

# Changes in Cesarean Delivery in an Italian University Hospital, 1982–1996: A Comparison with the National Trend

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**ABSTRACT: Background:** *The cesarean delivery rate in Italy rose dramatically from the mid-1970s to 1996, accounting for 22.4 percent of all deliveries in the last national survey. The aim of this study was to analyze the results of the clinical practice of a new staff in the Department of Obstetrics and Gynecology of a university hospital, with particular focus on the application of common protocols. The rates of cesarean sections and perinatal mortality were chosen as parameters for good clinical practice and were compared with national data. Methods:* *A new staff assumed the obstetric management at the hospital in 1982. Standardized protocols were implemented for all major indications for cesarean delivery (repeat cesarean section, dystocia, breech presentation, fetal distress). Results:* *The rate of cesarean deliveries decreased from 26.4 to 12 percent and remained stable during the past decade. Other operative modalities were used for approximately 1.5 percent of deliveries. The perinatal mortality decreased to 0.5 percent in 1994. To confirm whether or not staff followed common protocols, a review of three years (1994–1996) showed a fairly stable frequency of cesarean sections on different days and nights during the week, confirming the homogeneity of obstetric management. Conclusions:* *Our data showed that, irrespective of the local situation and of the risks of litigation, a significant reduction of cesarean sections can be achieved in a tertiary care center without detrimental effects on newborns, especially in a teaching hospital where residents are trained. Despite national trends suggesting the contrary, some women may choose to deliver in an obstetrics department with better care and fewer operative procedures than in hospitals with higher cesarean delivery rates. (BIRTH 26:3 September 1999)*

In Italy a sharp rise in the cesarean delivery rate was observed from the mid-1970s, continuing throughout the 1980s and 1990s (1). This trend also occurred in

the United States in the 1970s and 1980s (2), but in contrast with North America and other European countries (3), in the last decade no stabilization of this trend was observed in Italy. In the United States the cesarean delivery rate declined between 1988 and 1994, but data from 1994 through 1996 suggest that this decline may have stalled, and the overall cesarean birth rate was 21.8 percent in 1996 (4).

During the 1970s a rise in the frequency of all four major indications for cesarean sections occurred worldwide (repeat cesarean, dystocia, breech presentation, fetal distress) (5). In the early 1980s some authors claimed that the increased use of cesarean section represented a major factor in reducing perinatal mortality (6), but others described an increased maternal and infant health risk associated to this mode of delivery

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when the procedure was performed for inappropriate indications (7).

Several Italian obstetricians have expressed more concern about possible litigation due to unrecognized fetal distress and the attendant sequelae than about objective data on maternal and neonatal outcome. In addition, because of a different health care system, Italian obstetricians, even those who work in public hospitals, are usually not concerned about the costs to patients and the community of a prolonged hospital stay due to cesarean delivery, since these expenses are covered by the national health care system. In North America women with private insurance who go to private hospitals have a higher probability of cesarean delivery than the general population (8).

This report presents the rate of cesarean delivery by maternal characteristics and fetal outcome from 1982 to 1996 at a university hospital, compares these results with those reported by a recent national survey, and suggests some conclusions about the differences observed. The purpose of the study was to analyze the results of the clinical practice of a new staff, with particular focus on the application of common protocols, and to compare outcomes with national data.

### Materials and Methods

In 1982 a new staff was appointed to be in charge of the Department of Obstetrics and Gynecology of the San Gerardo di Monza Hospital in Monza, Italy. Of the 803 deliveries in the previous year, 212 (26.4%) were cesarean sections. No relevant change occurred in the population that was referred to our hospital during the 1980s. In particular, no migration to our community took place until the early 1990s, when the number of women coming from Africa, Asia, and South America progressively increased as a result of a national trend of immigration.

In contrast with previous years, standardized protocols were implemented for the management of vaginal birth after cesarean section (VBAC) for the management and early recognition of fetal distress and for dystocia. Moreover, since 1988, all pregnant women with sonographically confirmed breech presentation at 36 weeks' gestation were eligible for an attempt of external cephalic version performed between 36 and 38 weeks' gestation.

For women with one previous cesarean birth, vaginal delivery was routinely attempted, and fetal well-being was assessed by means of external electronic fetal monitoring. Fetal monitoring was standardized during labor. Labor of women with low-risk pregnancies was monitored by simple auscultation performed by a physician or midwife every 15 to 20 minutes, before, during, and immediately after a contraction. Continuous monitoring was used for fetal heart rate

abnormalities. Continuous electronic fetal monitoring was used for induced labor and for all cases of high-risk labor (e.g., preterm labor, hypertension, abnormalities of the amniotic fluid). From 1993 to the present, biochemical assessment of fetal well-being, by measuring the pH from a scalp blood sample, was also performed.

