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DATABASE ANALYSIS

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Use and Effects of Augmentation of Labor with Oxytocin: A Single-Center, Retrospective, Case-Control Study of 4350 Women in Warsaw, Poland, 2015-2020

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Background: Although there have been some recent clinical trials on the effects of augmentation of labor with oxytocin, or augmentation of labor, there are no clinical guidelines to explain the variations in obstetric practice between countries and within countries. This retrospective case-control study from a single center in Warsaw, Poland aimed to evaluate the use and effects of augmentation of labor with oxytocin in 4350 women between 2015 and 2020.

Material/Methods: This was a single-center, retrospective, case-control study in which 29 455 cases were qualified for analysis. The study included the analysis of 2 groups: the study group consisted of 4382 patients who underwent stimulation of childbirth, and the control group consisted of 25 073 patients who did not undergo this obstetric procedure.

Results: Multivariate logistic regression analysis showed that the factors increasing the frequency of augmentation of labor were higher BMI ($P<0.05$), preinduction ($P<0.05$), epidural anesthesia ($P<0.05$), and family present at birth ($P<0.05$). Factors influencing reduction in the frequency of augmentation of labor were higher number of deliveries ($P<0.05$), vaginal birth after cesarean ($P<0.05$), and pre-pregnancy hypertension ($P<0.05$).

Conclusions: This study from a single center in Poland showed that BMI, preinduction, epidural anesthesia, and family present at birth significantly increased the frequency of labor stimulation with oxytocin. However, a history of previous pregnancies, previous cesarean sections, and pre-pregnancy hypertension significantly reduced the frequency of augmentation of labor with oxytocin.

Keywords: Oxytocin • Parturition • Risk Factors • Obstetric Labor Complications

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Background

Childbirth is a natural process during which the fetus and placenta are expelled due to uterine contractions [1]. Oxytocin makes the uterus contract and supports the progress of labor [2]. It is expected that every 1 h, the progress of childbirth will be 1 cm [3]. There are many natural methods that increase the effectiveness of contractions (intensify them), such as vertical positions or stimulation of the nipples [4,5]. However, if these methods do not bring the expected effect, pharmacological methods are used to intensify the contractile activity of the uterus. Exogenous oxytocin infusion is used in standard clinical practice to aid delivery [6,7].

A study from Nepal found that oxytocin treatment of prolonged labor can avoid the need for completion of labor by cesarean section. Although stimulation of labor is associated with better monitoring of fetal heart and contractile uterine function, as well as shortening the first and second stage of labor and reduced need for cesarean section, its use may lead to an increased risk of unfavorable perinatal results [7].

According to the 2017 French guidelines, if a prolonged delivery in the first stage is found, an amniotomy should be performed first, and in the absence of improvement, oxytocin should be administered within 1 h [8]. The same recommendations were found in the European Guidelines for augmentation of labor [9]. However, widespread use of oxytocin during spontaneous labor must not be considered as simply another inoffensive prescription without any possible deleterious consequences for mother or fetus [8].

There have been reports that after administration of oxytocin, contractions become irregular, more frequent, longer and more painful, and can lead to hyperstimulation and impaired blood flow. This abnormal contraction pattern leads to increased levels of pain and stress in the mother [10]. Incorrect treatment with oxytocin, especially at high doses, may result in excessive uterine contraction and signs of fetal hypoxemia [11]. In addition, there are reports confirming that the use of oxytocin during childbirth appears to be an independent risk factor for severe PPH (postpartum hemorrhage) [8,12]. One study among Danish and Dutch hospitals showed that cessation of routine oxytocin augmentation led to a small increase in the incidence of cesarean section, but significantly reduced the risk of uterine hyperstimulation and abnormal fetal heart rhythm [13].

Although there is a lack of evidence-based clinical guidelines, the World Health Organization (WHO) recommends that augmentation of labor with oxytocin should only be used with a valid indication and a potential clinical benefit, and when the mother and fetus are closely monitored (eg, use of oxytocin alone for treatment of delay in labor is recommended) [11,14].

