

# Determinants of high and low rates of Caesarean deliveries in Belgium.

## A REPORT OF THE COLLEGE MOTHER AND NEW BORN

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**G. Absil\*, A.-S. Van Parys\*\*, S. Bednarek\*, A. Bekaert, Cl. Lecart, C. Vandoorne\*, G. Martens\*, M. Temmerman\*\*, J.-M. Foidart\*, the members of the College (P. Bernard, G. Page, M. Hanssens, D Leleux, A. Verougstraete, J. Van Wiemeersch) and the consulted experts (S. Alexander, B. Bollen, J.-L. Deville, R. Devlieger F. Doucet, P. Emonts, A. Loccufier, C. Lucet)**

**\* University of Liege**

**\*\* Gent University**

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## I. Introduction

### Epidemiology

The caesarean section (Cs) rate continues to rise in many countries with good access to medical services, yet this increase is not associated with improvement in perinatal mortality or morbidity. The World Health Organization states that no region in the world is justified in having a caesarean section rate greater than 15 percent [1,2] which is the median percentage observed worldwide. USA, Mexico, Brazil, and Italy have the highest rate (over 35 percent) and Africa has the lowest (under 5 percent). The mean caesarean delivery rate in developed countries is 21.1 percent, but is only 2 percent in the least developed countries. The caesarean delivery rate in China ranges from 20 to 60 percent, depending on whether the hospital is rural or urban [4-6] and was 25 percent in teaching hospitals in India [7].

In Belgium, the Cs rate was in 2004 18.5%.

### The present situation in Belgium

**The perinatal epidemiology (SPE\* and CEPIP\*\*) reports in 2009 a global Caesarean section rate of 18.5 % in Flanders (range : 12%-29%), 19.9% in Wallonia (range: 7.9% - 32.1%) and 18.0 % in Brussels or respectively 19.8 %, 20.5 % and 18.9 %, of all newborn babies.**

**These data are identical to the 2008 figures.**

\* : H. Cammu, G. Martens, E. Martens, C. Van Mol, P. Defoort : Perinatale activiteiten in Vlaanderen 2009 (<http://www.zorg-en-gezondheid.be>).

\*\* : Minsart AF, Van Leeuw V, Wilen G, Van de Putte S, Verdoot C, Englert Y : Données périnatales en Région wallonne – année 2009. Centre d'Epidémiologie Périnatale, 2011.

91.4% of breech presentations were delivered in 2009, by Cs in Flanders and 90.1% in Wallonia and 86.1% in Brussels (singletons alive). The induction rate was 24.2% (range 13.1-38.3) in Flanders and 33.3% in Wallonia (range 22.6-59.3) and 27.7% in Brussels. Considering the population of primiparous women who delivered after 37 weeks to a single alive fetus in cephalic presentation, the Cs rate among induced labours was 19.3% in Wallonia and 17.5% in Brussels. Those figures were respectively 13.1% and 12.0% in spontaneous deliveries. This confirms our previous demonstration that elective labor induction for non medical reasons is associated with an increased risk of Cs.

### **Consequences**

The **short-term risk for the mother** is postpartum morbidity and reduced fertility. The major nonanesthesia-related complications related to caesarean delivery are infection, hemorrhage, injury to pelvic organs, and thromboembolic disorders.

The **long term risks** are an increased risk of abnormal placentation in future pregnancies. A meta-analysis (n = 3.7 million women) reported the baseline frequency of placenta previa was 1 in 200 deliveries. However, in women with at least one prior caesarean, the risk of development of placenta previa in a subsequent pregnancy was two to three times higher than at baseline, and the risk increased with the number of prior caesarean births [34]. The higher rate of placenta previa is of concern, due to the inherent risks of this disorder and because of the increased frequency of placenta accreta in women with placenta previa and a prior hysterotomy. There is an increased risk of placenta accreta with increasing numbers of prior caesarean deliveries even in the absence of placenta previa.

For **the child**, Cs is associated with postpartum respiratory morbidity, less breast-feeding and possibly more atopic disease. The fetal risks include iatrogenic prematurity and birth trauma; the latter occurs in 0.4 to 3 percent of caesareans and consists mostly of mild lacerations related to emergency delivery [27-31]. Transient tachypnea of the newborn (TTN) is more common after scheduled or planned caesarean birth. In a review of 29,669 deliveries, the incidence of TTN was about three times higher after planned caesarean than after vaginal delivery [32]. Caesarean delivery has also been reported to be a modest risk factor for respiratory distress syndrome (RDS), particularly if the caesarean was performed in a nonlaboring patient [33].