Cervical dystocia was treated by administration of oxytocin, 5 units in a litre of 5 percent glucose. The rate of infusion began at 2 drops per minute and was doubled progressively (up to 64 drops/min) every 20 minutes until adequate uterine activity was achieved. This tentative schedule was tailored to each individual.

From 1982 to 1992, pregnancies at term were monitored by means of amnioscopy performed every second day up to the 42nd week. Since 1993, pregnancies at term have been monitored by means of biophysical scores and evaluation of the amniotic fluid index until 42 weeks' gestation, unless pathologic findings occurred. For each pathologic condition standardized protocols were followed (9).

Induction of labor was performed by means of amniorrhexis, oxytocin, or both until 1987. From 1988 induction was achieved by means of intravaginal application of prostaglandin E<sub>2</sub> if cervical conditions were partially favorable (Bishop score > 4) and by means of amniorrhexis if conditions were favorable (Bishop score > 6). For slow cervical dilation, intra-cervical application of prostaglandin E<sub>2</sub> preceded the induction of labor.

Data about each delivery and each woman were available from hospital records. To determine the rate of cesarean sections during the week and at different hours during the day and to determine staff compliance with the protocols in the department, data about all women who delivered in 1994, 1995, and 1996 were analyzed.

Perinatal morbidity and mortality were defined according to international standards (10). In addition, since 1984 a course of psychoprophylaxis was offered to all pregnant women. Its purpose was to provide information about labor practices in our department, and to reduce the women's anxiety by discussing problems and fears about labor and delivery. These courses were attended by approximately 25 percent of women in 1996.

### Results

Since 1982, the cesarean delivery rate in our department decreased to 12.1 percent, and it has remained substantially stable in the last 12 years (Table 1). The primary indications for cesarean sections in the last three years are described in Table 2. These data show the low frequency and homogeneous distribution of the indications of cesarean section for fetal distress

(range = 4.09–4.66%) and for dystocia (range = 2–3%).

When congenital malformations were excluded, the perinatal mortality decreased from 2 percent in 1982 to less than 1 percent in the 1990s (Table 3). In the same period the national frequency of cesarean sections rose from 11.2 percent in 1980 to 22.4 percent in 1992 (10). The national perinatal mortality was 1.1 percent in 1991.

We observed that in the obstetric department of our hospital, the rate of cesarean sections was stable during the working days (range = 11.6–13.9%) and it was relatively lower on Sundays (9.7%) (Table 4). This finding reflects the common policy of inducing most planned cases and of performing elective cesarean sections during business days. In contrast, the number of unplanned cesarean deliveries was stable during the week.

When the distribution of cesarean sections throughout a 24-hour period was examined, we observed that slightly more cesarean sections were performed during the daytime, reflecting the impact of elective cesarean

sections (Table 4), whereas cesarean sections after trial of labor were approximately similar during the day and night. On Sundays, when planned elective cesarean sections were usually not performed, we observed that the number of cesarean sections performed during the night approximately equaled the number of those performed during the day.

## Discussion

Apart from the medical reasons, different social and cultural patterns may provide an explanation for the high rate of cesarean deliveries in Italy. As recently documented (11), Italy has moved from a traditional family pattern characterized by an elevated parity to a typical three- to four-member family, and the national birth rate of Italy is now one of the lowest in Europe (11). At the same time the average age for a first pregnancy has moved from the early 20s to the late 20s and early 30s in the last 20 years. These factors provide some explanations for the great number of “high-premium babies” delivered in Italy. We do not

**Table 1. Operative Deliveries, 1982–1996**

Procedure	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Del	1420	1833	1794	1854	1794	1947	2079	2161	2325	2406	2482	2586	2683	2674	2880
CS	172	223	221	279	239	250	292	335	349	334	320	290	319	346	376
% CS	12.1	12.2	12.3	15	13.3	12.8	14	15.5	15	13.9	12.9	11.2	11.9	12.9	13
VE	35	34	50	29	23	34	39	39	44	29	33	15	35	40	45
% VE	2.5	1.9	2.8	1.6	1.3	1.7	1.8	1.7	1.9	1.3	1.4	0.6	1.3	1.5	1.6

Del = deliveries; CS = cesarean sections; VE = vacuum extractions.  
Note: During the study period, four forceps extractions were performed.

**Table 2. Indications for Cesarean Sections (1994–1996)**

Indications	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Fetal distress	52	46	49	47	52	55	49
Dystocia	34	27	27	35	24	29	29
Previous CS	–	11	8	6	10	8	6
Breech	11	27	31	30	25	36	16
Other	13	33	27	24	29	36	21
Total	110	144	142	142	140	164	121

CS = cesarean sections.

**Table 3. Perinatal Mortality (Congenital Malformations Excluded)**

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Del	1431	1850	1806	1872	1815	1957	2099	2185	2336	2432	2515	2624	2730	2711	2914
PM	28	23	30	29	19	20	13	8	17	19	17	12	14	22	21
% PM	2	1.2	1.7	1.6	1	1	0.6	0.4	0.7	0.8	0.7	0.5	0.5	0.8	0.7

Del = deliveries; PM = perinatal mortality.

