

The mounting rate of cesarean sections

Is it accompanied by a drop in instrumental births?

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ABSTRACT

الهدف: إيجاد العلاقة بين الزيادة في معدل الولادات القيصرية والهبوط في معدل الولادات بواسطة الشفط والملقط.

الطريقة: لقد تم مراجعة جميع ملفات الولادات القيصرية التي أجريت في مستشفى الملكة علياء العسكري، عمان، من تاريخ ١٩٩٢/٠١/٠١ ولغاية ٢٠٠٦/١٢/٣١ م. تم التركيز على طرق الولادات، سبب العمليات القيصرية والمضاعفات إن وجدت.

النتائج: خلال فترة الدراسة كان عدد الولادات الإجمالي ٥٣١٩٤ ولادة وعدد العمليات القيصرية تقريباً ٥٦٠٠ عملية، أي بمعدل ١٠,٥. أما عدد الولادات بواسطة الشفط فكانت ١٥٠٠ ولادة أي بمعدل ٢,٨٪ وبواسطة الملقط ٣٧٠ ولادة أي بمعدل ٧,٠٪. النتائج الكلية للدراسة تشير إلى هبوط في معدل الولادات بواسطة الشفط والملقط خلال الفترة الثانية من الدراسة.

خاتمة: إن الزيادة في معدل الولادات القيصرية في مستشفى الملكة علياء العسكري كان مصاحباً بهبوط في معدل الولادات بواسطة الشفط والملقط.

Objective: To determine whether the overall increase in rate of cesarean sections is accompanied by a parallel decrease in instrumental births.

Methods: A retrospective study carried out at the Queen Alia Military Hospital, Amman, Jordan. The records of all deliveries from January 1992 to December 2006 were reviewed, and analyzed. Points considered were the mode of delivery, indication, and any complication that might have ensued.

Results: During the 15-year period, there were 53194 deliveries. There were 5599 cesarean sections with an overall incidence of 10.5%, 1506 (2.8%) had a successful vacuum delivery, while only 370 (0.7%) had a forceps delivery. There was a statistically significant decrease in the use of both the vacuum extractor and the forceps after the new millennium, as compared to the last 7 years of the 20th century.

Conclusion: The rising rate of cesarean sections at our hospital was accompanied by a drop in the rate of both the forceps and the ventous extractor.

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The modern predicament in obstetrics involves cesarean sections, the most frequently performed surgical procedure in the United States.¹ Regardless of the geographical location, the rate is increasing.¹ In the late 80's, there was a rise followed by a plateau.² However, with the birth of the new millennium, the trend of increasing incidence has become more apparent.¹ The main explanation is the fear of litigation. Other reasons include decreasing average parity, reluctance to perform vaginal operative deliveries, increased mean neonatal birth weight, concerns over aggressive oxytocin use, increased use of continuous electronic fetal monitoring, and more women with previous abdominal deliveries.^{1,3} While abdominal deliveries can save lives of patients and their newborns, and prevent the possible problems of a delayed vaginal birth, there are many complications associated with this procedure.⁴⁻⁶ These include wound infection, urinary tract infection, postoperative phlebitis, and endometritis.⁶ Babies delivered with elective cesarean surgery, and before the onset of labor seem to have a greater risk of respiratory distress syndrome, hypoglycemia, hypocalcemia, pneumonia or sepsis, transient tachypnea of the newborn, and meconium aspiration syndrome.^{4,7,8} On the other hand, findings in the term breech trial suggest strongly that planned cesarean sections, compared with planned vaginal

birth, lowers the risk of adverse perinatal outcome.⁹ Most junior obstetricians all over the world are now reluctant to perform an instrumental delivery.^{4,9} Their fear is a result of their observation that many medically oriented legal complaints worldwide are secondary to the improper use of the vacuum extractor or forceps.¹⁰ This study was undertaken to determine whether the increase in the incidence of cesarean sections at our hospital was associated with a concomitant decrease in the rate of instrumental deliveries.

Methods. Queen Alia Military Hospital is a referral hospital located in Amman, Jordan. It has a capacity of around 200 beds. Since its inauguration in 1988, it has increasingly become the preferred hospital to military personnel and their families. The records of all deliveries in this hospital between January 1992 and December 2006 were reviewed. Approval for the study was obtained the Institutes ethical committee. The files of the women who underwent a cesarean section were analyzed for age, parity, indication, and any complication that might have ensued. An account of all other women, and the mode of their deliveries were made. This review included all cesarean sections, normal, breech, twins, and all instrumental deliveries.

