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Wpływ elektywnego cięcia cesarskiego na stan urodzeniowy noworodka w punktacji skali Apgar

Streszczenie

Wstęp. Przez ostatnie lata zauważalna jest na całym świecie tendencja zwyżkowa wykonywania cięć cesarskich. W naszym kraju liczba cięć również przekroczyła już dawno zalecane 15%. Przyczyny są wieloczynnikowe i złożone, od aspektów etycznych i liberalizacji wskazań po dążenie samych ciężarnych do wykonania cięć na życzenie.

Cel. Celem pracy było porównanie pourodzeniowego stanu noworodków z porodów pochwowych z noworodkami z cięć cesarskich. Założeniem było uzyskanie przez noworodki z porodów naturalnych lepszej punktacji w skali Apgar niż u noworodków z cięcia cesarskiego.

Materiał i metody. Porównano statystycznie punktację w skali Apgar w 1 i 10 minucie życia u 150 noworodków z porodów pochwowych ze 150 noworodkami z cięć cesarskich elektywnych.

Wyniki. Noworodki urodzone siłami natury otrzymały statystycznie lepsze wyniki w ocenie w skali Apgar, w pierwszej minucie życia, w porównaniu z noworodkami z cięć cesarskich. W 10 minucie życia nie stwierdzono statystycznie istotnych różnic w ocenie w skali Apgar pomiędzy obiema badanymi grupami.

Wnioski. Wyniki pokazują, iż w przypadkach, gdy życiu matki i dziecka nie zagraża niebezpieczeństwo, lepszym sposobem zakończenia ciąży jest poród siłami natury.

Słowa kluczowe: cięcie cesarskie elektywne, poród pochwowy, skala Apgar.

The influence of elective cesarean section on Apgar score

Abstract

Introduction. Over the past years an upward tendency to perform caesarean operations has been noticed all over the world. In our country, the number of these surgical interventions has also exceeded the recommended 15% a long time ago. Complex and multifactorial causes of this situation range from ethical aspects through a more liberal approach towards the implications for caesarean section to an increased number of caesarean sections done at the mother's request

Aim. This paper is aimed at analyzing the afterbirth condition of newborn babies born by caesarean section and at comparing their condition with that of babies born by vaginal birth. The assumption was to obtain better Apgar scores by babies born by vaginal birth in comparison with babies born by caesarian section.

Material and methods. This paper contains a statistical comparison of Apgar scores measured in the first and the tenth minute of a newborn's life. The research compares 150 cases of babies born by vaginal birth and selected 150 babies born by caesarean section.

Results. The babies born naturally had better Apgar scores in the first minute of their life in comparison to babies born by caesarean. In the tenth minute of their life a statistical difference between the two groups was not maintained.

Conclusions. The findings show that in cases of unthreatened pregnancies the better solution is to terminate pregnancy by natural birth.

Keywords: elective cesarean section, vaginal birth, Apgar score.

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INTRODUCTION

Recently the percentage of cesarean sections performed is constantly growing not only in Poland but also all over the world. Nowadays ¼ of children are delivered by cesarean section in many places of the world [1]. According to WHO document elaborated in 1985 no geographic regions should have a cesarean section percentage higher than 10-15% [2]. The percentage in Poland has already crossed the recommended norm. Since 1994 the number is still growing – from 13.8% in 1994 to 18.1% in 1999 and 21.1% in 2001 [3]. The numbers are increasing but "(...) the fact is being ignored that cesarean section, despite huge progress in medicine, is still a risky intervention that brings many intra- and postoperative threats that are not discussed in statistical research" [4].

The problem is complicated and multifactorial. On the one hand, the opinion of obstetricians and lawyers in Poland is quite clear. According to article 160 § 2 of the Penal Code, any surgical intervention performed without medical necessity and that exposes the patient's life or health to risk is considered a crime. Theoretically a "cesarean section at the mother's request" does not exist [5]. But many times women force doctors to perform it because they are afraid of pain or irreversible changes in their bodies after a natural birth. On the other hand, progress in peri- and neonatology brought about an evolution of the cesarean section indications. Doctors do not use "firm frames" anymore because the indications to perform cesarean section can be interpreted differently.

It is estimated that 6-50% of all cesarean sections performed are interventions that are not necessary from the medical point of view [6]. Are we aware of the long-term consequences of this operation (for both mother and newborn) performed, in some cases, even repeatedly?

