Obstetric Consultations During Labor and Delivery in a University-Based Family Practice

Allen S. Craig, MD, Alfred O. Berg, MD, MPH, and C. Richard Kirkwood, MD
Seattle, Washington

This study retrospectively examined the use of obstetrical consultants by family medicine residents and faculty at the University of Washington Hospital from July 1, 1980, to June 30, 1981. Of 125 deliveries, 104 (83 percent) were vaginal deliveries, 99 percent of which were performed by the family physician involved. There were 21 (17 percent) cesarean sections.

Before the audit began, 13 complications of labor and delivery were established as criteria suggesting the need for consultation. Medical records were retrospectively examined for complications meeting these criteria. Formal consultations occurred in 32 percent of all deliveries. Of the patients with at least one of the 13 complications, 75 percent had consultations obtained. Patients with these complications had intrapartum risk scores that were significantly higher than patients without the listed complications. Apgar scores at 1 and 5 minutes were significantly lower in the group of patients meeting the consultation criteria (7.0 vs 8.0 at 1 minute; 8.3 vs 9.0 at 5 minutes).

The criteria successfully identified a group of high-risk patients and could be an appropriate guide for decision making in the specific setting studied. Patients without one of the predetermined complications had a low rate of surgical intervention (cesarean section or midforceps deliveries); the negative predictive value was 98 percent.

The pivotal role of obstetrics in family-oriented practice has been emphasized since the inception of family practice residency programs.[1] Mehl and co-workers[2] surveyed four group practices and found that the two including obstetrics were subjectively more satisfying for the physician and contained more pediatrics, gynecology, orthopedics, and minor surgery than did those without obstetrics. This perceived importance of obstetrics notwithstanding, there have been questions raised

From the Department of Family Medicine, University of Washington School of Medicine, Seattle, Washington. Requests for reprints should be addressed to Dr. Allen S. Craig, Shiprock Hospital, PO Box 160, Shiprock, NM 87420.

Table 1. Predetermined Criteria for Obstetrical Consultation and Their Incidence in 125 Deliveries by Family Physicians

Criteria for Obstetrical Consultation	Incidence
Prolonged second stage (≥ 2 hr)	16
Abnormal presentation (breech, transverse, extremity)	6
Emergencies (hemorrhage, prolapsed cord)	4
Heavy meconium-staining of amniotic fluid	3
Prematurity (gestational age < 34 wk)	3
Prolonged first stage (multipara ≥ 16 hr; primipara ≥ 24 hr)	3
Antepartum cephalopelvic disproportion	2
Late deceleration of fetal heart tones	1
Premature rupture of membranes (> 24 hr)	1
Severe preeclampsia (systolic blood pressure > 160 mmHg or diastolic blood pressure > 110 mmHg)	1
Abnormal position (face, mentum anterior)	0
Scalp pH < 7.2	0
Severe variable decelerations (> 30-min duration)	0

about the safety of obstetrics performed by general and family physicians.[3,4] Others have shown that delivery outcomes are as good or better in deliveries performed by family physicians compared with deliveries performed by obstetricians.[5-9]

One aspect of obstetrical care that is part of this ongoing debate is the use of obstetrical consultants during labor and delivery. All but the most highly trained family physicians must depend on assistance for certain complications during this crucial phase of pregnancy. There is very little literature on this phase of management or the criteria one should use to determine whether consultation is indicated.

James,[10] a British obstetrical resident, studied the transfer of patients in labor from general practitioner hospitals without obstetricians to obstetrical referral centers, finding that 17.5 percent of patients were transferred in labor. Complications necessitating transfer included meconium-stained amniotic fluid, preeclampsia, or fetal distress. James' study population may be comparable to some rural practices in this country where surgical and obstetrical assistance is not readily available. There is little information on how often family physicians in this country request assistance or transfer patients to the care of obstetricians during in-hospital labors.

This study examines the use of obstetrical consultants by family physicians managing labor at a university-based family practice residency program. It also serves as follow-up to the study by Ely et al,[7] which examined the same residency's obstetrical practice from 1972 to 1975.

Methods

All patients followed prenatally at the Family Medical Center at University Hospital, Seattle, Washington, and delivered of their babies between July 1, 1980, and June 30, 1981, were subjects selected for retrospective review of medical records. Patients were managed in labor by the family practice resident or attending physician who followed them prenatally or by the family practice resident on call. All cesarean sections required obstetrical consultation and were performed by obstetrical staff, assisted by the family physician involved.

Medical records were examined for demographic data, types of deliveries, complications, intrapartum risk scores, and Apgar scores. The in-

trapartum risk scores were calculated by the delivering physician based on an intrapartum risk form in use at the hospital and reflected the severity of complications encountered during labor and delivery.*

Thirteen criteria were selected a priori that were felt to mandate an obstetrical consultation (Table 1). This list of complications was developed by the authors based on available research[10] and modified after discussions with family medicine faculty. Records were examined for complications that met one or more of the criteria and to determine whether obstetrical consultation was obtained.

