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## SAFE REDUCTION OF CESAREAN SECTION RATE IN THE SECOND STAGE OF LABOR – POSSIBLE SOLUTIONS

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**Abstract:** Cesarean section is the most commonly performed operation in the world with an ever-increasing frequency. Among the most common indications for cesarean section are abnormalities of pelvis leading to fetopelvic disproportion during labor, placenta previa, placental abruption, preeclampsia, concomitant diseases of the mother, as well as fetal conditions leading to distress, malpresentation of the fetus, etc. Despite the definite benefits it brings to the mother and fetus, there are a number of early and late complications that worsen obstetric results in women who have given birth by cesarean section. There is evidence that the incidence of cesarean sections is higher than optimal and continues to increase. Often a cesarean section is performed due to relative indications and in a large number of cases a safe vaginal birth is possible. The proportion of emergency cesarean sections performed in the second period of labor is not small. This necessitates a review of obstetric behavior, in particular the usage of operative vaginal delivery (OVD) and cardiotocographic (CTG) monitoring of the fetus in the second period of labor. In contrast to the ever-increasing incidence of cesarean section, the incidence of operative vaginal delivery with both vacuum extractor and forceps has decreased significantly in recent years. This trend is to the detriment of obstetric practice as OVD in the hands of an experienced obstetrician is a safe alternative to cesarean section during vaginal birth. Abnormalities in the fetal heart rate (FHR) is the second most common indication for all cesarean sections. It is estimated that between 65% and 85% of all births at some point have a category II FHR that include bradycardia with variability, tachycardia, minimal variability, no variability with no recurrent decelerations, marked variability, absence of induced accelerations even after fetal stimulation, recurrent variable decelerations with minimal or moderate baseline variability, prolonged decelerations lasting more than two minutes, but less than ten minutes, recurrent late decelerations with moderate variability, variable decelerations with other characteristics such as slow return to baseline, overshooting the baseline, or 'shoulders'. A clear approach in these cases is paramount to the outcome of the labor. Knowledge and proper management of operative vaginal birth by vacuum extractor or forceps, as well as the correct interpretation of CTG patterns can significantly reduce the frequency of cesarean sections during labor without adversely affecting the condition of the mother or newborn. These methods should be mastered as much as possible during the specializations in obstetrics and gynecology in order to improve the outcome of a normal labor and reduce the frequency of cesarean section in the future.

**Keywords:** CTG, Operative vaginal delivery, Cesarean section

### 1. INTRODUCTION

In recent years, there has been a sharp increase in the number of cesarean sections worldwide. One in three women in the United States gave birth by caesarean section by 2011.<sup>10</sup> Despite the benefits of this operation for the mother and fetus associated with a reduction in perinatal morbidity and mortality, it is likely to be excessively overused.<sup>9</sup> Increasingly, women are giving birth at advanced age and after assisted reproduction. In these cases, the chance of getting pregnant is reduced due to the reduced number and quality of eggs and embryos that are achieved. Pregnancies that occur in these cases are perceived by patients and doctors as more special and are often delivered by cesarean section.<sup>11-17</sup> Cesarean section is associated with a number of short-term and long-term complications, which requires careful determination of the correct method of delivery for each pregnant woman. In low-risk pregnancies, cesarean delivery remains the riskier method of delivery compared to vaginal birth in terms of maternal morbidity and mortality. The postoperative period after cesarean section in some cases is associated with specific complications that increases hospital stay and the need for additional treatment.<sup>22-24</sup> Measures to reduce unnecessary cesarean sections can be taken both in relation to planned births and during vaginal birth, especially in the second period of labor. More than 20% of cesarean deliveries for dystocia are performed during the second stage of labor.<sup>8</sup> The purpose of this review is to analyze possible solutions in the second period of birth to reduce the frequency of cesarean section.

### 2. EXPOSITION

The second period of labor begins with the full dilatation of the cervix and ends with the birth of the fetus. Duration of this period of birth depends on many factors such as parity, delayed pushing, use of epidural analgesia, maternal

body mass index, birth weight, occiput posterior position, and fetal station at complete dilation.<sup>26, 36</sup> The diagnosis of arrest of labor in the second period of birth is usually made after at least 2 hours of pushing in multiparous and at least 3 hours in primiparous women.<sup>4</sup> This period before the diagnosis of arrest of labor can significantly reduce the frequency of cesarean section during a normal labor. An alternative and addition to this behavior may be operative vaginal delivery.

