitals.(4) A study in Brazil where women were interviewed about their preference of delivery mode, shows that 31% of the women in public sector, compared to 72% in the private sector, preferred a cesarean section(5). The study also found that 70-80% of all the women preferred vaginal delivery at the time of the antenatal interview, so the rising rates could not be explained by the women's choice alone, but that the physicians have a huge role in these numbers of preference as well. As most of the cesarean sections are done in the private sector, a cesarean section will mean greater profit for the physician and the clinic he works for.

An expert group in WHO meant in 1985 that 15% of all deliveries should be the upper limit of cesarean sections in a country. This number was based on the rates of cesarean sections in some countries with low perinatal mortality. A big discussion topic now in many countries is how one can reduce the growing rate of cesarean sections. This is a tricky question, especially now when the patient is supposed to have an influence in decision making. This means that both the patients and the doctor's attitudes has to change to reach a result.

5. Patient doctor relations (non-paternalism):

As recently mentioned, the patient's position in decision making today has had great effect on the rising trend of cesarean sections. We are in an era where the patient's right is in focus. The patient needs to consent to all procedures and medication. There is no exception in obstetrics. All decisions are made together with the patient as a kind of partnership. Therefore a pregnant woman can now choose to deliver by C-section in most places. In the UK, obstetricians were encouraged to involve women in decisions about their own care in the 1990's. (7) Similarly was done in Italy and USA.(8,9) 4 years after this decision, it was concluded that the services needed to become more consumer centered.(151) In Italy a woman's choice must now be respected by law in all cases.(145) In Norway the women has a right to make a decision together with a physician, but does not have the right to decide alone.(133-135) Women are more satisfied with surgical care if they feel involved in the decision making.(37) The importance of involving the woman in decisions should not be underestimated, whatever the final result regarding surgery.

This way of involving patients was introduced in the time when c-sections were on the rise with initiatives to try to reverse the trend. Therefore it has become somewhat of a dilemma. There has naturally been a rise in cesarean sections on maternal request. But equally, a woman has a right to refuse medically indicated intervention, including life saving cesarean section. This results in an ethical conflict between patient and physician. (31) There are cases where legal interventions have been made to save mother and baby, where they have refused cesarean section. The physician can also refuse to operate if there are no medical indications

for the procedure. A statement from the American college of obstetricians and gynecologists (ACOG) on "surgery and patient choice: The ethics on decision making" The committee opinion concluded that a physician have an ethical right to offer an elective cesarean if they believe that it will promote the overall health and welfare of the woman and fetus more than vaginal birth. Also it says that a physician has the right to refrain from performing the surgery if they believe it to be detrimental to the women and fetus. (38)

The clinician's role should be to provide the best evidence-based counseling possible to the woman, and to respect her autonomy and decision-making capabilities, when considering route of delivery. With this, she can make a balanced decision. It is important to understand that this decision is made for two individuals, the mother and baby.

Healthcare providers must be aware of the importance and consequences of decisions about mode of delivery, as neither method is without risk. Accepting maternal choice as the sole determinant of the method of delivery is probably doing the pregnant woman a disservice. The physician will be reduced to a mere technician, accommodating consumer demands, rather than a professional using their knowledge and experiences to make the appropriate treatment choices. Therefore it is important to make the decision together with the patient, not for them and not letting them dictate treatment either.

