

Evolution of indications to cesarean section based on own material in two time periods: 2002–2007 and 2008–2014

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SUMMARY

Introduction. In recent years, the frequency of cesarean sections has been constantly rising. The reasons for this phenomenon include: economic factors, increasing medicalization of labor, technological progress of medicine and the associated increase in the number of pregnant women suffering from various diseases, the development of assisted reproductive technology and the “epidemic” of court cases. **Aim of the study.** The aim of the present study was to compare selected indications for cesarean sections in two time periods.

Materials and methods. The material came from 6915 patients who had cesarean sections performed in 2002–2014.

Results. In 2002–2007, the most frequent indications for cesarean section were: threatening fetal asphyxia, abnormal fetal positions and fetal head high straight bit. In 2008–2014, the most frequent indications were: threatening fetal asphyxia, abnormal fetal positions and the lack of agreement for vaginal labor in patients post the previous cesarean section.

Conclusions. In the time periods 2002–2007 and 2008–2014, the proportion of performed cesarean sections increased. Threatening fetal asphyxia was the most frequent indication. The lack of consent to natural labor in patients who had previously undergone cesarean section was a new indication that occupied the third place among the most frequent indications for a surgical delivery in 2008–2014. A statistically significant increase in the number of twin pregnancies, as an effect of assisted reproductive technology, influences the rise in the proportion of cesarean sections.

Key words: cesarean section; indications for cesarean section; threatening fetal asphyxia, assisted reproductive technology, twin pregnancy

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INTRODUCTION

In recent years, the frequency of cesarean sections has been constantly rising worldwide. In the USA, the cesarean section rate increased six-fold in 1970–2008 (every third pregnancy is concluded surgically) [1]. In the 1970s and 1980s, the cesarean section rate ranged from 5–13% [2,3] and increased to 12–25% in the 1990s [4]. Currently, it exceeds 30% [5,6]. It is twice as high as WHO recommends; only 15% of pregnancies should be concluded by a cesarean section [7]. The reasons for this increase include: economic factors, increasing medicalization of labor, technological progress of medicine and the associated increase in the number of pregnant women suffering from diseases that used to prevent pregnancy or carrying it to term. Also, lower demographic indices observed in developing and developed countries and a problem associated with decreased fertility decide about the selection of a cesarean section as a method of delivery that reduces neonatal mortality.

Moreover, increased cesarean section rates result from perfected assisted reproductive technology, which results in a greater number of high-risk pregnancies and greater anxiety in patients who have experienced long infertility treatment and are concerned about the course of pregnancy, labor and having a healthy child. This anxiety is also associated with costs incurred for the diagnostic and therapeutic procedure itself. Another significant issue is more common legal or “media-popular” claims against obstetricians. In light of the “epidemic” of court cases, attention should be paid to the fact that, in many cases, there are no transparent and unambiguous guidelines concerning obstetric indications for cesarean sections. Legal claims are usually associated with too late performance or refusal to perform a cesarean section. This primarily concerns situations which are not

absolute indications themselves but in which a delayed decision about surgical delivery might have contributed to worse condition of a newborn. For example, this situation concerns cardiotocography interpretation, which might result in the increasing frequency of threatening fetal asphyxia as an indication for a cesarean section, observed in many centers and countries. Thanks to the progress in the field of medicine, including in obstetrics, neonatology and anesthesiology, maternal and neonatal mortality associated with surgical delivery has decreased considerably. One should remember, however, that it still carries an increased risk of complications that are serious for both the mother and child compared with vaginal delivery. An increasing rate of primary cesarean sections results in a proportional rise in repeated surgical deliveries. This results both from absolute indications, such as: threatening uterus rupture at the scar after prior surgery, and the fact that patients after prior surgical delivery can decide about the manner of concluding their next pregnancy, which is stated in the standards of the Polish Gynecologic Society from 2008.

AIM

The aim of the present study was to compare selected indications for caesarean sections in two time periods: 2002–2007 and 2008–2014 based on own material.

MATERIAL AND METHODS

The material came from 6915 patients who had caesarean sections performed in 2002–2014. The most frequent indications for surgical delivery were analyzed. The statistical analysis was performed using a nonparametric chi-squared test in the STATISTICA program.