In Poland, based on data from the Supreme Chamber of Control (NIK; Najwyższa Izba Kontroli) from 2015, it was found that, on average, in 44% of patients whose documentation was inspected, oxytocin was used to stimulate childbirth [15]. In Poland, there are guidelines on induction of labor [16], while there are no guidelines on augmentation of uterine contractions with oxytocin. Differences in obstetric practice between countries and within countries generate the presence of various risk factors, causing an increase or decrease in the use of this procedure. Knowledge of these factors and comparing them between countries will optimize the quality of obstetric care, promote evidence-based medicine, and create clinical guidelines that take into account international diversity. Therefore, this retrospective, case-control study from a single center in Warsaw, Poland aimed to evaluate the use and effects of augmentation of labor with oxytocin in 4350 women between 2015 and 2020.

Material and Methods

Ethics Statement

Approval was given by the Bioethics Committee of the Medical University of Warsaw (No. AKBE/204/2021). This work is a part of a series of work in a larger project about perinatal care. Retrospective anonymized data analysis was conducted, thereby ensuring that no individual patient consent was necessary.

Study Design

This was a single-center, retrospective, cohort study. To ensure that the results were reported properly, the Strobe guidelines for case-control studies were used [17]. Electronic patient records from Saint Sophia's Hospital in Warsaw, Poland, which is a tertiary hospital that has the most deliveries per year both in the city of Warsaw and Mazowieckie Voivodeship (the largest and most populous of the 16 Polish provinces or voivodeships), were used for creating an anonymous, retrospective database of all the deliveries from January 1, 2015 to December 31, 2020. Electronic medical records were collected by the medical personnel to generate this dataset. As a result, no recall bias exists. In addition, the dataset was subjected to cross-checking for any inconsistencies, which were subsequently verified. The study included an analysis of 2 groups of patients at the time of delivery. The study group consisted of women who underwent augmentation of labor, and the control group consisted of patients who did not undergo this obstetric procedure. The analysis of the data included information on single deliveries, in patients at term of delivery, who received pharmacological augmentation of labor by an infusion of 5 IU of oxytocin in an infusion pump. The dose schedule of oxytocin is in accordance with the recommendations of the Polish Society of

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Table 1. Characteristics of the population.

Variables	Study group Augmentation of labor n=4382	Control group No augmentation of labor n=25073	All n=29455	p-value
Age [years] – M (SD)	30.5 (4.1)	31.8 (4.3)	31.57 (4.3)	<0.0001
Place of residence – n (%)				0.078
City	3828 (87.4)	21656 (86.4)	25484 (86.5)	
Village	554 (12.6)	3417 (13.6)	3971 (13.5)	
Education – n (%)				0.202
Primary education	77 (1.8)	406 (1.6)	483 (1.6)	
Secondary education	504 (11.5)	2676 (10.7)	3180 (10.8)	
Higher education	3801 (86.7)	21991 (87.7)	25792 (87.6)	
Marital status – n (%)				<0.0001
In a relationship	3384 (77.2)	20535 (81.9)	23919 (81.2)	
Single	998 (22.8)	4538 (18.1)	5536 (18.8)	
BMI – M (SD)	27.39 (3.5)	27.06 (3.7)	27.12 (3.6)	<0.0001
Maternal smoking – n (%)				0.741
Yes	18 (0.4)	112 (0.4)	130 (0.4)	
No	4364 (99.6)	24961 (99.6)	29325 (99.6)	

SD – standard deviation; BMI – body mass index.