AIM

The main purpose of this article is the comparison of newborns' status born by vaginal labour with that of newborns born by cesarean section. What is going to be compared is the Apgar score obtained by the newborn babies in the first and tenth minute after the birth. By this comparison we would like to find the reference point for the theory that can lately be found in scientific literature that claims that cesarean section should be only considered a lifesaving procedure in unexpected situations and should not be a standard intervention that will replace natural birth in the future.

MATERIAL AND METHODS

The research was carried out in Wrocław Public Hospital no.1. Studied material included specialized literature and newborns disease history collected between 23.02.2010 and 26.06.2010. There were 300 newborns evaluated. The newborns have been divided into two groups:

- Group 1 – babies born in a natural way (n=150),
- Gruop 2 – babies born by cesarean section (n=150).

In the group of 150 newborns delivered by cesarean section (including one pair of twins) we excluded the interventions performed in unexpected cases (premature placenta abruption, intrauterine fetal asphyxia, pulse abnormalities, lack of labour progress).

There were elective cesarean sections chosen with the following indications: ophthalmic indications, orthopedic indications, post-cesarean section state (including one case of seven cesareans), mother-fetus disproportion (diagnosed before the delivery had started), breech, diabetes, pregnancy induced hypertension (pre-eclampsia state excluded), neurological indications, state after miomectomy, HPV infections, uteral or pelvis pathologies. Newborns included in the study born before 37 Hbd have not been assumed as premature newborns.

For the comparison, there was a control group of 150 newborns formed. All of them have been delivered in a natural way, and oxitocin-induced labours and premature ones were excluded. Newborns included in the study born before 38 Hbd were not assumed as having been premature. The recollected data are: weeks of the pregnancy in which the delivery took place, body mass in grams, Apgar score and – in the case of cesarean section – indications. Newborns were divided into groups, depending on the week of the pregnancy termination, mass and Apgar score. Mothers were divided in function of the parity. Results of this chapter can be found in the Figure 1,2,3 and 4.

The Figure 2 analysis shows that the most numerous group consisted of newborns born in the 39th week of pregnancy. They constitute 44% of whole population. Next 15% consists of babies born in 38 Hbd. In the 40th week of pregnancy there was 17% of babies born. The smallest number (less than 10%) represents the newborns born before 38 Hbd and the newborns from pregnancies finished after 40 Hbd – 5%.

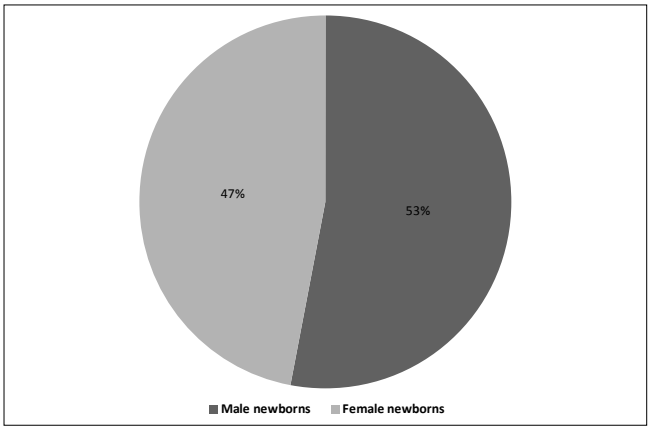

FIGURE 1. Newborns division according to sex.

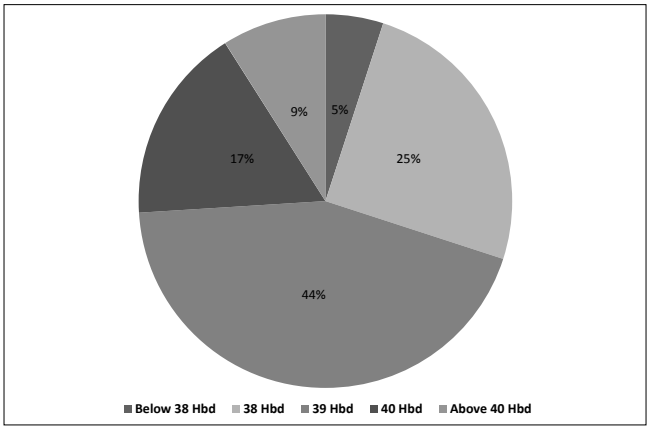

FIGURE 2. Newborns division based on the week of pregnancy termination.

The most numerous group on the graph above constitute the newborns between 3001 g and 3500 g and it was almost the half of the whole group studied – 45%. And 32% are newborns with the body mass between 3,001 g and 4,000 g. The group of babies of 2,300-3,000 g constitutes 16%, and the newborns of 4,001-4,500 g gives only 6%. The smallest group is built by babies that weigh more than 4,500 g – 1% (Figure 3).

