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CESAREAN SECTION IN FOUR RIO DE JANEIRO HOSPITALS

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Abstract

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Data collected on maternity patients at four hospitals in Rio de Janeiro, Brazil, show that their rates of cesarean section vary considerably, ranging from less than 15% of all deliveries at the hospital serving women from the lowest socioeconomic group to over 80% at the one restricted to private patients. Virtually none of the conditions usually considered as indication for cesarean delivery were universally managed in this manner. On the other hand, in many instances, there was no recorded indication for abdominal delivery. While mortality and morbidity rates were low, exposure of mothers and infants to the additional risks associated with surgery for no apparently valid reason is unwarranted.

Introduction

During 1977 and 1978, an international collaborative maternity care monitoring project was carried out at four hospitals in Rio de Janeiro, Brazil, in cooperation with the International Fertility Research Program (IFRP). These studies were part of a series of more than 100 conducted in over 30 countries to establish the routine measurement of maternity care that affords health planners a means of identifying and analyzing the problems confronting them.

The heart of the project is a two-ply, single-sheet Maternity Record designed by the IFRP in cooperation with the International Federation of Gynaecology and Obstetrics (FIGO). The IFRP has also developed computer programs to routinely process the records and to check for errors. When recording is complete, the services of IFRP's standard computer analysis programs are offered to the collaborating hospital.

The standard analysis tables provide information on the mortality and morbidity for both mother and infant, the social and demographic characteristics and obstetric history of the mother, the distinctive course, complications and management of her delivery, the outcome of the pregnancy and the condition of the infant, the mother's desire for additional children and her contraceptive intentions. The analysis presented here is mainly from these tables, but some specialized computer runs were made.

Although the Maternity Record covers many aspects of delivery and obstetric care, the focus of this paper is cesarean section.

The rates in the four hospitals and the reasons for the intervention will be examined and attempts made to explain the differences.

Materials and methods

This analysis covers 1819 deliveries occurring during 1977 and 1978, 447 at the Alexander Fleming Hospital (May 1 to October 31, 1977), 210 at the Casa de Portugal Hospital (February 24, 1977 to June 12, 1978), 428 at the Enfermaria 33 (January 9, 1977 to April 28, 1978) and 734 at the Faculdade de Medicina de Campos (July 1, 1977 to June 30, 1978). The number of deliveries refers to the number of mothers; the numbers of babies were 452, 211, 432 and 745, respectively. All multiple births were twins; there were no triplets or higher order multiple births.

Data on each patient admitted for obstetric delivery were entered on the Maternity Record and these forms were then shipped to the IFRP for processing and analysis.

Results

There is considerable variation among the four hospitals with respect to the type of population they serve, their management of complications and the outcome of pregnancy. Table I shows selected characteristics of patients at the four hospitals. Patients at the Casa de Portugal (all private beds) are well-educated women who have received excellent antenatal care; they are relatively old, almost half of them nulliparous. At the other end of the continuum is the Faculdade de Medicina de Campos, where the vast majority of patients have 6 years of education or less and do not seek antenatal care until relatively late in the pregnancy; one fifth are high parity (five or more previous live births). The patients at the Alexander Fleming and the Enfermaria 33 fall between these two extremes; at the Alexander Fleming women are more likely to be in high-risk groups as a consequence of their age and parity, but at the Enfermaria 33 because of low education and failure to seek antenatal care. However, these differences are not great.

Cesarean sections

In the four hospitals, 499 cesarean sections were performed, or 27.5% of all deliveries. Of these, 161 (32.3%) were repeat sections; the most common reason for the remaining 338 primary sections was prolonged or obstructed labor (140 cases). Fully 12% of abdominal deliveries at the four hospitals were done for no apparent medical indication or for an indication that some physicians might not consider pressing. Only one of these resulted in a low birth weight infant, suggesting that elective sections were done appropriately.

Table II summarizes the broad differences among the hospitals; each will now be examined separately.

(1) Alexander Fleming. This hospital had a cesarean section rate of 28.8%; about one third of these women had previously been delivered surgically. There was no apparent medical indication for 11 (13.3%) of the primary sections. The most common justification for abdominal delivery was prolonged or obstructed labor (48.2% of primary sections), and the rest were about equally divided between maternal and fetal concerns.

There were seven low birth weight infants delivered by primary cesarean section. Four of these mothers were elderly primiparae (36, 37, 38 and 41 years old, respectively), three of them with additional indications (placenta previa, placenta abruptio and prolonged labor); onset of labor was spontaneous for all four. The other three cases were indicated by diabetes, placenta previa and placenta abruptio.

Of the three repeat abdominal deliveries that resulted in a low birth weight infant, one, a 21-year-old woman with a history of stillbirth, was sectioned before onset of labor; one 19-year-old patient with a

Table I. Percentage of patients with selected characteristics at the four hospitals.