Statistical analysis was carried out using GraphPad® Instat software. The data was analyzed using a contingency table, which determined the Chi-square and the *p* value, where *p*<0.05 was considered statistically significant.

Results. During the period of the study, there were 53194 deliveries. Cesarean sections were performed on 5599, with an overall incidence of 10.5%. Successful vacuum delivery was performed on 1506 women (2.8%), while only 370 (0.7%) had a forceps delivery (Table

1). In order to determine whether there was a decrease in the rate of instrumental deliveries during the study period, Table 1 also gives detailed account of each year. As can be seen in Table 2, we note that by comparing the 2 groups (92-99 and 00-06) there was a statistically significant decrease in the use of both the vacuum extractor (*p*=0.0013) and the forceps (*p*<0.0003). Similarly, it also illustrates a statistically significant drop in breech (*p*=0.0001) and twin deliveries after the new millennium (*p*=0.0289). The indications of all cesarean sections can be seen in Table 3. It is interesting to note that the rate of failed instrumental deliveries is somewhat constant throughout the 15-year period of the study (*p*>0.05). Table 4 demonstrates all the adverse effects of the abdominal births. As shown, blood transfusion and atelectasis were the dominant complications over the 15-year period. No statistically significant differences were noted in any of the complications throughout the entire period of the study.

Among the serious complications, 2 maternal deaths occurred after the year 2000 compared to none, in the 90's. Although not statistically significant (*p*>0.05), they are worth mentioning. The first was secondary to massive pulmonary embolism, while the second was due to placenta percreta. This was followed by disseminated intravascular coagulopathy, secondary to massive blood loss. Vascular surgeons were involved in the management.

Discussion. It is alarming that the incidence of cesarean sections worldwide is increasing. Obstetrics is a specialty that is widely perceived to be associated with a high risk of litigation. In the United Kingdom, it accounts for approximately 60-70% of the total sum (malpractice) paid by the National Health Service Litigation Authority, each year.¹⁰ Professionals involved

Table 1 - Overall deliveries at Queen Alia Military Hospital.

Case	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
Normal	1761 (83.6)	2287 (87.0)	2633 (84.4)	2882 (86.1)	3079 (86.1)	3077 (85.4)	3103 (84.2)	3076 (83.8)	3157 (83.4)	2837 (82.1)	3069 (81.4)	3333 (82.6)	3090 (79.7)	3669 (82.7)	3266 (79.8)	44319 (83.3)
Cesarean	149 (7.1)	172 (6.5)	260 (8.3)	264 (7.9)	296 (8.3)	302 (8.4)	336 (9.1)	363 (9.9)	400 (10.6)	410 (11.9)	467 (12.4)	461 (11.4)	523 (13.5)	537 (12.1)	659 (16.1)	5599 (10.5)
Vacuum	101 (4.8)	66 (2.5)	120 (3.8)	95 (2.8)	78 (2.2)	104 (2.9)	121 (3.3)	106 (2.9)	86 (2.3)	84 (2.4)	120 (3.2)	125 (3.1)	146 (3.8)	96 (2.2)	58 (1.4)	1506 (2.8)
Forceps	22 (1.0)	36 (1.4)	29 (0.9)	21 (0.6)	29 (0.8)	21 (0.6)	29 (0.8)	27 (0.7)	28 (0.7)	35 (1.0)	11 (0.3)	10 (0.2)	21 (0.5)	27 (0.6)	24 (0.6)	370 (0.7)
Breech	46 (2.2)	36 (1.4)	49 (1.6)	48 (1.4)	45 (1.3)	52 (1.4)	57 (1.7)	49 (1.3)	50 (1.3)	48 (1.4)	55 (1.5)	41 (1.0)	35 (0.9)	42 (0.9)	31 (0.8)	684 (1.3)
Twins	28 (1.3)	34 (1.3)	29 (0.9)	39 (1.2)	50 (1.4)	47 (1.3)	41 (1.1)	49 (1.3)	65 (1.7)	40 (1.2)	49 (1.3)	63 (1.6)	61 (1.6)	68 (1.5)	53 (1.3)	716 (1.3)
Total	2107	2631	3120	3349	3577	3603	3687	3670	3786	3454	3771	4033	3876	4439	4091	53194

Data presented in numbers and percentages.