RESULTS

There were 9090 childbirths in 2002–2007, of which 2833 were conducted via cesarean section. This constitutes 31.2%. In 2008–2014, 10,023 women gave birth and 4082 of them delivered surgically, i.e. 40.7%. In the analyzed time periods, the percentage of performed caesarean sections increased from 31.2% to 40.7% ($p < 0.05$). Table 1 and Figure 1 present the number of indications to cesarean section

Tab. 1. A comparison of indications for caesarean section in 2002–2007 and in 2008–2014

Indication for cesarean section	Years 2002–2007		Years 2008–2014		p
	%	number	%	number	
Threatening fetal asphyxia	25,60	725	27,90	1141	>0,05
Breech position	13,40	379	9,70	397	<0,05
Transverse/oblique lie	5,10	145	3,57	144	<0,05
Fetal head high straight bit	12	341	7,60	311	<0,05
Cervical dystocia	3	85	4,30	178	<0,05
Placental pathology	3,10	89	2,10	86	<0,05
Cephalopelvic disproportion	2,70	76	3,20	132	>0,05
Threatening uterus rupture	4,30	188	6,50	287	<0,05
No consent to vaginal labor in patients post caesarean section	Indication since 2008		11,60	419	-
Threatening eclampsia	4,20	119	3,10	128	<0,05
Twin pregnancy	2,30	65	4,83	198	<0,05
Significant obstetric history	0,90	25	0,60	23	>0,05
Extra-obstetric indications*	7,44	211	7,35	425	>0,05
Other**	16,76	168	7,65	167	<0,05
Total	100	2833	100	4082	<0,05

* Extra-obstetric indications: ophthalmologic indications, maternal internal conditions, cardiac indications, orthopedic indications. ** Other: threatening intrauterine infection, abnormal fetal lie, obstructing uterine myomas, cervical cancer, abdominal tumors, genital warts, fetal defects, umbilical cord prolapse, status post myomectomy

and their contribution in the tested time periods, i.e. in 2002–2007 and 2008–2014.

In 2002–2007, the most frequent indication for a surgical delivery was threatening fetal asphyxia, which accounted for 25.6% of cases. The second and third positions were occupied by: abnormal fetal presentation, which constituted 18.5% of cases (breech presentation 13.4%, transverse and oblique lie 5.1%) and fetal head high straight bit 12%. Contributions greater than 3.5% belonged to: threatening uterus rupture (status post cesarean section, myomectomy or other procedures within the uterus), which constituted 4.3%, threatening eclampsia 4.2% and extra-obstetric maternal conditions 7.44%. The rarest indication was significant obstetric history 0.9%.

In 2008–2014, the most frequent indication for a surgical delivery was also threatening fetal asphyxia, which accounted for 27.9% of cases. The second most common indication was abnormal fetal lie 13.3% (breech position 9.7%, transverse and oblique lie 3.57%) and the third – status post cesarean section in patients who did not consent to vaginal labor, which accounted for 11.6% of all indications for a cesarean section. Fetal head high straight bit, cervical dystocia, threatening uterus rupture, preeclampsia, twin pregnancy, threatening eclampsia and extra-obstetric complications constituted from 3.1% to 7.6% of indications. The rarest indications were: significant obstetric history 0.6%, cephalopelvic disproportion 2.7% and placental pathology 2.1%.

The number of cesarean sections conducted after a prior surgical delivery increased in 2008–2014 mainly due to the inclusion of an additional indication, i.e. the lack of patient consent

to vaginal labor, which constituted 11.6%, and due to threatening uterus rupture with rates increasing from 4.3% in 2002–2007 to 6.5% in 2008–2014 ($p < 0.05$). Moreover, the number of cesarean sections conducted to deliver twins increased from 2.3% to 4.86% ($p < 0.05$), which is probably associated with increasing number of pregnancies resulting from assisted reproductive technology.