Gynecologists and Obstetricians [16]. In the process of electronic analysis of the documentation, the following information was obtained: demographic data of women, obstetric history, course and complications of pregnancy, data on the course of delivery, and birth data of the child. The criteria for exclusion from the study, both from the study group (augmentation of labor) and from the control group (lack of augmentation of labor), were multiple pregnancy (N=595), childbirth below 38 weeks of pregnancy (N=4800), lack of data in the electronic documentation (N=4219), stillbirth (N=13), neonates with major birth defects (N=877), or abnormal karyotype (N=48). Documentation covering 40 007 deliveries was analyzed, of which, based on the adopted criteria, 29 455 cases were qualified for analysis, including the study group of 4382 and the control group of 25 073.

Statistical Analysis

The collected data were subjected to statistical analysis using STATISTICA software version 13.2 (Tibco Software, Inc., Palo Alto, CA, USA). The number and percentage were used to present qualitative data, and the mean and standard deviation were used for quantitative variables. The Kolmogorov-Smirnov test and the Lilliefors test were utilized to check the normality of the distribution of quantitative variables. The chi-square test was used to analyze the correlation between qualitative variables, and the Mann-Whitney U test was used to compare quantitative variables. A one-factor logistic regression analysis was conducted to identify the analyzed variables as potential risk factors for performing labor augmentation with oxytocin. Variables with $P<0.05$ were then included in the multivariate model of logistic regression analysis. The level of statistical significance was set at $P<0.05$.

Results

Augmentation of labor was more often used among younger women (30.5 vs 31.8), single ones (22.8% vs 18.1%), and with a higher BMI (body mass index) (27.4 vs 27.1), ($P<0.05$) (**Table 1**).

Augmentation of labor was more often used in women who had had fewer pregnancies (1.5 vs 2.1) and deliveries in the past (1.3 vs 1.8). However, it was less frequently performed in women diagnosed with gestational diabetes (7.1% vs 9.7%), pregnancy hypertension (2.1% vs 2.85), and pre-pregnancy hypertension (0.3% vs 0.8%). These correlations were statistically significant ($P<0.05$), and the detailed data are presented in **Table 2**.

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Table 2. Selected pre-stimulation maternal factors.

Variables	Study group Augmentation of labor n=4382	Control group No augmentation of labor n=25073	All n=29455	p-value
Number of pregnancies – M (SD)	1.5 (0.9)	2.1 (1.2)	1.99 (1.1)	<0.0001
Number of deliveries – M (SD)	1.3 (0.7)	1.8 (0.9)	1.7 (0.9)	<0.0001
Gestational diabetes – n (%)				
Yes	312 (7.1)	2421 (9.7)	2733 (9.3)	<0.0001
No	4070 (92.9)	22652 (90.3)	26722 (90.7)	
Diabetes mellitus – n (%)				
Yes	8 (0.2)	35 (0.1)	43 (0.2)	0.492
No	4374 (99.8)	25038 (99.7)	29412 (99.8)	
Pregnancy hypertension – n (%)				
Yes	93 (2.1)	701 (2.8)	794 (2.7)	0.011
No	4289 (97.9)	24372 (97.2)	28661 (97.3)	
Pre-Pregnancy hypertension – n (%)				
Yes	15 (0.3)	194 (0.8)	209 (0.7)	0.002
No	4367 (99.7)	24879 (99.2)	29246 (99.3)	
Pregnancy cholestasis – n (%)				
Yes	23 (0.5)	116 (0.5)	139 (0.5)	0.579
No	4359 (99.5)	24957 (99.5)	29316 (99.5)	

SD – standard deviation.