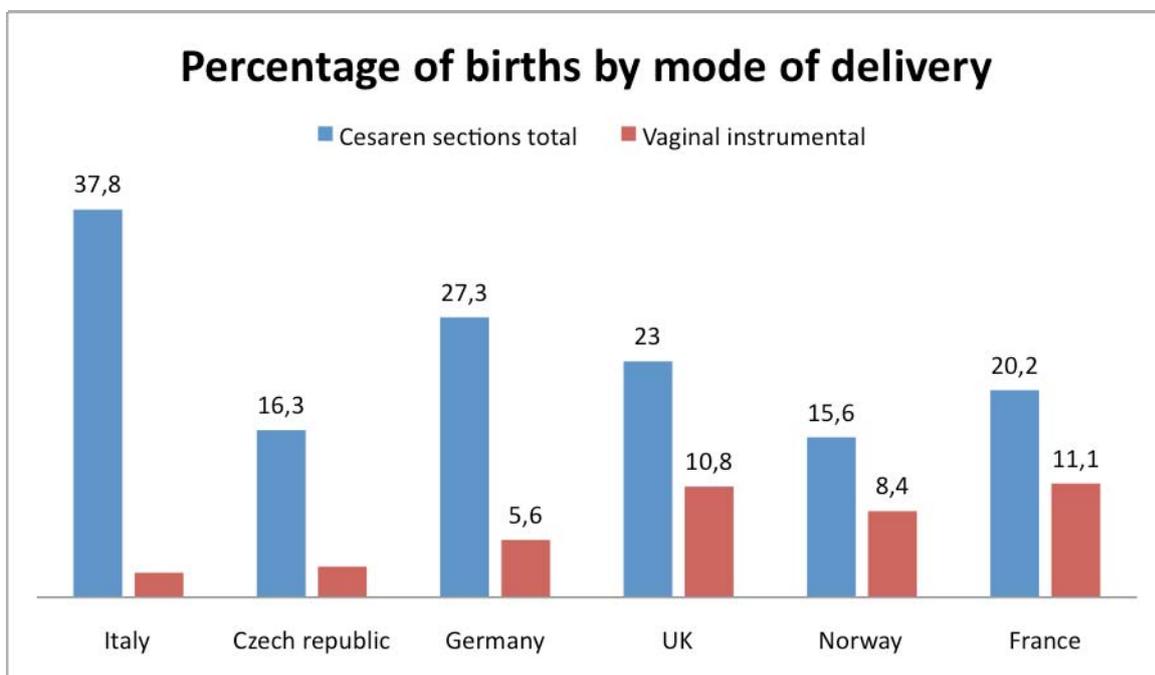


Fig.3 Modified chart showing in percent, mode of delivery in selected countries. Data from 2004 (39)

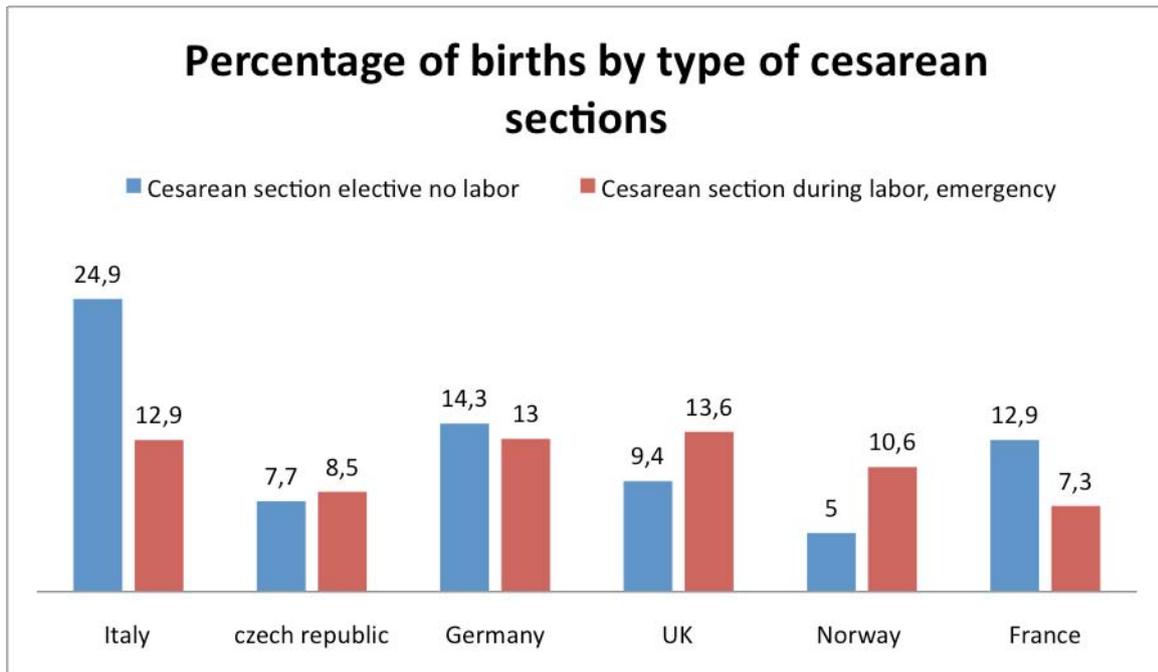


Fig.4 Modified chart showing percentage of births by type of cesarean section in selected countries. Data from 2004. (40)

6. Why do women want a c-section instead of vaginal birth?

6.1 Social factors: Modern human beings living in a developed part of the world is used to a predictable life. We are used to knowing when the bus comes, plane arrives, planned workdays. We are also used to buying whatever we want, when we want. Health is not this predictable. We are still not able to predict the exact date and time that labor will start. Therefore a planned c-section would remove this uncertainty. Women today also have careers, and many feel it is a waste of maternity leave if it is taken out before the child is born.

6.2 Peer group pressure: Experiences in Brazil suggests that cultural pressure is important. C-sections rates are as high as 80% in some private hospitals. C-section is considered as the optimal and vaginal delivery is old fashioned. (13) A survey of obstetrician's attitudes in UK showed that 30% of female obstetrician's would choose a cesarean section in a uncomplicated pregnancy.(14) High profile celebrities has earlier chosen cesarean sections, these people are often portrayed in the media right after delivery in revealing clothing, looking quite fit. Many people want to copy their idols, and choosing a cesarean section would be a natural thing to do. The trend is actually changing as there have been more celebrities giving birth vaginally. (12)

6.3 Pressure from obstetrician's: a survey done on recent mothers in 2006(119) showed that mothers with primary cesareans, indicated that it was not them but their obstetrician's that were the predominant decision makers when it came to the question about choosing a cesarean. 26% reported that they felt pressured into choosing it. Only 1 of 252 survey responders reported making the choice to schedule a cesarean in advance. 2 other in the survey reported that the decision to have a cesarean, with no medical indication, was made

fully by their obstetrician. As noted before Brazil has a high rate of cesarean section. The public opinion is that this is because of maternal request. But a survey done, shows that the majority of primiparous women want to deliver vaginally, but end up delivering surgically in hospital setting. (120,121)

6.4 Tokophobia: It is often true that one does not hear about births that went well, but we do get to hear about the ones who had complications, pain, bad staff etc. This is displayed in the media, hear it from colleagues or friends. Today pain is a feeling that is rarely tolerated, we do all we can to lower/abolish it. Pain is therefore a dreaded feeling. In some countries where there is little or no anesthesia available and maternal mortality is high, tokophobia is understandable.