**Table 4. Daily Frequency of Cesarean Section by Hour of Day and Day of Week (1994, 1995, and 1996)**

<i>Procedure</i>	<i>Sunday</i>	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>	<i>Saturday</i>
Total deliveries	1131	1113	1174	1111	1208	1179	1197
CS after labor	65	51	51	58	57	56	62
Elective CS	45	93	91	84	83	108	59
CS in labor							
8AM–8PM	27	35	16	27	26	31	29
8PM–8AM	35	30	35	24	32	26	27
Elective CS							
8AM–8PM	38	27	71	66	66	71	85
8PM–8AM	21	18	22	25	18	12	23

CS = cesarean sections.

believe that some babies are more valuable than others, but we recognize that the expectations and anxiety for certain pregnancies are higher than for others.

The traditional religious background of the Italian population has also changed radically in the last three decades, creating a change in the attitude toward birth and the appreciation of new life. Given these national characteristics, the increase in the cesarean delivery rate is not surprising. This background, in fact, predisposes the general population to have incomplete information about cesarean delivery. Vaginal delivery is symbolically related to the fear of possible risks to the fetus, and nonhealth professionals may believe inaccurately that intervention procedures will reduce maternal and neonatal risks. In addition, cesarean delivery is often perceived as a painless mode of delivery, compared with the “terrible” pain related to vaginal delivery.

Several authors have highlighted the importance of the physician factor in the cesarean section decision (12). In Italy the rate of cesarean sections is significantly higher in private hospitals (28.5%) than in public hospitals (21.5%) (11). Nevertheless, accurate and objective information, adequate psychoprophylaxis, and observance of standardized protocols for repeat cesarean sections, dystocia, and fetal distress may reverse the tendency toward increased cesarean deliveries, even in a teaching hospital with a high rate of high-risk pregnancies.

The management of different clinical situations, such as postterm pregnancy, monitoring of fetal well-being, and induction of labor has evolved in the last decade, according to the state of the art. This evolution has allowed a progressive improvement of the fetal outcome in our obstetrics department as in others, but has affected only marginally the frequency of cesarean births over the years. In particular, due to logistics, the frequency of elective cesarean sections during the day is higher from Monday to Friday and lower during the weekend. The frequency of elective procedures during the night remains generally stable, and the fre-

quency of unplanned cesarean sections is stable through the week and does not differ between day and night. Different indications for cesarean sections remain substantially stable through the week.

It is difficult to obtain reliable data about the indications for cesarean sections in Italy. However, our experience demonstrates that it is possible to keep the indications for cesarean deliveries sufficiently low by admitting all patients to a trial of labor who do not have an absolute contraindication, and by avoiding an a priori judgment of the possibility of a vaginal delivery (e.g., in cases of cephalopelvic disproportion or fetal macrosomia). In addition, the implementation of biochemical techniques for the assessment of fetal well-being in labor may provide useful information and reduce the number of unnecessary cesarean births.

Women who have a trial of labor require careful observation. For instance, we have observed that the presence of a midwife provides an invaluable aid in the management of labor and reduces a woman's anxiety. The compliance of staff with commonly accepted and discussed protocols reduces the subjectivity of obstetric management, including unacknowledged decisions based on personal wishes of the physician rather than on real clinical indications.

Clinicians might wonder how unanimity was reached in the management of controversial cases. In fact, absolute unanimity was never achieved, and personal or professional opinions were respected. Nevertheless, one must consider that the organization of an obstetrics department in Italy depends more on the guidelines of the chief of obstetrics than in North America. Therefore, the chief was directly responsible for the choice of certain practices and management. Daily and weekly meetings were also implemented, and all controversial cases were discussed, leading to a progressive acceptance of the protocols, with changes proposed based on the daily practice.

The new staff members in subsequent years, with few exceptions, received their training locally and were accustomed to our protocols. The routine audit of all

births and a collegial discussion of all complex cases represent useful and essential steps for continuing education of all professionals.

From 1982 to 1996 we recorded a steady increase of births in the obstetrics department in this hospital. When some demographic data of our patients were analyzed in later years, we observed that an increasing proportion of women chose to deliver in our hospital, despite belonging to communities elsewhere, and this increase in births corresponded with a decrease in births at other hospitals in the region. This finding raises the interesting observation that a decrease of operative procedures and an increase of vaginal deliveries, when associated with an improvement in care, do not necessarily correspond with a decrease in acceptance of the childbearing population. There are obvious consequences with respect to the current competition for patients in private and public institutions. We believe that our data offer support for the efforts of individual practitioners and groups to reduce the need of unwarranted interventions in obstetrics, irrespective of country.

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