In contrast to the ever-increasing incidence of cesarean section, the incidence of operative vaginal delivery (OVD) with both vacuum extractor and forceps has decreased significantly in recent years.<sup>33</sup> This trend is to the detriment of obstetric practice as OVD in the hands of an experienced obstetrician is a safe alternative to cesarean section during vaginal birth. The potential risks to the mother in OVD are associated primarily with soft tissue damage. Risk of third or fourth degree perineal laceration is increased with operative vaginal delivery.<sup>18</sup> Some authors believe that the risk of urinary and fecal incontinence is increased in OVD, but it is not clear whether the increased risk persists for a lifetime.<sup>30</sup> All these risks must be weighed against the known risks of cesarean. Regarding the risk to the newborn in the various methods of delivery, the results are interesting. Some authors did not find a difference in the frequency of intracranial hemorrhage in deliveries with vacuum, forceps or cesarean section.<sup>34</sup> Some authors suggest that a forceps-assisted vaginal delivery is associated with a reduced risk of adverse neonatal neurologic outcomes compared with either vacuum-assisted vaginal delivery or cesarean delivery. Forceps-assisted vaginal delivery is associated with fewer composite neurologic complications (intraventricular hemorrhage, subdural hemorrhage, and seizure) than either vacuum-assisted vaginal delivery or cesarean delivery.<sup>21, 35</sup> Some studies proved, that vacuum-assisted delivery is at least as safe, as delivery by forceps, with similar rates of neonatal complications like neonatal death and intracranial haemorrhage. The risk for seizures is lower for vacuum deliveries. The higher risk of adverse neonatal outcome is where vacuum and forceps was used sequentially.<sup>6</sup> With regard to the risk of OVD failure, it was found that less than 3% of births ended in cesarean section after an attempt for OVD.<sup>25</sup> Performing low or outlet procedures on fetuses that are not expected to be macrosomic is considered a safe way to reduce cesarean sections in the second period of labor.<sup>1</sup> Unfortunately, the number of experienced obstetricians who are trained in the proper use of a vacuum extractor or forceps is constantly declining. It is estimated that more than half of residents in obstetrics and gynecology do not feel sufficiently prepared to perform forceps birth during their specialization and would primarily use a vacuum extractor, although there are experienced physicians who are willing to teach them. The use of a vacuum extractor is a method that almost every resident in obstetrics and gynecology at the end of his specialization considers to be proficient.<sup>27</sup> Therefore, proper training of residents in operative vaginal delivery is an important step in reducing cesarean sections during labor. The first step in this training is choosing the right instrument, which depends mainly on factors such as possible damage to the mother and fetus, probability of success / failure and the operator's experience with different types of instruments.<sup>31</sup> It has been proven, that the chance of a failed operative delivery using vacuum is almost two times greater than with forceps.<sup>18</sup>

Another possibility for a significant reduction in the number of cesarean sections is the correct interpretation and management of fetal heart rate (FHR) patterns during labor. Abnormalities in the fetal heart rate is the second most common indication for all cesarean sections. The introduction of standards in the reading and interpretation of cardiotocographic recording during labor is a good opportunity to reduce cesarean section rate in the second period of delivery. Category III fetal heart rate tracings are abnormal and require intervention. They include absent fetal heart rate variability with recurrent late decelerations, recurrent variable decelerations, bradycardia or a sinusoidal rhythm. They are associated with abnormal neonatal arterial umbilical cord pH, encephalopathy and cerebral palsy.<sup>3,19,20,28,29</sup> Category I fetal heart rate tracings are normal and do not require any intervention. In these cases, only ongoing monitoring is required due to the possibility of changes during labor. Most characteristics of the CTG at birth fall into category II. They are the most controversial and difficult to interpret, but their good knowledge is the key to effectively reducing the frequency of cesarean sections in both the first and second periods of labor. It is estimated that between 65% and 85% of all births at some point have a category II FHR and a clear approach in these cases is paramount to the outcome of the labor.<sup>7</sup> The classification of Category II tracings includes the following: bradycardia with variability, tachycardia, minimal variability, no variability with no recurrent decelerations, marked variability, absence of induced accelerations even after fetal stimulation, recurrent variable decelerations with minimal or moderate baseline variability, prolonged decelerations lasting more than two minutes, but less than ten minutes, recurrent late decelerations with moderate variability, variable decelerations with other characteristics such as slow return to baseline, overshooting the baseline, or 'shoulders'. Category II FHR tracings are indeterminate and contain many possibilities and management is typically determined by which of the possibilities exist. These tracings typically require closer supervision, more frequent evaluation, documentation and correction of abnormalities by conservative management and intrauterine resuscitation. Accelerations and moderate variability suggest normal acid-base balance.<sup>1</sup> When assessing fetal status with category II FHR tracing it is important to consider the likelihood of birth occurring within a reasonable time frame to avoid progressive

deterioration of fetal status. Management of category II FHR usually requires intrauterine interventions like lateral maternal position, intravenous fluids bolus, reduction of uterine activity, correction of maternal hypotension, administration of oxygen.<sup>5</sup> The goal is to attempt to resolve any clinical situations that are impeding adequate fetal oxygenation, allow labor to continue and support the birth of a vigorous baby.<sup>32</sup>

### 3. CONCLUSION

At a time of ever-increasing frequency of cesarean sections, it is of paramount importance to invest time and effort in mastering the methods of operative vaginal birth and electronic monitoring of the fetus during vaginal labor. This will reduce the frequency of cesarean sections without further negative impact on the health of mother or fetus.

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