Table 2 - Comparison of modes of delivery of the study population ($p<0.05$).

Cases	1992-1999	2000-2006
Normal	21898	22421
Cesarean	2142	3457
Vacuum	791	715
Forceps	214	156
Breech	382	302
Twins	317	399

Table 3 - Indications of cesarean sections

Indication	1992-1999	2000-2006	Total
	n (%)		
Failure to progress	408 (19.0)	624 (18.0)	1032 (18.4)*
Previous 2 or more sections	339 (15.8)	622 (18.0)	961 (17.2)†
Fetal distress	340 (15.9)	551 (16.0)	891 (15.9)*
Cephalopelvic disproportion	236 (11.0)	364 (10.5)	600 (10.7)†
Antepartum hemorrhage	183 (8.5)	279 (8.1)	462 (8.2)*
Failed induction of labor	141 (6.6)	210 (6.1)	351 (6.3)*
Failed instrumental delivery	102 (4.8)	136 (3.9)	238 (4.3)*
Pre-eclampsia	104 (4.9)	153 (4.4)	257 (4.6)*
Breech	85 (4.0)	228 (6.6)	313 (5.6)†
Abnormal lie	54 (2.5)	58 (1.7)	112 (2.0)†
Multiple pregnancy	113 (5.3)	169 (4.9)	282 (5.0)*
Cord prolapse	34 (1.6)	60 (1.7)	94 (1.7)*
Eclampsia	3 (0.1)	3 (0.1)	6 (0.1)*

* $p>0.05$; † $p<0.05$

Table 4 - Maternal complications of cesarean sections ($p>0.05$).

Maternal complication	1992-1999	2000-2006	Total
	n (%)		
Blood transfusion	152 (7.1)	281 (8.1)	433 (7.7)
Atelectasis	148 (6.9)	257 (7.4)	405 (7.2)
Wound infection	86 (4.0)	131 (3.8)	217 (3.9)
Fever	65 (3.0)	75 (2.2)	140 (2.5)
Deep vein thrombosis	11 (0.5)	11 (0.3)	22 (0.4)
Cesarean hysterectomy	4 (0.2)	9 (0.3)	13 (0.2)
Ruptured uterus	4 (0.2)	3 (0.1)	7 (0.1)
Headache (spinal anesthesia)	0	6 (0.2)	6 (0.1)
Maternal death	0	2 (<0.1)	2 (<0.1)
Pulmonary embolism	2 (0.1)	1 (<0.1)	3 (<0.1)

in malpractice claims can become demoralized, and the fear of litigation might be deterring young medical graduates from entering the specialty, leading to a recruitment crisis.¹⁰ Intrapartum fetal distress, shoulder dystocia, and complications of vaginal birth after cesarean section account for the majority of obstetric litigation.¹⁰ In order to determine whether this phenomenal increase is really beneficial, we need to determine whether the rate of cerebral palsy (CP) is declining. We depend on CP, as many other factors play a role in maternal or perinatal mortalities, such as the use of regional anesthesia, recent and more effective antibiotics, and lung surfactant, as well as major advances in fetal medicine, ultrasound scanners, and cardiotocography are some of the factors that helped dramatically in reducing the maternal and perinatal mortalities.

A Canadian study published in 2000 determined that although the incidence of cesarean sections has gone up by a factor of 3, the rate of CP remained constant, which in reality means that many abdominal births are performed unnecessarily.¹¹ The aim of our study was to identify whether there was a parallel decrease in the use of instrumental deliveries with the increase in the incidence of cesarean sections. Not surprisingly, there was a statistically significant drop in the use of both the forceps and the ventouse extractor, as well as in the incidence of breech and twin deliveries. This agrees with Akasheh and Amarin,¹² and DiMarco et al,¹³ which concluded by stating that the temporal trend of increased cesarean delivery rate appears to be secondary to reduced rate of forceps and vacuum assisted deliveries.

Is there an end to this trend? Apparently not. We believe that in the near future, there will be further reduction in vaginal deliveries, and this tendency will migrate from the developed countries to include the developing, and the third world countries.

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