Augmentation of labor was more often performed in women who had not had a cesarean section in the past (93.8% vs 83.6%). In addition, augmentation of labor was more often performed in women who had a preinduction of labor (Foley catheter, amniotomy) (2.8% vs 1.7%) and epidural anesthesia (64.1% vs 22.8%). As a result of the use of augmentation of labor, the occurrence of perineal laceration was less frequent (20.0% vs 25.7%), while perineal incision was more often performed (45.9% vs 17.8). Augmentation of labor was more often used in the case of family birth (birth in which a person accompanying the childbirth participates, usually a husband, a partner of the patient, or another selected person) (32.9% vs 26.3%). As a result of pharmacological augmentation of labor, it more often ended with natural birth (physiological – 79.2% vs 69.7%; operative – 6.0% vs 1.1%). As a result of the use of augmentation of labor, a longer duration of 1st stage (376.9 vs 270.1 min) and 2nd stage (35.9 vs 23.7 min) of the delivery period, as well as the entire delivery (384.4 vs 233.8 min) and higher blood loss (415.7 vs 414.2 min), were more often found compared to the control group. In addition, because of pharmacological stimulation of labor, the Apgar score in neonates was more often below 7 points at the 1st minute (3.6% vs 1.4%) and 5th minute (0.6% vs 0.2%) after labor. Newborns of mothers who underwent labor stimulation were characterized by a higher birth weight (3521.4 vs 3504.4 g) and were longer (54.9 vs 54.8 cm). These correlations were statistically significant ($P<0.05$) (**Table 3**).

Table 4 presents a multivariate analysis of logistic regression of factors affecting the use of augmentation of labor. The analysis shows that the higher BMI (OR=1.02, 95%CI: 1.01-1.04, $P<0.05$), preinduction (OR=1.76, 95%CI: 1.13-2.74, $P<0.05$), epidural anesthesia (OR=4.01, 95%CI: 3.55-4.53, $P<0.05$), and family birth (OR=1.13, 95%CI: 1.01-1.27, $P<0.05$) increased the frequency of augmentation of labor. On the other hand, the higher number of deliveries (OR=0.43, 95%CI: 0.39-0.48, $P<0.05$), vaginal birth after cesarean (OR=0.48, 95%CI: 0.37-0.62, $P<0.05$), and the occurrence of pre-pregnancy hypertension (OR=0.09, 95%CI: 0.01-0.65, $P<0.05$) are factors influencing the reduction in the frequency of augmentation of labor.

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Table 3. Intrapartum and neonatal factors and augmentation of labor.

Variables	Study group Augmentation of labor n=4382		Control group No augmentation of labor n=25073		All n=29455		p-value
VBAC – n (%)							
Yes	273	(6.2)	4119	(16.4)	4392	(14.9)	<0.0001
No	4109	(93.8)	20954	(83.6)	25063	(85.1)	
Preinduction – n (%)							
Yes	125	(2.8)	416	(1.7)	541	(1.8)	<0.0001
No	4257	(97.2)	24657	(98.3)	28914	(98.2)	
Epidural analgesia – n (%)							
Yes	2810	(64.1)	5719	(22.8)	8529	(29.0)	<0.0001
No	1572	(35.9)	19354	(77.2)	20926	(71.0)	
Perineal laceration – n (%)							
Yes	876	(20.0)	6450	(25.7)	7326	(24.9)	<0.0001
No	3506	(80.0)	18623	(74.3)	22129	(75.1)	
Episiotomy – n (%)							
Yes	2012	(45.9)	4465	(17.8)	6477	(22.0)	<0.0001
No	2370	(54.1)	20608	(82.2)	22978	(78.0)	
Family birth – n (%)							
Yes	1443	(32.9)	6588	(26.3)	8031	(27.3)	<0.0001
No	2939	(67.1)	18485	(73.7)	21424	(72.7)	
Type of delivery – n (%)							
Physiological	3470	(79.2)	17467	(69.7)	20937	(71.1)	<0.0001
C-section	650	(14.8)	7242	(28.2)	7892	(26.8)	
Operative	262	(6.0)	364	(1.1)	626	(2.1)	
Duration of 1st stage [min] – M (SD)	376.9	(156.9)	270.1	(126.8)	288.8	(138.6)	<0.0001
Duration of 2nd stage [min] – M (SD)	35.9	(19.5)	23.7	(16.8)	25.7	(17.8)	<0.0001
Duration of 3rd stage [min] – M (SD)	11.3	(3.0)	11.1	(3.6)	11.1	(3.7)	0.063
Duration of delivery [min] – M (SD)	384.4	(200.9)	233.8	(172.9)	257.0	(185.8)	<0.0001
Blood loss [ml] – M (SD*)	415.7	(100.7)	414.2	(97.0)	414.4	(98.4)	0.046
Apgar 1' – n (%)							
>7	159	(3.6)	355	(1.4)	514	(1.8)	<0.0001
≤7	4223	(96.4)	24718	(98.6)	28941	(98.2)	
Apgar 5' – n (%)							
>7	25	(0.6)	53	(0.2)	78	(0.3)	<0.0001
≤7	4357	(99.4)	25020	(99.8)	29377	(99.7)	
Birth weight M (SD)	3521.4	(392.6)	3504.4	(412.6)	3506.9	(409.7)	0.005
Length – M (SD)	54.9	(2.4)	54.8	(2.4)	54.8	(2.4)	0.010