For **society**, the cost of a caesarean section is not dramatically different from that of a vaginal delivery, taking into account delivery with oxytocin or epidural anesthesia. The average cost for all women who attempt vaginal delivery was only 0.2% less than the per-patient cost of elective cesarean delivery (Bost BW. Cesarean delivery on demand: what will it cost? Am J Obstet Gynecol 2003; 188:1418).

### **In summary**

**The major short-term complications related to caesarean delivery are infection, hemorrhage, injury to pelvic organs, and thromboembolic disorders. The major long-term risks are abnormal placentation and issues relating to route of delivery in future pregnancies. There is thus every reason to attempt prevention of a further increase in caesarean section rates.**

### **Causes: a mix of medical and non medical indications**

The rise in prevalence of caesarean deliveries in developed countries has been attributed to multiple factors, including changes in physician/patient expectations and attitudes about risk, changes in clinical practice (e.g., fewer trials of labor after previous caesarean delivery, vaginal breech births, and instrumental deliveries; more inductions of labor and caesarean deliveries by maternal request), medico legal concerns, and financial issues [10-13]. Increasing maternal age at delivery, an increase in the proportion of births among primi gravidae > 30y, and the increased prevalence of multiple gestation and maternal obesity are also factors. In summary, medical factors but also non medical factors contribute to the enhancement of the Cs rate.

The CEPIP and SPE 2009 data for Belgium confirm that the three most frequent causes of caesarean section in Belgium in 2009 are:

1. fetal malpresentations (mainly breech) : 36.3% of all Cs in Flanders, 17.8% in Wallonia and  $\pm 22\%$  in Brussels;
2. repeat Caesarean section : 24.7% in Flanders and 21% of all Cs in Wallonia and  $\pm 29\%$  in Brussels;
3. dystocia : 24.5% in Flanders, 24.7% in Wallonia and  $\pm 23\%$  in Brussels.

**It may therefore be concluded that  
it is essential to avoid the first unnecessary Caesarean section,  
since subsequently most obstetricians will repeat a second Caesarean section.**

## II Medical indication

The four most common medical indications for caesarean delivery according to the international literature account for approximately 80 percent of these deliveries [16]:

1. Failure to progress during labor (30 percent)
2. Previous hysterotomy (usually related to caesarean delivery, but also related to myomectomy or other uterine surgery) (30 percent)
3. Nonreassuring fetal status (10 percent)
4. Fetal malpresentation (11 percent)

Additional, less common indications for caesarean delivery include, but are not limited to:

- Abnormal placentation (eg, placenta previa, vasa previa, placenta accreta), maternal infection (eg, herpes simplex or human immunodeficiency virus), multiple gestation, fetal bleeding diathesis, mechanical obstruction to vaginal birth (eg, large leiomyoma or condyloma acuminata, severely displaced pelvic fracture, macrosomia, fetal anomalies such as severe hydrocephalus;
- increased risk of complications from tissue trauma related to cervical dilation, the descent and expulsion of the fetus, or episiotomy (invasive cervical cancer or active perianal inflammatory bowel disease, or past repair of a rectovaginal fistula or pelvic organ prolapse);
- (not routinely indicated) for fetal issues :extremely or very low birth weight (<1000 g and ≤1500 g, respectively) [17], or certain congenital anomalies (some skeletal dysplasias, and gastroschisis with herniated liver) [18,19]

## III The non medical factors : identification of factors that influence the CS decision.

Since there is no correlation between Cs rate and improved fetal or maternal outcome, it is important to better understand the non-medical parameters resulting in enhanced number of unnecessary Caesarean sections. It is hoped that the elucidation of such factors and use of non-clinical interventions, applied independently on patient care will reduce the unnecessary Cs rate in low risk pregnancies (Low risk pregnancy is defined as: singleton, vertex, full-term, live born, <4500g,>2499g)).

A recent Cochrane study (Non-clinical interventions for reducing unnecessary caesarean section. Cochrane Database Syst Rev. 2011 Jun 15) concluded that:

1. Implementation of guidelines with mandatory second opinion can lead to a small reduction in caesarean section rates, predominately in intrapartum sections.
2. Peer review, including pre-caesarean consultation, mandatory secondary opinion and postcaesarean surveillance can lead to a reduction in repeat caesarean section rates.
3. Guidelines disseminated with endorsement and support from local opinion leaders may increase the proportion of women with previous caesarean sections being offered a trial of labor in certain settings.
4. Nurse-led relaxation classes and birth preparation classes may reduce caesarean section rates in low-risk pregnancies.