The graph shows that the majority of mothers are women who have already delivered 57%, and there was 43% of primiparous women (Figure 4).

The statistical comparison was made using Statistica 9,0 PL Statsoft Inc. (2009). The results were analysed using the Statistica 9,0 PL Statsoft Inc. (2009) programme. The significance of differences was estimated by t-student test, and the significance level of $p<0.05$ was assumed. The results are shown in the Table 1.

RESULTS

There were 150 newborns born by cesarean section (group no 2) and 150 newborns born in a natural way (group no 1) compared. The lower scores were generally caused by skin discoloration, muscular tension and reflex deficiencies.

In the first group there was only one newborn who scored 7 points in the first minute of life. It was the lowest score obtained in both groups. One hundred and twenty four newborns from the second group and 137 newborns of the first one obtained the score of 10 points in the first minute of their lives. The results are shown in the Figure 5. The graph shows the state of the newborns delivered by cesarean section and the newborns delivered in a natural way evaluated in Apgar scale. In the first minute of life the average score of naturally born babies was 9.86 points, and in the 10th minute it was 9.92 points. Newborns delivered by cesarean section obtained 9.70 points in the first minute and 9.84 points in the 10th minute of life.

Result marked in red shows a significant statistical difference between Apgar scores of naturally born babies and those born by cesarean section. The scores obtained in the tenth minute of life did not show any significant statistical differences.

The next comparison was made based on the week of pregnancy termination in the natural deliveries and cesarean sections. The first criterion of the study was the Apgar score in the first minute of life. The newborns were divided into 3 groups: <38,38 Hbd, 39 Hbd, 40> Hbd (Figure 6 and 7).

The second criterion of the study was the Apgar score obtained by the newborns in the tenth minute of life. The newborns were divided into 3 groups: <38, 38 Hbd, 39 Hbd, 40, >40 Hbd (Figure 8 and 9).

Statistical comparison showed that the naturally delivered babies born before and during the 38th week of life in both the first and tenth minute of life obtained better Apgar scores than the newborns delivered by cesarean section. In the groups of 39, 49 and >40 Hbd there were no significant differences observed.

The next step was to analyze the relationship between the newborns' sex and the Apgar score obtained in the first and tenth minute of life. The results are shown in the Figure 10, 11 and 12, 13. The newborns were divided into two groups: female newborns and male newborns.

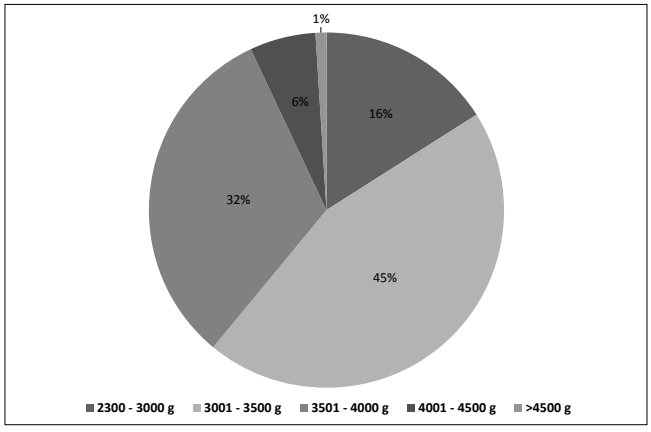

FIGURE 3. Newborns division on the basis of the body mass.

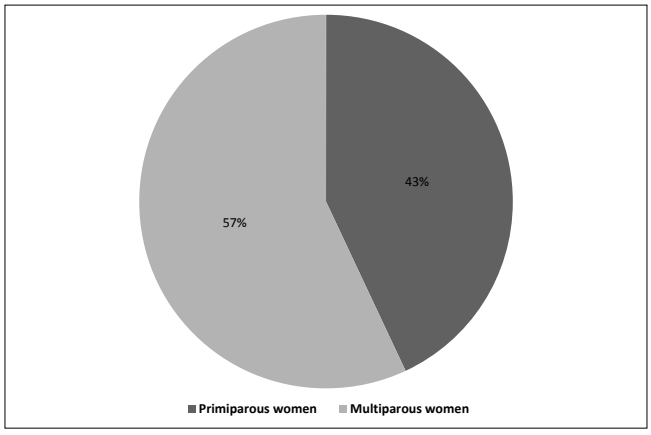

FIGURE 4 Mothers division based on parity.

TABLE 1. Statistical comparison of study results.