Patients	Alexander Fleming (N = 447) (%)	Casa de Portugal (N = 210) (%)	Enfermaria 33 (N = 428) (%)	de Campos (N = 734) (%)
Age (years completed)				
<20	15.7	1.5	18.8	20.0
20–24	24.4	22.4	34.4	29.8
25–29	18.6	42.4	22.5	22.1
30–34	16.6	25.7	15.7	14.2
35–39	16.1	7.6	5.4	9.8
40+	8.7	0.5	3.3	4.1
Mean	28.4	28.4	25.7	26.3
Parity				
0	40.1	44.7	54.2	31.1
1	24.1	34.1	23.0	21.0
2	12.4	19.7	10.1	11.7
3–4	10.2	1.5	5.4	14.4
5+	13.3	0.0	7.3	21.8
Mean number of live births	1.8	0.8	1.2	2.6
Education (years completed)				
None	5.0	0.0	6.6	27.1
1–6	58.5	12.0	70.2	69.5
7–12	32.3	42.1	20.0	3.2
≥12	4.1	45.9	3.2	0.1
Mean	5.9	12.6	6.3	2.3
Antenatal visits				
None	8.0	1.0	12.8	14.7
1–3	19.6	1.0	13.8	21.8
4–7	54.9	2.9	45.4	52.7
8 or more	17.5	95.2	28.0	10.8
Mean	4.9	7.8	5.0	4.2
Patients with any antenatal condition	40.1	37.5	28.0	44.0

fistula and another aged 34, parity 3, were in labor when sectioned. All of these 10 low birth weight infants survived at least until the mother was discharged from the hospital.

(2) Casa de Portugal. The cesarean section rate at this hospital was 80.2%, 40.4% of them repeat sections. No medical indication was apparent for 44 (44.4%) of the primary sections; most of these were elective procedures requested by the patients; a practice that is acceptable to many Brazilian obstetricians. The most common indication for abdominal delivery was prolonged or obstructed labor (about 15% of primary sections); for the rest, complications of labor and maternal conditions were of equal importance; fetal reasons were less frequent.

There were three low birth weight infants delivered by cesarean section, two of them clearly justifiable. The third was delivered abdominally because labor did not progress

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Table II. Cesarean sections.

	Alexander Fleming (*N* = 447)	Casa de Portugal (*N* = 210)	Enfermaria 33 (*N* = 428)	de Campos (*N* = 734)
Cesarean sections				
Number	128	166	95	109
Rate	28.8%	80.2%	22.2%	14.9%
Repeat cesarean sections				
Number	45	67	28	21
Rate	35.2%	40.4%	29.5%	19.3%
Primary cesarean sections				
Number	83	99	67	88
Rate	64.8%	59.6%	70.5%	80.7%
With apparent indication				
Number	72	55	62	88
Rate	86.7%	55.5%	92.5%	100.0%
With no apparent indication				
Number	11	44	5	0
Rate	13.3%	44.4%	7.5%	0.0%

well after a spontaneous rupture of the membranes. This baby was classified as "small-for-dates," being 2380 g at 38 weeks' gestation. All three of these infants were alive when the mothers were discharged from the hospital.

(3) Enfermaria 33. The cesarean section rate at this hospital was 22.2% of all deliveries; between one third and one fourth were repeat sections. Five (7.5%) of the primary cesarean sections had no apparent medical indication. The most common reason for primary cesarean section was again prolonged or obstructed labor (47.8%). Other complications of labor, fetal and then maternal reasons (in descending order of importance), were given for the rest of the primary cesarean sections.

Six low birth weight infants were delivered by cesarean section. One of these was for fetal distress and two for complications of labor. Another case concerned a 37-year-old primipara with severe sickle cell anemia, who was not in labor when sectioned; two others were repeat sections, one during labor. Despite efforts to delay labor, this last woman was delivered of a 1650 g infant who died shortly after birth.

(4) Faculdade de Medicina de Campos. Of the four hospitals, this had the lowest rate of cesarean section (14.9% of deliveries) and of repeat sections (19.3%). There was a medical indication for every abdominal delivery in this hospital during the study period. Prolonged or obstructed labor was the most common reason given (59.1% of primary sections), followed by malpresentation or fetal distress (19.3% taken together).

There were 13 low birth weight infants delivered abdominally, twelve of them because of complications of labor. The timing was justifiable for the remaining one, a repeat section, since the patient was in labor. Two of these infants died after delivery; both are recorded as 39 weeks of gestation, but birth weights are inconsistent with this – 1690 g and 900 g; the larger of these two infants was a twin.