The College identified:

- Factors other than medical reasons, that are associated with differential Cs rate;
- Differential organizations already in place in some hospitals (and absent in others), that contribute to prevent (or reduce) unnecessary Cs;
  1. Whether or not validated tools to decrease the unnecessary Cs rate are also operational in Belgium in maternities with low Cs rate and absent from maternities with high Cs rate.

## **Population**

Twelve maternities were chosen following the criterion of language and Cs rate (3 high, 1 low & 2 median in Dutch speaking Community, 3 high and 3 low in French speaking Community). The maternities were characterized following a high, an average or a low Cs rate by independent expert of the SPF. In each maternity, the researchers have interviewed: 1 gynecologist head of the department, 2 gynecologists, 1 head midwife, 1 midwife.

Until the interpretation of the results, the study was double blinded. The researchers and the experts did not have access to the real Cs rates of the visited maternities.

The information gathered through interviewing the professionals was analyzed by means of a thematic analysis and a reduction methodology process. In other words, the information was successively analyzed by different methods in order to produce a structured, condensed and thick set of results. The reduction was helped by the use of the program Nvivo (A well-known Qualitative data analysis software, qualitative research).

## **What are the differences between maternities with low and high rates Cs ?**

### **Common factors**

The study demonstrates common factors found in all maternities, independently of the Cs rate. In all maternities, professionals speak about the difficulty of interpreting the Electronic foetal heart rate monitoring (EFHRM). They discuss its low specificity, excessive sensitivity and its high false positive rate. This seems to be a major factor contributing to recognize the advantages of

the STAN and to recommend its use.

Young obs/gyn are stigmatized by their older colleagues for their lack of working experience and therefore would prefer to perform a Cs since they perceive it as a 'safer' option. Moreover, all professionals recognize a loss of confidence in instrumental obstetric or in their capacity to practice it. They are also all concerned about the legal pressure perceived as a powerful pressure that does not allow professionals to take any risk.

Besides, some professionals say that they try to preserve their quality of life by means of induction or Cs. Convenience induction becomes a tool to manage the alea of their agenda. Finally, the obstetric practice is embedded within a technological paradigm: the technological improvement (e.f. STAN) puts the professionals under additional pressure: accountability and responsibility towards the parents.

### **Factors discriminating between low and high Cs rates**

In all maternities with low CS rates, managing the parental pressure is seen as a part of the duty of guiding patients throughout pregnancy.

Low Cs rate maternities are characterized by a "working culture" favoring physiological delivery and avoiding unnecessary preterm induction for convenience. This policy is supported by staff meetings and/or staff training. This culture resists the idea that a Cs would be a better/safer option for the newborn.

The low Cs rate maternities are organized to avoid a stressing context. The working organization avoids professional isolation, and ensures a second opinion before performing a Cs. Management of the stress is well illustrated by the way the medico-legal pressures is not a pretext to use with uncertainty "the grey zone of a non reassuring monitoring ", or to misuse the interpretation of monitoring to legitimate a Cs decision.

In maternities with high Cs rates, ob/gyn indicate often that they feel alone facing a decision of which they carry the legal responsibility. When they face a doubt, professional isolation often leads to the "no short term risk" decision. Taking no risks implies preferably performing a caesarean section. This procedure is perceived as more controllable than guiding women through physiological labor.

In practice in high Cs rate maternities, we note factors that contribute to construct a social representation predisposing to Cs. The ob/gyn develops a true relativism about the evidence based guidelines and other recommendations. Following such a social representation, the "alleged exception" allows the professional to deviate from a good practice. As such clinicians say "each pregnancy is unique and I am therefore allowed not to take into account the guidelines or recommendations". Such excuses allow to avoid strict adherence to the established guidelines. Most often, the ob/gyn finds the excuse to deviate from the recommendations in the social context of the parents. More professionals in maternities with high Cs rates also exploit in a subjective way the « grey zone » of borderline anomalies. In other words, they are ready to interpret any deviation of the fetal heart rate pattern as a pathology and perform a Cs as a form of "defensive medicine" that protects them from a legal suit, or to turn a normal pregnancy into sickness in order to transform it into a high risk pregnancy and to legitimate the CS decision.