	1			2	
Mean 1	Number of newborns examined 1	Standard deviation 1	Mean 2	Number of newborns examined 2	Standard deviation 2
9.866667	150	0.472984	9.700000	150	0.721203
9.920000	150	0.317710	9.840000	150	0.464585

Mean 1 – average Apgar score in natural labours in the first and the tenth minute of life.
Mean 2 – average Apgar score in cesarean section labours in the first and the tenth minute of life number of newborns examined.
p – significance factor ($p<0.05$).

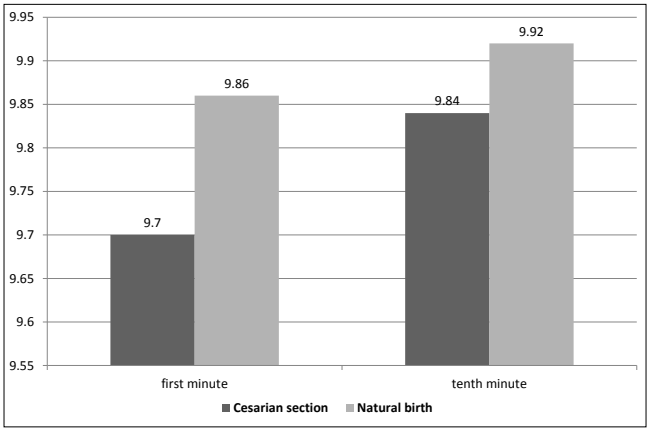

FIGURE 5. State of the newborns delivered by cesarean section and the newborns delivered in a natural way evaluated on the Apgar scale.

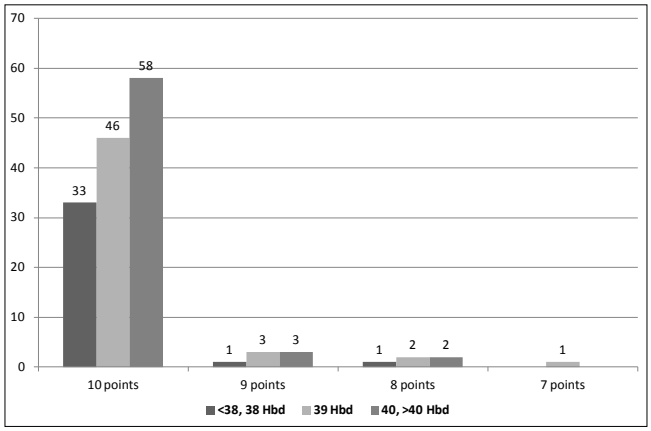

FIGURE 6. Relationship between the Apgar score obtained in the first minute of life by naturally born babies and the week of pregnancy termination.

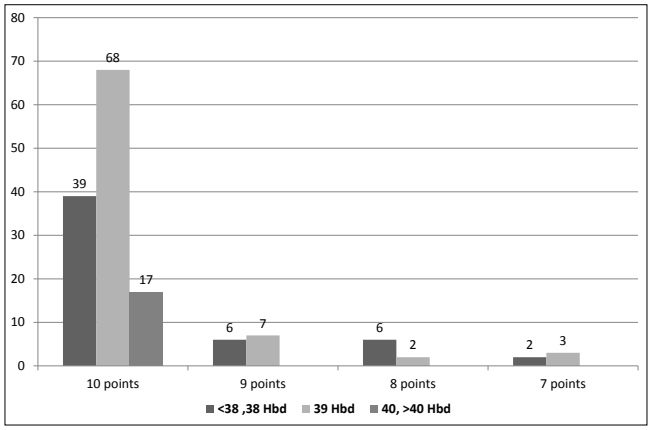

FIGURE 7. Relationship between the Apgar score obtained in the first minute of life by babies born by cesarean section and the week of pregnancy termination.

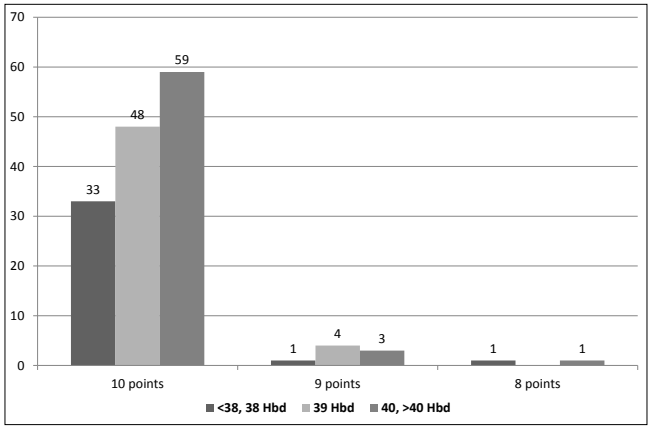

FIGURE 8. Relationship between the Apgar score obtained in the tenth minute of life by naturally born babies and the week of pregnancy termination.