But still with our modern equipment a small number of women experience morbid fear of labor and childbirth. Some are so afraid that they will never try to become pregnant. A woman who requests a planned cesarean section because of anxiety should be assessed and counseled by a psychiatrist/psychologist. If they support the diagnosis of tokophobia, then an elective C-section has a valid medical reason. A study of 26 women with tokophobia showed that there was a higher psychological morbidity (including poor bonding) if women were refused their choice of delivery in comparison to those who got to choose. (15) In many women, the opportunity to discuss their fears and to be reassured on the matters of pain relief was enough to change their minds and deliver vaginally. (16)

Secondary tokophobia may be result of a prior complicated, distressing delivery. It has been shown that voluntary infertility is higher in women who have had instrumental delivery and C-section than women who underwent normal delivery. (17)

A survey of the attitudes of 3061 women in early pregnancy, relatively few wanted a C-section, but those who wanted were more worried about birth and life in general. (18)

6.5 Avoiding fetal risk: Studies confirm that the risk of stillbirth calculated per 1000 ongoing pregnancies increases 6-fold from weeks 37-43 of gestation. (19) This argument has been used to promote elective cesarean section. C-section is also an alternative inducing labor in post term pregnancies. It is often suggested by doing a C-section you will avoid Cerebral palsy, stillbirth, fetal trauma like brachial plexus injuries.

Women commonly believe that elective cesarean section carries no risk to the baby. (28) Respiratory distress syndrome and transient tachypnoea of the newborn are increased after cesarean section and in particular in women who has not been in labor. (29)

6.6 Avoiding maternal risk: Elective cesarean section avoids the pain of labor, but experiences post operative surgical pain. Cesarean section carries risks as all operations, but an elective one is safer than an emergency cesarean, therefore if one plans one, one does not have to go through an emergency c-section.

One big fear is damage to the pelvic floor structures, leading to urinary and anal incontinence, most of the existing literature is based on observational studies and they suggest that there is an increase of pelvic floor damage by vaginal delivery, (20, 21) but when all data has been controlled for the types of vaginal birth and management of delivery, the noted incidence of this complications decreases and in some cases there is no differences between vaginal and cesarean births. (22-26) One thinks if a women has a normal spontaneous vaginal birth without use of instruments, and is not instructed to use forced early pushing, and is not given a episiotomy, her risks for serious damage to pelvic floor structures are minimal.(22) One large study showed that for older women, there is no differences in the evidence of incontinence postmenopausally in women who have had children and in women who had never been pregnant.(25) It is suggested that pelvic floor disorders following giving birth is connected to the state of being pregnant and not the mode of delivery itself. (27)

7. Why do a obstetrician want to do a elective cesarean section:

7.1 Medical attitude: As mentioned before, many female obstetricians would have an elective cesarean themselves. Another survey asking doctors that were willing to do cesareans when requested thought that the risk outweighed the benefits of cesarean. Few of them were willing to have a cesarean themselves or offer it to their partner. (123-125, 126) Doctors like to think that their decisions are made fully objectively. Truth is that personal opinions sometimes come out. (30) There are of course many different obstetricians. Some do really want to make a balanced decision together with their patient, but some choose the decision that would gain them. A paper from 2004 on intrapartum elective cesarean delivery (122) surveyed obstetricians. After all intrapartum cesarean deliveries in their facility they asked whether the cesarean section was offered by the obstetricians or requested by the mother before being medically indicated. Of 422 cases, cesarean was offered in 13% of cases before a clear medical indication emerged, and requested in 8,8%.Physicians characteristics and not the patient's characteristics were the significant factor in determining whether elective cesarean sections were offered.

7.2 Medico-legal: Fear of litigation, because of misinterpreting cardiotocography etc. has lead to an increase of cesarean sections.

7.3 Peer group pressure: Doctors are rarely criticized by their peers for unnecessary interventions, but are criticized when they feel it has been a lack of intervention even when the outcome is good, and especially when the outcome is bad. Many obstetricians feel it is better to receive criticism for over intervention than to be sued for non-intervention under either set of circumstances. (32)

7.4 Time: This does depend on what country one is talking about. In some countries the obstetrician is the one who delivers the baby. In these cases a planned cesarean would benefit the doctor, delivering during the day when full supportive facilities are available. A cesarean section takes around 30 min, compared an uncomplicated primigravid labor can be expected to take 8 hours or more. Many countries use a mid wife to deliver the baby and the doctor is

only involved in complicated cases. Because the doctor almost only sees complicated deliveries, it does influence their attitude towards vaginal deliveries. (33-35) The concept of informed consent is now well established in the western world. In order to make a truly informed decision about a medical intervention, the women needs to be given full and unbiased information about what is known about the procedure and its risks. (36) In many situations obstetricians are working in a busy clinic with limited time per patient, and many takes the least resistance path, and agrees with the woman's request for cesarean section with minimal discussion about benefits and risks.