From the visits and qualitative assessment of the non medical parameters that influence the Cs rates, some discriminating factors were evidenced between maternities with high and low rates of Cs:

1. Differences in the organization: isolated management or team work / (systematic second advice) with staff meetings, training sessions, permanent education;
2. Differences in the promotion of physiological births : Maternities with high rates of Caesarean section do not promote the physiological births, but often, justify the "well-being" of the child to justify a Caesarean decision, that is not based on objective criteria;
3. Differences in the handling of the parental psychological pressure;
4. Differences in legitimating induction;
5. Different attitudes toward litigation;
6. In maternities with low rates of Cs the parental pressure is tempered and not taken into account by the team beyond reasonable limits because it is considered as a somewhat normal and usual parameter in the relationship with the parents. Planned Cs decisions are being taken by the team, and Cs in labor, as much as possible with a second opinion. Guidelines are available and regularly discussed and updated by the staff. Finally the physiological delivery is promoted by most obstetricians in such maternities. Meetings, staffs, evaluations of individual practices are reviewed at regular intervals.
7. In maternities with high Cs rates isolated obstetricians take their decisions alone. They tend to "manipulate" and adjust the limits of the various scoring systems, tests in order to justify their decision of performing a Cs (gray zone of subjective assessment of a medical parameter). They perceive themselves the Cs as less risky than the normal vaginal delivery, even in low risk pregnancies. The parameters of the partograms are more often used to justify a posteriori a Cs decision. Their rate of induction for personal reasons is also significantly higher.
8. A few other factors that can potentially affect the Cs rates although we could not firmly conclude from this limited study are the fact that the obstetricians are mainly isolated independents without a team spirit and no leader, and the several tools used for the surveillance of the parturient (monitoring, STAN, pH, partogram...) are more often considered as a possible threat rather than reassuring instruments documenting the safety of the vaginal route. Finally, the freedom of deciding alone is considered in the high Cs rate maternities as the sovereignty of the medical decision.

Several factors may play a significant role in reducing or preventing the unnecessary Cs rates. However the study could not demonstrate their role in all visited maternities, for example: duty organization, team building politics, head of the department politics, fetal monitoring, medical sovereign opinion. The medical sovereign opinion does not seem to differentiate low and high maternities. For example, in the low Cs rate maternities, the "medical sovereign opinion" is framed by the existence of staff meetings, respecting guidelines and pro-physiological culture. On the contrary, medical sovereign opinion plays another role in maternities with a high Cs rate. There, the professionals are prone to assume their liberty of decision. This liberty is no more

framed as in low Cs rate maternities, but more often linked with the opportunities of interpreting « grey zone » or to justify a decision by their legally recognized expertise.

## **IV Recommendations to reduce the Caesarean Section rates**

### **a. Medical factors**

The causes of Cs inflation are multiple. Among them, our previous report (2009) has evidenced several medical factors. The most prevalent is the inappropriate induction of primigravidae with unfavorable cervix (a Bishop score  $\leq 6$ ). The second medical factor is the automatic repeat Cs delivery after a first Cs performed for non mechanical dystocia reasons.

It appears therefore wise to recommend for the delivery of low risk unifetal pregnancies:

1. Enforcement of a policy prohibiting induction of labor before a term of 40 weeks;
2. Induction restricted to women with a Bishop score of at least 6;
3. Post term induction should be considered from 41.5 weeks, only;
4. Discussion with the parents to evaluate the benefits/risks of a trial of labor in women with a previous Cs. (TOLAC) Several guidelines have been edited that allow in safe conditions a vaginal birth after caesarean delivery (VBAC);
5. To implement in case of induction a policy of informed consent that allows the mother to be fully informed of the possible consequences and benefits of an induction for non medical reasons;
6. When the Bishop score is not modified after local application of prostaglandins for convenience induction, the procedure should be stopped and the lady should be sent home with the message that her uterus is not ripe to enter in labor.

### **b Recommendations pertaining to the health care organization**

Multifaceted strategies, based on audit and detailed feedback, are advised to improve clinical practice and effectively reduce caesarean section rates. Moreover, our findings indicate that identification of barriers to change is a major key to success.

- 1. A team-work approach with a better organization to prevent the isolation of practitioners;**
- 2. A policy of mandatory second opinion for all Cs (planned or not);**
- 3. Written Guidelines available for all physicians at the hospital;**
- 4. Regular discussion and updating of the guidelines to implement their daily use;**



- 5. Individual feedback provided to the obstetricians about their practice including Cs rates with possible face to face interviews;**
- 6. Monthly medical audits of the Obstetrical practice;**
- 7. Discussion at Seminars, peer-review meetings (GLEMs) of the Cs rates and circumstances;**
- 8. Organization of pre-caesarean section consultations.**

Finally, these recommendations were implemented among the trainees, hospital staff members, private practitioners having an obstetrical activity in an academic center during the year 2010. The rate of Cs delivery decreased from 26,0 to 20,2 %. The Cs rate associated with the MIC unit was not modified. The decrease resulted almost exclusively from a significant reduction in the number of Ceasarian deliveries performed in women presented with a low risk pregnancy, demonstrating the efficacy of such measures when collectively implemented.

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