The one death in the series occurred at this hospital. The 32-year-old, parity 5 patient was admitted with high blood pressure (220/140). The membranes were intact and the fetal heart rate was 140 beats/min. A cesarean section was performed because of uterine hypertonia. Cardiac arrest occurred on the operating table, but the patient recovered after 20 min of treatment. However, she died 2 weeks later of a cerebrovascular accident complicated by a respiratory infection. The 3200 g baby girl died of respiratory distress syndrome during the neonatal period.

Table III shows the number of women who experienced a particular complication (maternal, fetal or of the labor or delivery) and the proportion of those women who were delivered by cesarean section. The table is constructed so that all indications for abdominal delivery were listed and then ranked in the order of imperativeness of abdominal delivery. Thus, because the authors and IFRP obstetricians believe that cesarean section is almost always mandatory after a

Table III. Incidence of complications[a] and the proportion of women with those complications who were delivered abdominally.

Complication	Alexander Fleming		Casa de Portugal		Enfermaria 33		de Campos	
	With comp. No.	Abdominal delivery (%)	With comp. No.	Abdominal delivery (%)	With comp. No.	Abdominal delivery (%)	With comp. No.	Abdominal delivery (%)
Previous cesarean section	58	77.6	71	94.4	36	77.8	38	55.3
Cephalopelvic disproportion	1	100.0	0	–	0	–	1	100.0
Placenta previa	1	100.0	1	0.0	3	33.3	2	100.0
Placenta abruptio	5	60.0	0	–	2	0.0	8	62.5
Prolonged/obstructed labor	51	84.3	15	100.0	37	86.5	71	77.5
Breech presentation	10	30.0	5	100.0	7	57.1	22	22.7
Fetal distress	25	20.0	8	87.5	32	25.0	20	27.0
Malpresentation[b]	5	20.0	2	50.0	2	50.0	128	9.4
Toxemia	5	40.0	3	100.0	2	50.0	11	9.1
Cord prolapse	1	100.0	0	–	0	–	0	–
Diabetes	8	62.5	4	100.0	5	20.0	0	–
Hypertensive disorders	15	26.7	5	80.0	2	0.0	8	0.0
Renal disorders	0	–	1	100.0	0	–	0	–
Elderly primipara	3	33.3	1	100.0	2	100.0	2	50.0
Failed induction	0	–	3	100.0	2	100.0	0	–
Dysfunctional contractions	16	6.3	6	100.0	7	14.3	4	25.0
Premature rupture	16	0.0	1	100.0	25	20.0	15	0.0
Other	11	9.1	7	57.1	14	28.6	5	0.0
No recorded condition	214	5.1	74	59.5	249	2.0	397	0.0
TOTAL	445	100.0	207	100.0	427	100.0	732	100.0

[a]See text for explanation.
[b]Other than breech.

previous cesarean section, this reason would take precedence over any other indication. Once such an indication has been ascribed to a patient, she is no longer a candidate for those listed lower in the table. Consequently, although 12 patients with a breech presentation were delivered abdominally at the Alexander Fleming Hospital, only three of them show up in Table III; the remaining nine had an indication that took precedence over breech presentation.

The most interesting fact emerging from Table III is that, except for two rare complications (involving only three patients), there is no complication that is universally managed with cesarean section. Even though most obstetricians consider previous cesarean sections as indications for subsequent abdominal deliveries [6], at all four hospitals there were some patients with such a history who were allowed to deliver vaginally. About one in five was in this category in the four hospitals taken together and they ranged from almost half the number with previous cesarean sections at the Faculdade de Medicina to 5.6% (four women) at the Casa de Portugal.

Discussion

According to present-day concepts of perinatology, the psychologic aspects of labor and delivery have important implications for the parents and the child. The birth process should be an event characterized by tenderness, calm and dignity. It ought to be timely at all its physiologic stages, as rapid and painless as possible and never injurious to the life and future health of both mother and child. Technically, this

should be easy to accomplish if careful preparations have been carried out under experienced professional control and if resources and facilities are adequate. The judicious use of medication, reducing this to a minimum to avert or minimize undesirable effects on the fetus, is essential to correct any deviation from the normal course [2,9,11]. So, too, is surgical intervention. Although the natural vaginal delivery is preferred, if successful vaginal delivery does not occur within a reasonable length of time, the physician must resort to other interventions, including cesarean section, before there is evidence of fetal distress. Under proper conditions, cesarean delivery is a simple, rapid and safe procedure.

The rationale for deciding to perform a cesarean section is often quite clear. It can be to save the life of the mother and/or the infant or to reduce morbidity in both. But sometimes the reasons are more obscure, requiring that various factors be weighed and the competing risks and benefits evaluated. Although arriving at a decision may be difficult, it should always be made in light of the patient's particular circumstances rather than dictated by dogmatic hospital policy.