SD – standard deviation; VBAC – vaginal birth after cesarean.

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Table 4. Multivariate logistic regression analysis of factors affecting the performance of augmentation of labor.

Variable	Multivariate logistic regression					
	B	SE	Wald	p-value	OR	95% CI
BMI	0.023	0.008	7.925	0.005	1.02	1.01-1.04
Parity	-0.842	0.056	229.384	<0.0001	0.43	0.39-0.48
Pregnancy hypertension (yes)	-2.438	1.026	5.643	0.018	0.09	0.01-0.65
VBAC (yes)	-0.739	0.134	30.445	<0.000	0.48	0.37-0.62
Preinduction (yes)	0.566	0.225	6.307	0.012	1.76	1.13-2.74
Epidural anesthesia (yes)	1.388	0.062	499.578	<0.0001	4.01	3.55-4.53
Family birth (yes)	0.125	0.060	4.391	0.036	1.13	1.01-1.27

BMI – body mass index; VBAC – vaginal birth after cesarean.

Discussion

This study from a single center in Poland showed that a higher BMI, preinduction, epidural anesthesia, and family birth increase the frequency of pharmacological augmentation of labor. However, higher number of deliveries, vaginal birth after cesarean, and pre-pregnancy hypertension are factors influencing the reduced frequency of augmentation of labor.

Referring to our own research, it was found that BMI is significantly higher in the group of patients whose uterine contractions were stimulated by oxytocin. The impaired contractility of the uterine muscle and its response to oxytocin used in stimulation is associated with obesity [18]. Isgren et al noted that with increasing BMI, the dose of oxytocin increases during the stimulation of uterine contractions during labor [19].

Continuing our own research, we analyzed the correlation between the number of interventions used, such as preinduction and epidural anesthesia, and the augmentation of labor. It was found that both preinduction and epidural analgesia were more frequently performed in the group of patients whose uterine contractions were stimulated by oxytocin. An in-depth analysis of preinduction conducted by Mlodawski et al shows that women treated with misoprostol less frequently required stimulation with oxytocin during labor compared to women who were treated with a Foley catheter [20]. French researchers Girault et al showed that the determinants of abuse of augmentation of labor were, among others, epidural anesthesia [21]. Baranowska et al observed a correlation between the average cumulative dose of oxytocin administered during labor and the use of epidural anesthesia [22]. Other researchers came to similar conclusions, both in terms of more frequent use of oxytocin after the start of epidural anesthesia [23,24] and more frequent use of epidural anesthesia after the augmentation of labor with oxytocin [25,26]. To some extent, this can be explained by more painful contractions that are stimulated by oxytocin and movement limitations caused by the required continuous CTG recording during the stimulation of uterine contractions [22].

The psychological aspect in the context of augmentation of labor was also analyzed. In our study, it was noted that the number of family births (the woman was accompanied by a companion during labor) was significantly higher in the group of patients who were stimulated with oxytocin. Bergström et al stated that the use of psychoprophylaxis during childbirth increases the risk of stimulation [27]. Wang et al showed no difference between those women giving birth with companions and those giving birth under routine hospital care in China [28].