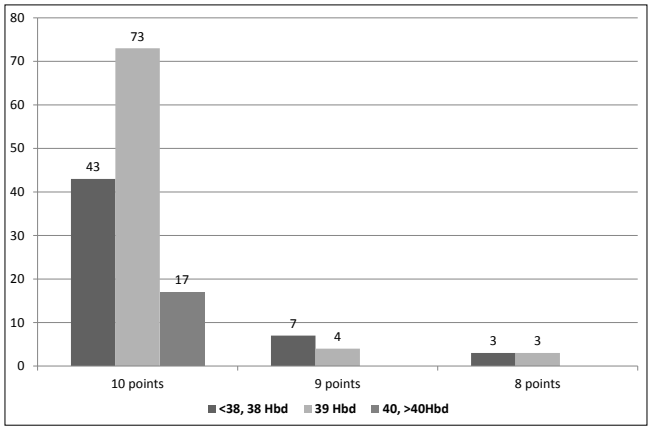

FIGURE 9. Relationship between the Apgar score obtained in the tenth minute of life by babies born by cesarean section and the week of pregnancy termination.

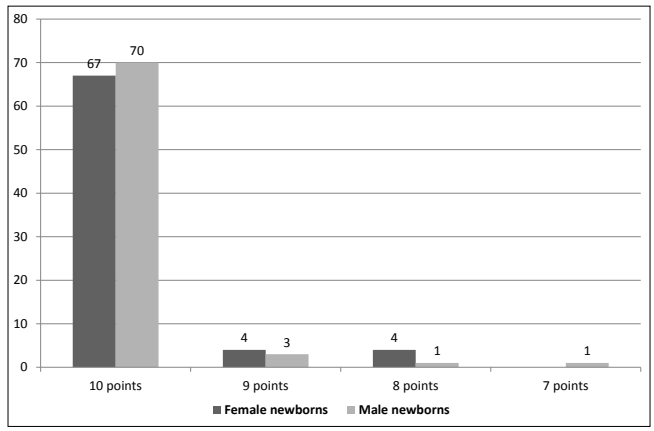

FIGURE 10. Relationship between the sex of the newborn and its Apgar score in the first minute of life – natural labours.

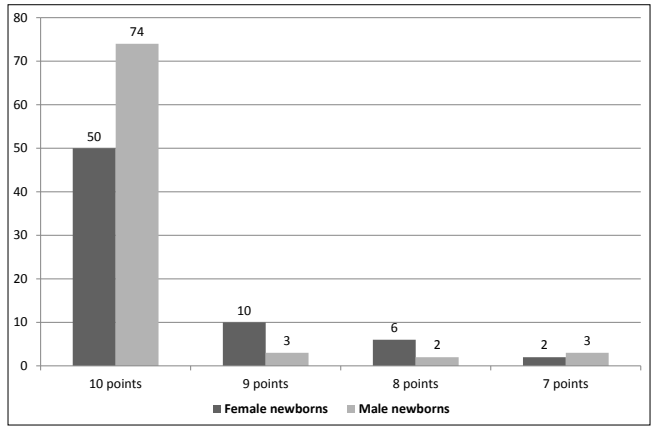

FIGURE 11. Relationship between the sex of the newborn and its Apgar score in the first minute of life – cesarean sections.

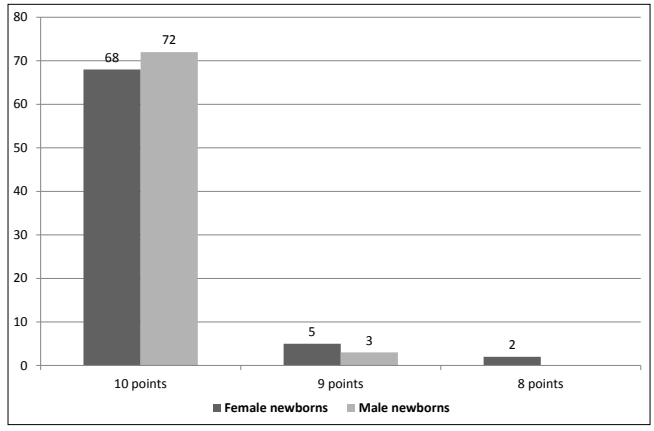

FIGURE 12. Relationship between the sex of the newborn and its Apgar score in the tenth minute of life – natural labours.