7.5 Economic gain: In private clinics where the patient pays, there is more money made on a cesarean section than vaginal delivery, based on hospital stay and operating room charges.

One review showed the economic aspects of alternative modes of deliveries: In the UK cesarean sections cost approximately 750 pounds more than vaginal delivery. If this is done privately and the mother pays, that is one issue. But in the cases of public facilities there is now a discussion if planned cesarean section on maternal request is a waste of tax payers money. The issue of non medically indicated cesarean section is now being considered by medical insurance companies in the united stated and more recently in the UK.

8.Risks and benefits of elective cesarean section:

8.1 The Mother:

8.1.1. Mortality risk: Any analysis of mortality, risk associated with a planned elective cesarean section compared with a planned vaginal delivery, must calculate risk according to the intention to treat, and will include the 5%, 33% deliveries by section that may follow spontaneous or induced labor. Unfortunately, many reports quoting mortality rates use final delivery mode denominators rather than the planned delivery mode.

There is convincing evidence that there is increased mortality and morbidity rate after a "emergency" C section than with "elective". The problem is that there are no universally accepted definitions for emergency and elective C-section, so studies are not 100%.

Analysis of the data reported for maternal deaths in the UK in the triennial reports (39-43) states that there might be a doubling of the risk of maternal death with non-elective procedures compared to elective.

It is clearly not appropriate to look at the incidence of death following all 'elective' or antepartum cesarean sections since some are performed because of pre-existing life-threatening maternal disease (renal insufficiency for example), evolving maternal disease (severe preeclampsia), antenatal obstetric disorders (placenta praevia), or other antenatal complications (antepartum hemorrhage), all of which place the patient at increased risk irrespective of delivery mode.

The most recent Report on Confidential Enquiries into Maternal Deaths in the UK (1997-1999) (44) found that the case fatality rate for direct deaths had a relative risk (RR) of 2.3 for elective cesarean performed for some medical complication; 0.8 for scheduled cesarean delivery performed without a medical indication compared to vaginal delivery (RR = 1.0); the relative risk for emergency cesarean was 12.0. These data suggest that a woman with no medical indication, undergoing an elective cesarean section, has a lower mortality risk than with labor and planned vaginal delivery. Similar analyses have been performed previously, including one study involving 650,000 deliveries in the United States that calculated the death rate associated with a vaginal delivery was 10.8 per 100,000 delivered women compared with 5.8 per 100,000 where the death was directly attributable to cesarean section. (45)

The evolving evidence strongly suggests that mortality directly attributable to the operation is no greater than that associated with a planned vaginal delivery. The recent Term Breech Trial, (46) enrolling 2,083 women from 26 developed and developing countries, found no significant difference in maternal mortality and serious morbidity between the planned vaginal (3.2%) and elective cesarean groups (3.9%) (95% CI 0.79-1.95). These studies are quite in favor for elective cesarean sections. Other studies shows that overall maternal mortality rate is 3-7 times in mothers having a cesarean section compared to mothers who choose to deliver vaginally with an overall maternal mortality rate of 6 per 100 000 procedures.(47,48) But note that this data makes no difference between emergency and elective cesarean sections. In 1993 it was estimated in the United States that 140 women died every year from non medically indicated cesarean section. (136)

	Estimated maternal mortality (per 1000 elective sections)	Number of deaths per 50,000 sections	Number of deaths per 100,000 sections
Sweden	0,04	2	4
UK	0,07	3,5	7
USA	0,18	9	18
Estimated annual number of maternal deaths due to elective cesarean section in the 3 countries, calculated from their respective mortality rates, assuming 50,000 and 100,000 elective cesarean sections per annum, corresponding to a 6,6% and 13,2% elective section rate respectively.(Adapted from Bigham et al.(140), Morrison et al.(141)			

8.1.2 Perineum: Fear of pelvic floor damage was the most common reason (88%) for preferring cesarean section among female obstetricians when completing a questionnaire (49), this is probably the most common reason for a woman to consider an elective cesarean section. Some degree of pelvic floor denervation can occur as a result of labor and vaginal delivery. (51-53) Elective cesarean section can protect the pelvic floor from this denervation injury and reduce the chance of genital tract prolapse. Urinary incontinence consequent upon this damage, can also be reduced by cesarean section compared with vaginal delivery. (54) In a study of anal sphincter function, no new sphincter damage was seen in the 23 women after cesarean delivery, (55) which contrasted with 35% of the 79 primiparae who had demonstrable sphincter damage 6 weeks after their first vaginal delivery, of whom 13% had symptoms of anal incontinence or fecal urgency. The rate of sphincter defects was higher if there was an assisted vaginal delivery with ventouse and forceps having equal impact. (56) Importantly, it has been shown that disturbance to ano-rectal physiology can occur simply