The results of our own research showed a significantly higher average number of deliveries and pregnancies in the medical history in the group of patients whose uterine contractions were not stimulated by oxytocin. Research by Litorp et al (2020) in Nepal showed that women whose labor was stimulated by oxytocin more often gave birth to the first child [7]. Studies by Selin et al showed that oxytocin was used much more often in primiparas than in multiparous women for augmentation of labor [29].

The present study showed that in the group of women who had not had any cesarean section in their medical history, labor was significantly more often stimulated. The American College of Obstetricians and Gynecologists (ACOG) found no contraindications to the use of oxytocin for induction or augmentation of labor in the case of TOLAC (trial of labor after cesarean section) [30,31]. Variables that increased the likelihood of VBAC (vaginal birth after cesarean section) were maternal height and previous natural birth, while these odds decreased significantly with maternal age, maternal BMI, induction of labor, increased dose of oxytocin, and epidural anesthesia. Therefore, prolonged oxytocin stimulation should only be used if the likelihood of safe natural delivery is high – the percentage of

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successful VBACs decreased significantly among women who had been stimulated for more than 4 hours by oxytocin during delivery [32]. Perhaps that is why the European Guidelines on augmentation of labor recommend that oxytocin for augmentation of labor should not be started when there is a previous scar on the body of the uterus (previous classical cesarean section) [9]. Our study showed that the number of patients with both pregnancy hypertension and pre-pregnancy hypertension is significantly higher among women who were not stimulated with oxytocin. Litorp et al (2020) found that the number of patients with hypertensive disorders is also higher in women who did not undergo stimulation [7].

The present study found that women giving birth whose delivery was stimulated by oxytocin are younger than those whose delivery was spontaneous. Research by Litorp et al (2020) also showed that women who had stimulated labor were more often younger [7]. However, in a study conducted by Baranowska et al (2021), there was no statistically significant correlation between the administered dose of oxytocin and the age of the mother [22].

The rate of operative delivery in the context of the augmentation of labor with oxytocin was also analyzed in our study. It was noted that the number of operative deliveries was significantly higher in the group of patients whose birth was stimulated by oxytocin. Litorp et al noted that women who had an augmentation of labor had a higher risk of operative delivery [7]. Espada-Trespalacios et al proved that the use of stimulation during childbirth in women at low risk increases the risk of operative delivery [33].

We found that the number of cesarean sections was significantly lower among patients with stimulated uterine contractions. Similar conclusions were reached by Litorp et al, who concluded that stimulation with oxytocin during delivery is associated with a reduction in the risk of cesarean section [7]. Different results were obtained by Hidalgo-Lopezosa et al (2016), who noted that stimulation with oxytocin increases the frequency of cesarean section [34].

Our study also analyzed the incidence of perineal trauma in correlation with the augmentation of labor. It was found that in the group of women giving birth whose contractions were stimulated by oxytocin, the risk of perineal incision was increased. Studies by Espada-Trespalacios et al indicate a relationship between the stimulation of oxytocin and a higher number of perineal incisions [33]. Our research shows that perineal laceration occurs less frequently in the group of patients whose birth was stimulated by oxytocin. Studies conducted by Hidalgo-Lopezosa et al (2016) show that oxytocin stimulation does not affect the frequency of the third- and the fourth-degree perineal lacerations and perineal incisions [34].