Statistical comparison of mean risk and Apgar scores was performed using the Student's *t* test.

Table 2. Comparison of Delivery Type and Apgar Scores in Two Studies of the Same Practice

Delivery Type	Current Study (1980-1981) No. (%)	Ely Study (1972-1975) No. (%)
Spontaneous vaginal	86 (68.8)	74 (66.7)
Forceps	17 (13.6)	24 (22.6)
Cesarean section	21 (16.8)	7 (6.3)
Vacuum extraction	1 (0.8)	6 (5.4)
Apgar (1 min)	7.7	7.5
Scores (5 min)	8.8	8.8

Results

There were 125 deliveries performed during the study period. The average patient age was 26 years, 94 (75 percent) were married, and 74 (59 percent) were primiparous. The average gestational age was 40 weeks. This population was considered to be at higher than average risk because of the large number of single mothers and the overall higher risk patients served by University Hospital.

There were 86 (69 percent) spontaneous vaginal deliveries, 17 (14 percent) forceps deliveries (including one midforceps), and 21 (17 percent) cesarean sections (Table 2). One vacuum extraction was performed. Family physicians performed 82 percent of deliveries or 99 percent of all non–cesarean-section deliveries. Apgar scores averaged 7.7 and 8.8 at 1 and 5 minutes, respectively.

Formal obstetrical consultation was obtained for 40 (32 percent) patients. The number of patients meeting each consultation criterion is listed in Table 1. Several patients had more than one criterion for consultation. There were 13 patients who had formal consultations not indicated by the criteria. Consultations were indicated in 36 (29 percent) deliveries. In this group, 27 (75 percent) had consultations obtained by the physicians managing the labor. This high-risk group had several patients with low Apgar scores (less than 7) and one neonatal death of a premature infant. The average risk scores of the 36 patients who had consultations indicated was 6.1, compared with 1.8 in the 89 patients without complications indicating consultation ($t = 6.8$, $P < .01$). The mean 1-minute Apgar score of the group with consultations indicated was 6.9, compared to 8.0 in the group that did not have consultations indicated ($t = 3.2$, $P < .01$); the mean 5-minute Apgar score was 8.3 in the former group and 9.0 in the latter group ($t = 3.7$, $P < .01$).

The subgroup of nine patients who had consultations indicated but not obtained included six patients who had the second stage of labor lasting two or more hours. These nine patients had an average recorded risk score of only 1.7, which was falsely low, as the score for this complication was 3 on the risk-scoring sheet used. There was one low Apgar score of 6 at 1 minute and no neonatal deaths in this group. There was no statistical difference between the Apgar scores of this subgroup of nine patients and the 27 patients who had consultations indicated and obtained. The average 1-minute Apgar score in these nine patients was 7.9 vs 6.6 in the 27 high-risk patients with consultations indicated and obtained ($t = 1.4$, $P < .10$); the average 5-minute Apgar score of these nine

*Copies available from the author upon request.

		SURGICAL INTERVENTION	
		Present	Absent
CONSULTATION INDICATED BY CRITERIA	Yes	20	16
	No	2	87

Positive predictive value = 56%
Negative predictive value = 98%

Sensitivity = .91
Specificity = .84

Figure 1. Surgical intervention vs consultation criteria

patients was 8.8 compared with 8.1 for the latter group ($t = 1.1$, $P < .15$).

In the group of 89 patients who did not have consultations indicated, 13 (15 percent) had consultations for a variety of reasons including mild preeclampsia, terminal bradycardia, abnormal labor curve, or history of prior cesarean section. These 13 patients had a mean risk score of 3.8, which was statistically lower than the patients who had consultations indicated and obtained who had risk scores of 7.3 ($t = 2.4$, $P < .01$). These 13 patients had a 1-minute Apgar score of 7.6, which was not statistically different from the 6.6 score in the group of 27 patients with consultations indicated and obtained ($t = 1.3$, $P < .10$); the 5-minute Apgar score of 8.9 in these 13 patients was likewise not statistically different from the 8.1 for the latter group ($t = 1.5$, $P < .10$). There were no neonatal deaths and there was one low Apgar score of 6 at 1 minute among these 13 patients.

The most common complication observed was the second stage of labor two or more hours in duration. Only 40 percent of these patients had formal consultations obtained. There were 14 patients who had this complication alone. Their mean 1-minute Apgar score of 7.6 was not statistically different from the 8.1 score of the 76 low-risk patients who did not have consultations indicated or obtained ($t = 1.1$, $P < .15$); the 5-minute score of 8.8 was likewise not statistically different from 9.0, the score for the low-risk group ($t = 1.2$, $P < .15$).

The relationship between major surgical intervention (cesarean section or midforceps deliveries) and the presence of criteria for consultation is illustrated in Figure 1. The positive predictive value was 56 percent. The negative predictive value was 98 percent; that is, if consultation was not indicated by the criteria, a major complication occurred in only 2 of 89 deliveries. The sensitivity and specificity were .91 and .84, respectively.