from labor, even when the delivery is by cesarean section. (57) The risks of this happening are apparently limited to those women who achieve a cervical dilatation of at least 8 cm. Short-term urinary incontinence is also more common after vaginal delivery. Questionnaires sent to women 3 months after delivery showed that nulliparous women who had a cesarean section (elective or emergency) had considerably less urinary incontinence compared to those who had vaginal deliveries (24.5% v 5.2%). (58) However, this protective effect was lost after 3 or more cesarean sections with urinary incontinence rates of 38.9% after 3 cesarean sections compared with 37.7% after 3 or more vaginal deliveries, suggesting that pregnancy itself, as well as delivery mode has a role to play. A population survey has also shown an association between pregnancy and pelvic floor dysfunction. (59) When compared with nulliparity all forms of delivery increased the risk of pelvic floor dysfunction (cesarean section OR = 2.5, spontaneous vaginal delivery OR = 3.4, and instrumental delivery OR = 4.3). The difference between cesarean section and spontaneous vaginal delivery was not significant. But if antepartum and intrapartum cesarean sections are considered together, this could underestimate the protective effects of elective antepartum sections.

8.1.3 Psychological sequelae: There is more literature on the psychological consequences of cesarean section than about vaginal delivery. This is quite surprising. Some studies that has been done have shown increased puerperal depression following cesarean section than vaginal delivery, (60-62,150) others studies show no depression.(63-65) There has been reported feelings of guilt, inadequacy and failure for not completing a natural act particularly if the procedure was done under general anesthesia. There has been reported greater anxiety after cesarean sections (60, 66) but others have reported decreased levels. (63,67) a meta-analysis of relevant studies concluded that there was probably no delivery specific relationship.(68) Some researchers have focused on the father and the impact of delivery mode on them, they found that the fathers responded better after a cesarean section compared to a vaginal delivery. (60, 69, 70) cesarean section also appears to benefit the future sexual and emotional relationship between couples. (65, 71, 72)

In the past it has been normal to deliver a dead fetus vaginally, this is also up for discussion if it is psychological benefits avoiding vaginal delivery. A review over 5 years in UK showed that 11% of 919 stillbirths were delivered by cesarean section; 20% were delivered that way because they could not induce the labor or because of maternal request. (73) More research has to be done in this area to reach a conclusion what is best.

We can see from the studies that the reason for the mother having the cesarean section is the heaviest influencing factor upon the emotional reaction. Most cesarean sections are not planned and performed as an emergency and will have greater chance of resulting in a psychological morbidity. The woman's attitude towards mode of delivery is important factor, when a women who wanted a "natural childbirth" need a cesarean section, it will be more stressful for her than for another women who do not embrace the culture of "natural childbirth" and will view the cesarean section positively. (74)

The type of anesthesia used is important, those who only have regional block reduces the chances of psychological morbidity.

8.1.4 Following pregnancy after a cesarean section: The National Sentinel Caesarean Section Audit from the UK (75) showed that a high proportion of antepartum cesarean sections were performed because of the scar from a previous cesarean section and the woman did not want to labor or was advised against laboring. As part of this audit, women were asked their preferences for delivery antenatally and 19.9% of women who had had a previous cesarean wanted a repeat cesarean. When obstetricians were asked their views, as part of the same audit, 95% would offer a vaginal delivery after a cesarean for a breech presentation, compared to 72% after a cesarean for failure to progress. Surveys on trial of labor following a single cesarean delivery show that 65%-88% of women will achieve a vaginal delivery in a subsequent labor.(76,77) However a nonrandomized study has shown that major complications were 1.8 times more common when a trial of labor was undertaken compared to an elective cesarean after a previous cesarean delivery. (78) Most (92.5%) of these complications were in those women who required a repeat cesarean section for failed trial of labor. None of the 6,138 women in the study died and there was a 60.4% vaginal delivery rate and a 0.3% uterine rupture rate in the trial of labor group. It seems highly likely that the majority of women who request delivery of their baby by cesarean section will seek to be delivered that way for subsequent pregnancies. Thus, the risk of uterine scar rupture in a subsequent labor, usually quoted at around 0.1%-1.0% (78-80) is probably not going to be a deterrent to the initial request. The presence of a cesarean section scar in the uterus probably represents a hazard for subsequent pregnancy termination if performed using a myometrial stimulant such as prostaglandins; this risk, however, has not been established in randomized trials.