Our study shows that use of augmentation of labor was associated with longer duration of the first and the second stage of labor, as well as the entire labor. Espada-Trespalacios noted that the length of the first stage of labor was prolonged by 46 min in the presence of oxytocin, but this was not a statistically significant result. However, the duration of the second stage of labor was increased by 18 min and this result was statistically significant [33]. On the other hand, Boie et al found that oxytocin stimulation has little or no effect on duration of the second stage of labor, suggesting that oxytocin may not be necessary during the descent and the baby's head birth [13]. Aboshama et al noted that shorter time of delivery occurred in the high-dose oxytocin group compared to the low-dose oxytocin group [35]. Hidalgo-Lopezosa et al, by dividing the group into primiparous and multiparous, noticed that the first stage of labor with stimulation is significantly shorter in primiparous women, while in multiparous women there were no differences [34]. A French study by Dupont et al (2017) recommends that if delivery in the active stage is prolonged, the first-line treatment is amniotomy, and in the absence of improvement within 1 h, oxytocin should be administered, but if the second parturition stage is prolonged beyond 2 h, oxytocin is recommended to correct the absence of labor progression [8].

According to the WHO, primary postpartum hemorrhage is the loss of more than 500 ml of blood from the birth canal within 24 h after natural birth [36,37]. Belghiti et al stated that the use of oxytocin during childbirth appears to be an independent risk factor for severe PPH (postpartum hemorrhage) [12]. Nune et al indicated the risks and adverse effects associated with the use of oxytocin during childbirth; in addition to nausea and vomiting, postpartum hemorrhage is also higher, especially when a large dose is used during delivery [9]. In our study, it was noted that the average amount of blood loss is higher during labor, in which the uterine contractions were stimulated.

The present study found that the average birth weight of the newborn was higher in the group of women who underwent augmentation of labor with oxytocin. Litorp et al showed that women who had augmentation of labor with oxytocin were more likely to give birth to children weighing more than 2500 g [7]. On the other hand, Zhang et al found no differences between augmentation of labor and the newborn's body weight [30].

The most commonly used measure of a newborn's health after childbirth is the Apgar scale [38]. In our study, neonates were more likely to have the Apgar score below 7 points at the 1st and 5th minutes postpartum. Raba et al also noticed a higher percentage of newborns with Apgar scores ≤7, born by natural birth by mothers, and in whom the birth was stimulated with oxytocin, but only in the first minute of life [39]. Litorp

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et al also showed the association between augmentation of labor with oxytocin and low Apgar score, but only in the 5th minute [7]. However, Farag et al did not show a statistically significant difference between the stimulation of oxytocin and Apgar scores in the 1st and 5th minutes [40]. Hidalgo-Lopezosa et al also did not find any significant differences related to oxytocin stimulation and Apgar score at the 5th minute [34].

Our study shows there are factors that increase the frequency of pharmacological augmentation of labor, as well as factors that reduce the use of this procedure. Further identification of factors influencing the frequency and legitimacy of the use of birth stimulation is advisable, because it provides high-quality perinatal care, based on scientific evidence, in accordance with current medical knowledge. Being aware of the factors that influence the use of certain medical procedures, such as the augmentation of labor, is necessary for planning safe and effective perinatal care, to avoid unjustified interventions and unnecessary complications.

Our study included a large sample size and a long period of collected data. In addition, the data were collected in a single facility, which reduced the risk of bias caused by differences in data collection or practices. The single-center nature of our study is both an advantage and a drawback. In addition, the data for the study were collected from electronic documentation, which showed some deficiencies resulting from the applied research method. Another limitation is that, despite the large size of the study group, the single-center design does not show the diversity resulting from the different activities of health care institutions providing care to parturient women, resulting from internal standards of conduct. However, these limitations do not appear to affect the quality of the study.

Conclusions

This study from a single center in Poland showed that BMI, preinduction, epidural anesthesia, and family birth significantly increased the frequency of augmentation of labor with oxytocin. However, a history of previous pregnancies, previous cesarean sections, and pre-pregnancy hypertension significantly reduced the frequency of augmentation of labor with oxytocin. There is a need for further research in this area and to create clear guidelines concerning the legitimacy and manner of performing the augmentation of labor procedure and to personalize indications depending on the course of childbirth.

Department and Institution Where Work Was Done

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