Discussion

This study sought to determine how often and for what reasons family physicians needed the assistance of obstetric consultants during labor and delivery. The 32 percent consultation rate was high, though probably appropriate for the university hospital setting. The consultation rate would undoubtedly be less in a lower risk population or in a practice where cesarean sections were performed by family physicians.

The criteria for consultation used in this study seemed appropriate for the setting, as they successfully identified a group of high-risk patients with a high complication rate and lower Apgar scores. The criteria did not, however, identify all high-risk patients, as there was a group of patients who had consultations obtained, though consultations were not indicated by the criteria. These 13 patients had a variety of problems that did not fit one specific risk category. Their risk scores were statistically lower than the 27 patients who had consultations indicated and obtained. In contrast, the Apgar scores of these 13 patients were not statistically better than those who had consultations indicated by the criteria. That these patients with Apgar scores similar to the highest risk group of patients were not identified by the criteria used is of concern, in spite of their lower risk scores.

The only poor outcomes occurred in the patients who were identified by the criteria and had consultations obtained. The group of nine patients who had consultations indicated though not obtained had no untoward events, though one low Apgar score of 6 at 1 minute was recorded. Given

the outcome data and risk scores for the subgroups studied, it is not possible to demonstrate that obtaining a consultation actually improved the outcomes. It is clear that the majority of patients who had consultations obtained were high-risk patients with higher risk scores and lower Apgar scores. Showing a difference in outcome with and without consultation would require matching patients for similar complications who did and did not have a consultation obtained.

Caution must be used in interpreting these data. The unique setting of deliveries done at a tertiary care obstetrics unit staffed by obstetrical house staff must be kept in mind. The high-risk nature of the patient population and the restrictions on the practicing physicians have already been mentioned. It should also be noted from the authors' experiences that there is a high rate of informal consultation among family medicine and obstetric house staff. One could argue, however, that if these interactions were not formally recorded in the medical record, they were not of major importance in managing the patients involved.

The predetermined consultation criteria had a very high negative predictive value (98 percent) for major surgical intervention (cesarean section or midforceps deliveries). The use of criteria that would distinguish a group of high-risk patients requiring surgical intervention would be very helpful, particularly in isolated rural areas. Unfortunately, the criteria used in this study did not, for the most part, predict problems at the beginning of labor, but rather identified a group of high-risk or low-risk patients after the labor was completed.

The most common complication that fit a predetermined criterion was the second stage of labor two or more hours in duration. Interestingly, 40 percent of these patients did not have consultations obtained, and physicians often did not list a long second stage of labor as a risk factor when completing the risk score sheet after delivery. This group of patients appears not to be at higher risk for poor outcomes when Apgar scores alone are used to measure outcome. These data suggest that the physicians involved were often managing these labors independently. It may also show a reluctance to intervene with forceps or surgery. The safety of this approach cannot be assessed based on these data alone.

In comparing the current study to that of Ely et al in 1976,[7] there has been nearly a tripling of the cesarean section rate and a decrease in forceps deliveries by almost one third (Table 2). These changes reflect the national trend of increased cesarean section rates, which may be related to increased fetal monitoring and the use of epidural anesthesia. It seems unlikely that there was a significant change in the risk grouping of the populations studied.

Further research elucidating the consultation process in family medicine is needed. A similar study performed in a more representative rural or urban practice would be useful. Such a study would aid in the development of consultation criteria that could serve as a practical clinical tool in a given practice setting. As long as obstetrics remains an integral part of family practice, there is a need for an increase in the research data base that supports this role.

References

1. Geyman JP: Obstetrics and family practice: Conflict in medical education? Some approaches to problem areas. J Reprod Med 1974; 12:59-63

2. Mehl LE, Bruce C, Renner JH: Importance of obstetrics in a comprehensive family practice. J Fam Pract 1976; 3:385-389

3. Curzen P, Mountrose UM: The general practitioner's role in the management of labour. Br Med J 1976; 2:1433-1434

4. Caetano DF: The relationship of medical specialization (obstetricians and general practitioners) to complications of pregnancy and delivery, birth injury, and malformation. Am J Obstet Gynecol 1975; 123:221-227

5. Mehl LE, Peterson GH, Whitt M, Hawes WE: Outcomes of elective home births: A series of 1,146 cases. J Reprod Med 1977; 19:281-290

6. Konig JH: The obstetrical experience of 20 years in one family practice. J Fam Pract 1982; 14:163-171

7. Ely JW, Ueland K, Gordan MJ: An audit of obstetrical care in a university family medicine department and an obstetrics-gynecology department. J Fam Pract 1976; 3: 397-401

8. Wanderer MJ, Suyehira JG: Obstetrical care in a prepaid cooperative: A comparison between family practice residents, family physicians, and obstetricians. J Fam Pract 1980; 11:601-606

9. Phillips WR, Rice GA, Layton RH: Audit of obstetrical care and outcome in family medicine, obstetrics, and general practice. J Fam Pract 1978; 6:1209-1216

10. James DK: Patients transferred in labour from general practitioner maternity units. J R Coll Gen Pract 1977; 27:414-418