8.1.5 Reproductive function after a cesarean section: There has been studies that has shown a negative impact on a woman's fertility after a cesarean section.(81) This has been considered by some to do with mechanical reasons, rather than loss of desire to get pregnant.(82-84) an increase in spontaneous miscarriage(85,86) and an increase in the risk of subsequent ectopic pregnancies.(86) Many women report to have fears of a another pregnancy following both abdominal and vaginal delivery, although fear is more frequent after an instrumental delivery and cesarean than spontaneous vaginal delivery.(60,63,87,88) There has been suspicions that cesarean sections will increase the chance of menstrual symptoms later in life. This is not well documented, but there is evidence that the mechanical impact of the scar in the lower uterine segment, can lead to development of distorsion and fibrosis of the endometrial layer even polyp formation, which might give rise to menstrual symptoms.(89) Women who have repeat pregnancy after a cesarean section are 2.6 times more likely to have placenta previa, and the risk increases with every c-section.(90-93) Placenta accrete occurs more in patients with placenta previa and a prior c-section. Patients with placenta previa but no c-section will have a 4,5 % risk for accrete, while women with both placenta previa and a previous c-section the risk of accrete is 24-38%.(90,91) If accreta occurs there is a real risk of having to perform a hysterectomy.

8.1.6 Distorsion of a natural process: Labor is a physiological process, many argue that doing an elective cesarean to avoid it is doing an unnatural act. The counter argument is that most medical practice is unnatural and that evolution of man to walking biped and the development of a large brain have made the process of childbirth hazardous. (139)

8.1.7 Cesarean section and other complications: There are complications in 1 out of 5 cesarean sections in Norway. There are more complications in an emergency cesarean (24%) than an elective (16%) (146) A women delivering by cesarean section loses more blood (500-1000ml) than a person delivering vaginally (200-300ml), this results in greater need for blood transfusions and its risks. Even though blood is screened toughly now there is a risk of transmission of infections. Transfusion also increases the risk of developing atypical antibodies with implications on future pregnancies as well as mother if she would need another transfusion in the future. (136)

If one needs an emergency cesarean section the risk of complications is increasing thus further you are in the stages of labor. 1/3 got complications if one has a cesarean in the 2 stage of labor. There are also more complications in cesareans done before 30 weeks gestation, large babies over 4500 grams and small babies less than 1500 grams. (146)

Women who have had a c-section are at increased risk of postpartum hemorrhage, uterine rupture and urinary tract injury. (94, 95) The risk of uterine infection following a cesarean birth is 10-50% vs. 1-3% in a vaginal delivery. (96) Women who have had a cesarean is twice as likely to be readmitted for complications after birth.(97) Women with a prior cesarean section has more than double the risk for an unexplained stillbirth during subsequent pregnancy (RR of 1.77/1,000 vs. 0.89/1,000 with prior vaginal birth) (98)

The operation itself gives a risk of formation of adhesions in the abdominal cavity. Sub ileus problems therefore more abdominal pain and increased risk of organ damage with future intra abdominal surgery. Once one has had one cesarean many have cesarean the following pregnancies and the risk of organ damage increases with each abdominal delivery. Increased risk of tromboembolic events(now lower than before cause of use of compression stockings, heparin administration.), higher postpartum rate of cardiac arrest, wound hematoma, hysterectomy, major puerperal infections, anesthetic complications, hemorrhage requiring hysterectomy.(118)

Hospitalization is 3 times longer on average following a c-section than a vaginal delivery. (137) A women will have difficulties driving a car and should avoid heavy lifting after, this can be a problem for new mums.

8.2 The baby:

8.2.1 Respiratory function: Women commonly believe that elective cesarean sections carries no risk to the baby.(138) Babies that are delivered by cesarean section before labor at 37 weeks gestation result in a dramatic increase in neonatal breathing difficulties compared to babies born vaginally at 41 weeks gestation.(99,100) Babies born by C-section have a 5 times greater risk for respiratory issues than babies born vaginally, like transient tachypnoea and respiratory distress syndrome(101) it has shown that experiencing labor helps the baby's transition from the life in the womb to the life outside where it has to breath air.(102) this might help to explain the increased rate of respiratory difficulties that babies delivered by cesarean section have. Fortunately it seems like the long term outcome appears to be good for the babies who do get respiratory issues in these circumstances.

8.2.2 Physical trauma: There are well-recognized hazards for the baby during a vaginal delivery. Physical trauma including skull fractures, facial and eye damage and intracranial bleeding, all more common with assisted vaginal delivery but also following spontaneous vaginal delivery, can be reduced but not excluded with delivery by cesarean section. Cephalhaematoma may occur following cesarean section but is less common than with vaginal delivery. Subgaleal haematomas with the associated serious consequences are almost nonexistent with cesarean section, but are a known complication of ventouse extraction, although relatively rare. Scalp abrasions and trauma to the fetal face by placing the forceps or ventouse wrong will be virtually eliminated. Direct trauma to the baby also happens in cesarean sections as incisions of the fetal face, shoulder and buttock or thigh may occur when opening the uterus at cesarean section, and occurs in 0.2%-1.5%. (103,104) Such damage is more common with a fetal breech presentation (6%) than cephalic presentation (1.4%) but fortunately is usually very superficial and healing is generally quick with little scarring. (103) Shoulder dystocia, which in the majority of cases cannot be predicted, can result in upper arm and clavicular fractures, neuropraxia and nerve plexus palsies, all of which are mostly eliminated with cesarean section. Nerve plexus damage does, however, occur with delivery by cesarean section, (105) Soft tissue damage, especially intra-abdominal organ rupture, associated with breech delivery in inexperienced hand, will generally be avoided. Although term breech delivery has been discouraged by many at the present time, such deliveries will still be necessary if advanced labor presents preterm or for the delivery of a twin.