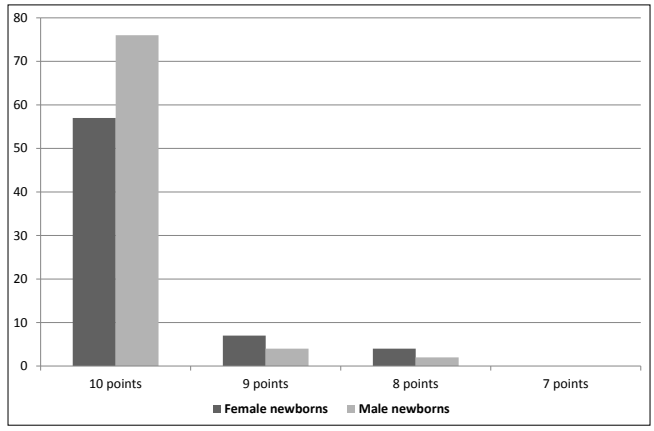

FIGURE 13. Relationship between the sex of the newborn and its Apgar score in the tenth minute of life – s sections.

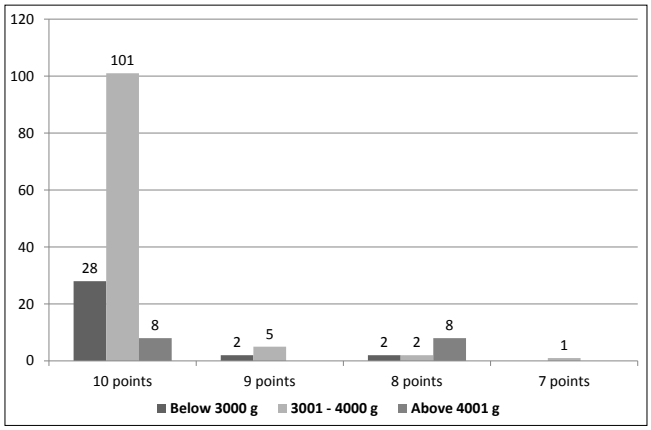

FIGURE 14. Relationship between the Apgar score in the first minute of life and the newborns body mass – natural labours.

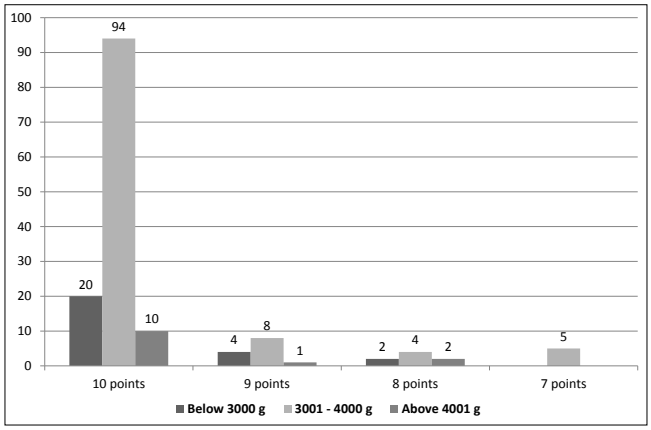

FIGURE 15. Relationship between the Apgar score in the first minute of life and the newborns body mass – cesarean section.

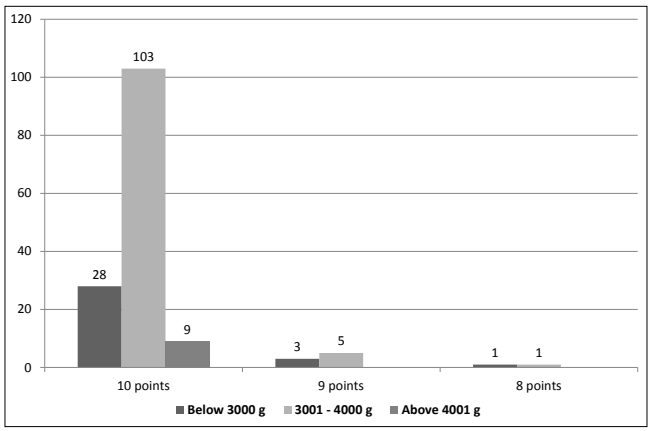

FIGURE 16. Relationship between the Apgar score in the tenth minute of life and the newborns body mass – natural labours.