Certain issues to be considered may be unrelated to the present delivery and others apply to some patients but not to others. In addition to clear medical indications, the obstetrician addressing the problem of management must keep the following factors in mind:

(1) Maternal mortality and morbidity. Because of increased use of anesthesia as well as the surgical intervention itself, abdominal delivery is riskier to the mother than vaginal delivery [3,4,6]. In the case of a mother with several living children, the value of an additional child may not outweigh the increased risk.

The physician must maintain concern for the gynecologic future of the patient, including the possibility of lesions to the cervix, vagina, bladder and perineum which may affect the physiology of the pelvic organs or sexual activity. Nowadays, the woman's position at delivery is considered of great importance in preventing obstetric lesions to soft tissues. The obstetric future of the patient, the number of additional children she is likely to have, must be taken into account, since abdominal delivery cannot be repeated too often. Is the patient likely to have her next baby in the hospital? With a patient who sought no medical care until she was in labor, or resides in a distant rural area, there is the possibility that her next delivery will be at home, incurring the increased risk of a ruptured uterus.

(2) Neonatal mortality and morbidity. Rising cesarean rates in many hospitals in the United States during the past decade are attributed to fetal indications. Abdominal delivery is now recommended in most cases of cephalopelvic disproportion, fetal distress and breech presentation [5–8]. The use of fetal monitoring is a contributing factor leading, in many instances, to surgical intervention [1,10].

If the mother is not in labor, the probable maturity of the infant is critical. Even with the sophisticated resources available in some hospitals, errors in estimated gestation are made. If any doubt about gestation exists and the fetus is not at risk, it is wiser to let the pregnancy continue and wait until labor starts spontaneously. A physician's error is suggested whenever an elective cesarean section results in a low birth weight infant. Although in this series there were only three deaths among the low birth weight, abdominally delivered infants, it is not possible with these data to assess the long-term effects on those infants who survived. The process of labor itself is adaptive; the passage through the constricted space of the birth canal and the rhythmic contractions squeeze the infant's chest, clearing and maturing the lungs. Thus, unless the advantages of abdominal delivery are clear, the advantages of vaginal delivery should not be overlooked.

Then there is the question of what is sometimes called a "priority baby." Examples of this include the primipara who is over age 30, the patient who has had one or more stillbirths and the successfully counseled infertility patient. What these patients have in common is the probably greater importance of their baby's survival to them than to a woman who already has two or more living children. In this situation, if abdominal delivery would be advantageous to the baby, then perhaps the additional risk to the mother should be discounted. It may be somewhat of a paradox that many obstetricians elect cesarean section for "priority babies."

If it is clear that a patient will probably require a cesarean section, when should the pregnancy be terminated? Should this woman be permitted a trial of labor? If so, what resources will be available in the hospital should she need the cesarean section during the night or weekend? Can gestational age be estimated with reasonable accuracy? Only the attending physician can answer these questions, since only he knows both the patient's situation and the hospital's facilities. But they require the most serious consideration. The decision to deliver abdominally should never be taken lightly, nor made for frivolous reasons [3,7].

It is not possible to evaluate each of the 499 abdominal deliveries with Maternity Record data. Mortality and morbidity were low in these hospitals; the hospitals clearly have the resources to provide satisfactory care for mothers postoperatively and for high-risk infants. Only the Faculdade de Medicina appears to have a section rate that is comparable with other hospitals reporting in Brazil. At Alexander Fleming and Enfermaria 33, the rates are high but not unreasonable. The 80% rate at the Casa de Portugal cannot be clinically justified, but may specifically reflect the high socioeconomic level of Brazilian obstetric patients. Although no deaths were reported in this series, continued exposure of mothers and babies to the additional risks of abdominal delivery for no apparent reason may not be warranted.

Abdominal delivery is sometimes rationalized when the patient has requested a tubal ligation. In this series, no woman at any of the four hospitals who was not delivered abdominally received a tubal ligation. In two of the four hospitals, Casa de Portugal and the Faculdade de Medicina de Campos, a majority of patients planning sterilization were sterilized during admission for the delivery (87.8% and 82.9%, respectively). The corresponding proportion at the other two hospitals was 35.9% at the Alexander Fleming and 43.3% at the Enfermaria 33. Presumably, other sterilizations were done when the patient returned for follow-up care. Twelve patients who were sterilized had no apparent indications for cesarean section (four at Alexander Fleming and eight at the Casa de Portugal, none at either the Enfermaria 33 or the Faculdade de Medicina). Thus, it would appear that this alone is rarely the reason for cesarean section in these hospitals. However, it may encourage the obstetrician to deliver abdominally when other indications are not pressing.

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