8.2.3 Perinatal Asphxia: Cerebral palsy is caused by intrapartum hypoxemia and asphyxia. This usually goes unnoticed or is not detected on cardiocotography. It is sometimes a result of unexpected complications as umbilical cord prolaps, other cord accidents, placental abruption and uterine rupture, damage might occur even though prompt intervention is done. Intrapartum care is often blamed in the outcome of cerebral palsy but a Australian case-control study showed that there was only evidence of intrapartum hypoxia in 15% of cases of neonatal hypoxemic-ischemic encephalopathy (HIE).(106) In these cases antepartum factors were often present and only 6% of cases had intrapartum events alone. Others have shown a more obvious association between neonatal HIE and cerebral palsy. (107)

8.2.4 Transmission of infection: Cesarean section reduces the transmission of HIV and Herpes simplex. GBS, Chlamydia and Gonorrhoea are transmitted as well through the birth canal. It is now routine to deliver the baby by cesarean if there is a risk of transmission of infection through the birth canal.

8.2.5 Delayed consequences: There have been studies suggesting that the method of delivery might have an effect upon the physical and mental health of the baby later in life.

Babies who have been delivered by cesarean had higher rates of admission to the neonatal unit, need for supplemental oxygen, hypoglycemia, and respiratory problems.

There has been done a lot of research on the hypothesis that cesarean section will predispose to asthma and allergy later in childhood. By changing the microbial colonization of the airways at the time of delivery this may alter the lymphocyte mediated immune mechanisms. A prospective study reported an odds ratio of 3.2 for doctor diagnosed asthma in a cohort of adults born by a c-section,(108) but the study failed to show a connection to delivery mode and other atopic disorders that would be expected from the proposed mechanism. An earlier study by the same group (109) reported a 40% increased incidence of asthma in seven year old's who had been delivered by cesarean section comparing them to children born vaginally. The study design did not distinguish between antenatal and intrapartum cesarean sections. Children born by cesarean section also have an increased risk of developing Type 1 diabetes and obesity later in life. (127,128) although the physiological determinants of short-term infant morbidity are largely understood, the biological pathways that lead from caesarean delivery to compromised adult health remain unknown. Epigenetic alteration of gene expression by the endocrine milieu of labour might affect long-term hepatic and other metabolic responses (129) and modify immune function. Mode of delivery is also likely to affect the gut microbiome, which can increase energy harvesting(130) from food and predispose to obesity.

There is a hypothesis that states that perinatal events could affect the hypothalamo-pituitary axis in the long term.(110) The stress response to the routine immunization given at 8 weeks of age have been found to differ from those babies born by cesarean section compared to vaginal delivery. This gives some support to the hypothesis.

An investigation of the intellectual ability of 7 year olds found that those born by elective cesarean section achieved lower scores in some skills compared with those born by other methods. (111) However, long term follow-up of babies delivered in breech position either vaginally or by cesarean section failed to show a difference in psychomotor skills later in childhood, despite a greater incidence of hypoxia in those delivered vaginally. (112)The evidence that cesarean section avoids mild intellectual impairment remains unclear.

A retrospective study shows an increase in adult suicide and schizophrenia rates associated with births by cesarean section. (113)

8.2.6 Parent-Infant bonding: As with maternal reaction after vaginal and cesarean delivery, the influence on bonding appears to be little influenced by the mode of delivery per se. (63, 70) If breastfeeding is an important part of mother-child bonding, there is evidence that breastfeeding is less readily adopted after delivery by cesarean section than vaginally, (114,115) However, once established, persistence with breastfeeding was no different between the 2 groups. As referred to earlier, father bonding is possibly enhanced for babies born by cesarean section

9. The economics of a cesarean section:

Today it is more expensive doing a cesarean section than a vaginal delivery. Most countries provide a mixed service of elective cesarean and delivering naturally with a midwife. An attempt has been made to calculate the cost of a service only providing elective cesarean sections. The theater and ward requirements would be the same but the staffing levels would be reduced if all deliveries were planned cesareans. This would be less costly. Every year one has to pay out big sums for litigation of medical negligence leading to brain damage and cerebral palsy. This could be avoided by planned antepartum cesarean section. Conclusion is that elective cesarean for all would save money rather than added costs to health service bills. (116)

Another way of seeing it is that there will never be a health service which bases delivery mode on only elective cesarean sections, women have the right to choose and many do still choose to do it the “natural way”. And in this mixed practice cesareans do cost more (In Norway it’s estimated that a cesarean costs 55.000 KR vs.22.000 for a vaginal (117)) while an obstetrician is held up in the operation theater many other duties had to be down prioritized for that time. One needs more resources doing a cesarean than a vaginal delivery. Most countries, even the developed ones have a shortage of staff on duty on all time.