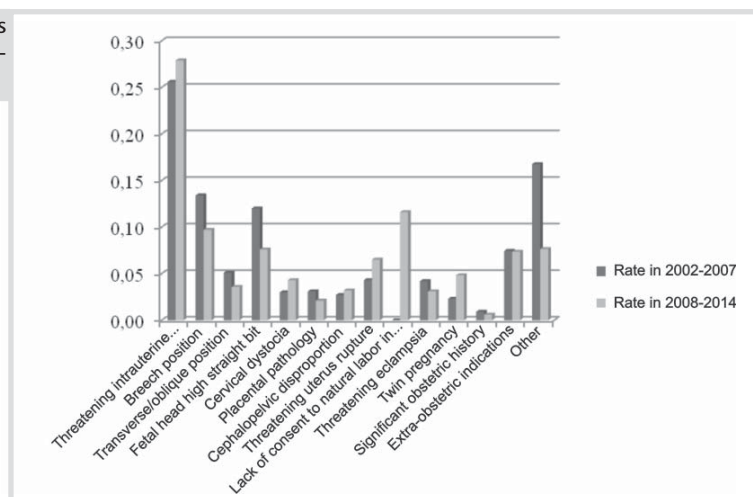
DISCUSSION

In the analyzed time periods, 2002–2007 and 2008–2014, the percentage of performed caesarean sections increased from 31.2% to 40.7%. Similar gradually increasing rates have also been reported in the literature. Mittal S. et al., from an Indian center, demonstrated an increasing cesarean section rate in 2001–2011 from 17.15% to 28.93% [6]. Stasieluk A. et al. reported increasing frequency of cesarean sections from 30.1% in 2000–2001 to 39.2% in 2010 [5]. Troszyński M. analyzed Polish data from 1999–2009 and found that the cesarean section rate amounted to 19.5% in 2000 and increased to 32% in 2009, also in tertiary referral centers where the rate increased from 30.5% in 2000 to 40.9% in 2009 [9].

In our material, the most frequent indication for a surgical delivery was threatening fetal asphyxia in both time periods. Similar data can be found in other studies where the contribution of this indication ranges from 18% to 44.2% [11,12].

In our material, failure to progress, comprising cervical dystocia, fetal head high straight bit and cephalopelvic disproportion, constituted 17.7% of causes for cesarean section in

Fig. 1. A comparison of indications for the caesarean sections in 2002–2007 and in 2008–2014



2002–2007 and 15.1% in 2008–2014. A similar rate, ranging from 9.3% to 30.7%, has been observed by others [13,14].

Breech position in a nulliparous woman was a frequent indication for a cesarean section in both analyzed periods. It reached 13.4% and 9.7%, respectively. The percentage of this indication ranges from 7.7% to 20.5% in the literature [11,12].

In the analyzed material, the proportion of caesarean sections to deliver twins more than doubled: from 2.3% to 4.8%. Other authors also report a gradual rise in the number of cesarean sections performed due to multiple pregnancies, which accounted for 1.41% of cases in 2001, 1.69% in 2006 and 2.06% in 2011 [6]. This increase can be probably explained by greater prevalence of infertility and development of assisted reproductive technology, which is a frequent cause of twin pregnancies. According to Stasieluk et al. 6% of cesarean sections are conducted in patients after infertility treatment [5].

Threatening uterus rupture after prior cesarean section as an indication to another surgical delivery was noted in 4.3% and 6.5% of cases for both tested time periods, respectively. In the literature, this rate ranges from 6–30% [14–15].

The Polish Gynecologic Society updated indications to cesarean section in 2008. Vagi-

nal delivery is possible in women post cesarean section provided that certain conditions are met and the patient agrees to natural labor. In 2008–2014, this was the second most common indication to cesarean section and accounted for 11.6% of all indications. It must be emphasized that the lack of consent to vaginal delivery is the most common indication for surgical delivery in numerous centers [9,16,17], which considerably increases the overall cesarean section rate.

CONCLUSIONS

1. In time periods 2002–2007 and 2008–2014, the percentage of performed caesarean sections increased in a statistically significant way from 31.2% to 40.7%.
2. Threatening fetal asphyxia continues to be the most frequent indication.
3. The lack of consent to natural labor in patients who had previously undergone cesarean section was a new indication that occupied the third place among the most frequent indications for a surgical delivery in 2008–2014.
4. A statistically significant increase in the number of twin pregnancies as a result of assisted reproductive technology affects cesarean section rates.

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