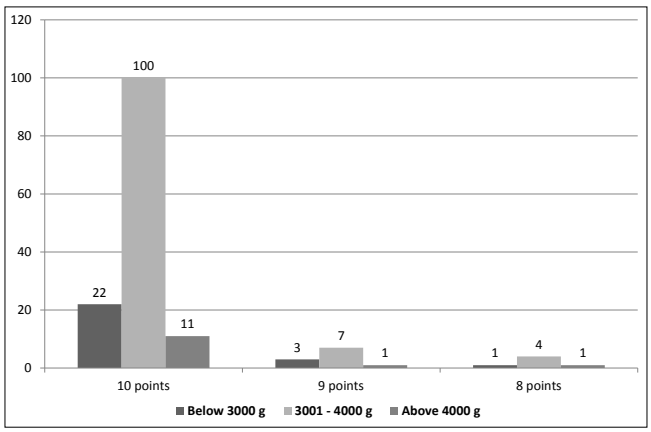

FIGURE 17. Relationship between the Apgar score in the tenth minute of life and the newborns body mass – cesarean section.

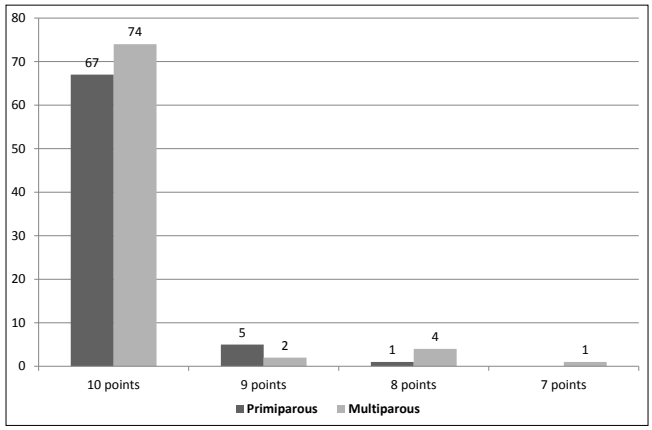

FIGURE 18. Relationship between the Apgar score obtained in the first minute of life and woman parity – natural labours.

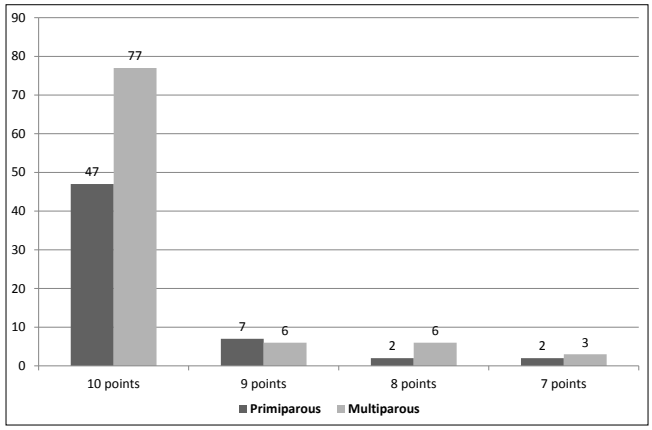

FIGURE 19. Relationship between the Apgar score obtained in the first minute of life and woman parity – cesarean sections.

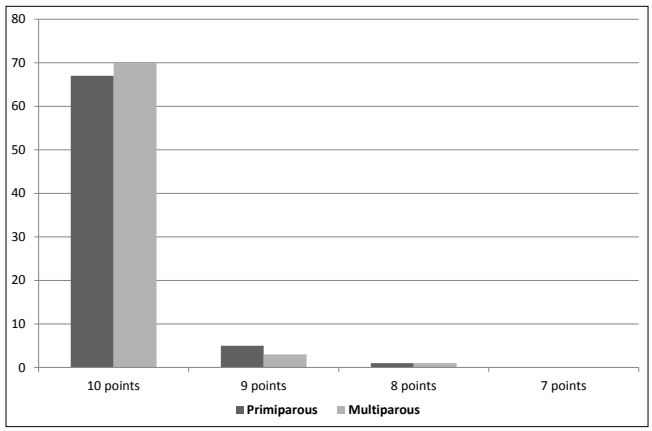

FIGURE 20. Relationship between the Apgar score obtained in the tenth minute of life and woman parity – natural labours.