10. Consensus statements:

The FIGO publication on ethical issues in obstetrics and gynecology (147) includes recommendations regarding cesarean delivery for non-medical reasons. This document concludes that on current evidence cesarean section for non-medical reasons is ethically not justified. Their comments are as follows:

- there is concern throughout the medical profession at the increasing rate of cesarean delivery.
- Cesarean section is more expensive than normal delivery and as a surgical intervention has more potential hazards for mother and baby.
- Physicians have a professional duty not to harm their patients; this includes a moral obligation to endeavor to use health resources appropriately.
- Physicians are not obliged to perform a procedure for which there is no certain medical Benefit.
- At present there is no hard evidence on the relative risks and benefits of cesarean section for non-medical reasons compared with vaginal delivery at term. Available evidence suggests that vaginal delivery is safer in the long- and short-term for mother and child.
- Physicians have a duty to inform and counsel women about these issues. Non-medically indicated cesarean section is a privilege that some healthcare systems can and others cannot afford to offer. As doctors, we should make evidence-based recommendations if evidence exists, explain the uncertainty if it doesn’t, ensure women understand this information, thus helping them to make a decision, taking account of their own values and beliefs (148).

11. Summary:

Medicine is changing, especially in obstetrics. We now have to involve patients in decision making. In this partnership we have to try to educate women about risks and benefits for both her and her child for both vaginal and cesarean sections.

Women today want avoid risks and decrease uncertainty. There is no guarantee that a woman will deliver without complications before the onset of labor, and many feel that they decrease the risks and uncertainty by opting for a cesarean section. But cesarean sections have their own risk profile. Many studies have shown that a planned antepartum cesarean section has less risk than intrapartum cesarean sections. Some would say that a planned cesarean section is as risky as a vaginal delivery, but the risk profiles are different.

Different countries have different approaches towards allowing cesarean sections on maternal request. In Italy a woman has the right to choose, while in Norway the woman has only the right to decide together with the physician. This is also reflected in the numbers of cesarean sections in the different populations.

Some countries deliver babies with help of mid wives and other places obstetricians have to deliver the baby. In the world we live in time is of the essence and there is no exception when it comes to obstetricians. If the obstetrician need to deliver the baby it would be more convenient to offer a planned cesarean section so both mother and doctor knows when the baby will arrive.

In these days it is not unusual to read about doctors getting sued for malpractice. This is a constant worry for most doctors, many feel that doing too much is better than doing too little. And offering a cesarean section is absolutely doing something, even though it is not always needed. In a private setting a cesarean section creates more income than a normal delivery. But in a public situation where the government picks up the bill a cesarean section offered to too many is a costly affair where a cesarean costs the double of a vaginal delivery.

12. Conclusion:

The increasing rate of cesarean sections in the developing part of the world has been a distressing topic. To be able to do something about the increasing trend one has to understand the factors leading to it. Only then can one take action to change it. If the cesarean section rate should decrease the attitudes of obstetricians and mothers need to change. The doctor needs to spend time to inform the patient about risks and benefits without letting their personal opinion about the matter shine through. Remember the oath to do no harm. Mothers are often influenced by what media and friends tell them, and as a doctor it is their job to give them the correct story so they can make a balanced decision.

There has been a common misconception that all elective antepartum cesarean sections are because of maternal request, but many are in fact also because of “obstetrician’s request” either because the mother feels pressured or the obstetrician does a poor job informing the patient.

Because primary elective cesarean deliveries have not been a common practice, there is little scientific data about this procedure alone. The majority of literature about maternal and newborn outcomes after a vaginal birth and/or cesarean birth has been based on a mix of simple and complicated cesarean and simple and complicated vaginal deliveries.

The safety data and outcomes for cesarean sections performed on maternal request will differ significantly from those associated with various medical indications for the procedure.

The data needed for making an informed choice regarding an elective cesarean delivery does not, for the most part, exist. ACOG’s committee statement emphasizes that “the ethical evaluation is clouded by the limitation of data regarding relative short- and long-term risks of cesarean versus vaginal delivery.”(149)

In 2006, the NIH convened a consensus conference to address cesarean delivery on maternal request. They resolved that the evidence supporting this concept was not conclusive. Their recommendations included that cesarean delivery on request should be avoided by women wanting several children, should not be performed before the 39th week of pregnancy or without verifying fetal lung maturity.

After reviewing the reasons why women and obstetricians want cesarean sections, the risk and benefits of both vaginal and cesarean delivery, one realizes what a complex topic this is. Cesarean sections is a more costly affair, but so is a vaginal delivery if complications arise. Vaginal deliveries are more time consuming, but the hospital stay after a cesarean section is longer. With every positive thing one says about either vaginal or cesarean delivery there is always a negative one that follows. And to draw a conclusion on what choice is best is very difficult.

It is still hard to say if a woman should have the right to choose a cesarean section for no medical indication or not. Should the physician be willing to do it? Is another hard question to answer. The best way to make decisions about mode of delivery should be made after the physician provides the best evidence-based information possible, to respect her autonomy and decision-making capabilities. With this she can make a balanced decision. It is important that she understands that this decision is made for two individuals, for her and her baby.

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