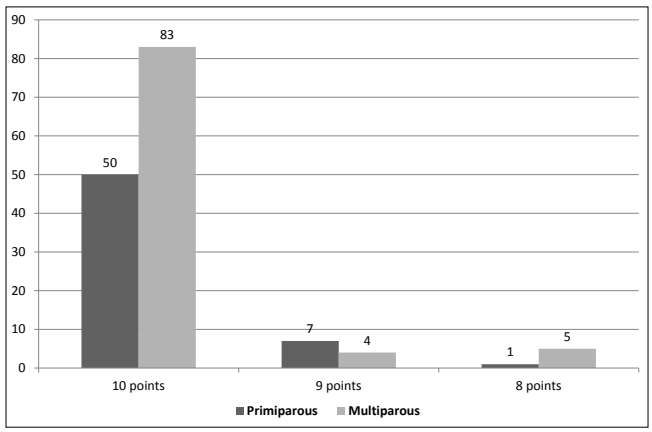

FIGURE 21. Relationship between the Apgar score obtained in the tenth minute of life and woman parity – cesarean sections.

The results were as follows: in the group of female newborns the Apgar score in the first minute of life was significantly higher in the naturally born babies. In the rest of examined groups there were no statistically significant differences observed.

Afterwards we made a comparison of the newborns' mass and their Apgar scores in the first and tenth minute of life. The first criterion studied was the Apgar score in the first minute of life. Babies were divided into 3 groups: below 3,000 g, 3,001-4,000 g, over 4,001 g.

Results are shown in the Figure 14 and 15.

The second criterion was the Apgar score obtained in the tenth minute of life. There were 3 groups: below 3,000 g, 3,001-4,000 g, over 4,001 g.

Results are shown in the Figure 16 and 17.

The results were as follows: In the group of newborns born by natural labour with a body mass of between 3,001 and 4,000 g, the Apgar score in the first minute of life was significantly higher than in the babies delivered by cesarean section. In the rest of examined groups there were no statistically significant differences observed.

The last relationship studied was the proportion of Apgar score and women parity. The first criterion was the Apgar score obtained in the first minute of life. Examined women were divided into two groups: primiparous and multiparous.

Results are shown in the Figure 18 and 19.

The next criterion was the Apgar score obtained in the tenth minute of life. Examined women were divided into two groups: primiparous and multiparous.

Results are shown in the Figure 20 and 21.

The results show that primiparous women who decided to deliver naturally gave birth to children with higher Apgar score in their first minute of life than the newborns delivered by cesarean section.

The difference in the Apgar score in the tenth minute of life in the group of primiparous women was not significant. In the group of multiparous women, the Apgar scores obtained in the first and tenth minute of life were not statistically important.

DISCUSSION

An increased rate of caesarean sections (CSs) has been observed in most parts of the developed countries during the last years. In Poland, the number of caesarean deliveries is similar in comparison to Western European countries. The main causes of this phenomenon are: (1) a liberalization of medical indications and (2) requests of pregnant women who often decide to become pregnant at 35 years of age and over. Another important factor is the very strong fear of vaginal labor (tocophobia), which was observed in approximately 20% of women. Taking into account this issue, gynecologists should reflect how the maternal emotional state as an ethical problem may affect the decision to execute CS without significant medical or obstetric indications.

Clinicians and patients should undertake a detailed discussion about the risks and benefits of CS versus vaginal delivery related to both maternal and infant outcomes. Intriguingly, it has been noted that in hospitals of a low and high degree of referentiality the percentage of CSs is similar. Further studies are needed to explain the causes of this phenomenon.

Views on the supposedly safer delivery by CS compared with the natural labor does not overlap with reports in the literature. According to some authors, the CS is correlated to a higher risk of neonatal mortality.

Kolas et al. examined neonatal outcomes among women with a planned cesarean and a planned vaginal delivery and their results showed that the CS is strongly associated with higher risk transfer to the neonatal intensive care unit and the risk of pulmonary disorders compared with a planned vaginal delivery. Interestingly, they did not observe any statistically significant relationships between the type of labor and the risk for low Apgar score [7]. Similar results were obtained by Fogelson et al. Moreover, Piec et al. revealed that distress occurred more frequently in neonates from CS than in infants from vaginal labor [8]. In turn, they did not show any significant relationships in the group of women with low obstetric risk between the risk for low Apgar score and type of delivery [9].

In this study, we observed a statistically significant correlation between the low mean Apgar score at first minute and cesarean section as a method of labor termination. Interestingly, comparison of the two methods of delivery in the context of mean Apgar score, showed no important significance (mean Apgar score for vaginal delivery: 9.84; and 9.92 for cesarean section).

CONCLUSIONS

The study shows that newborns delivered in a natural way obtain better scores on the Apgar scale in the first minute of their lives than newborns delivered by cesarean section without contractions. The result speaks in favour of natural birth.

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