
Practice Variations Between Family Physicians and Obstetricians in the Management of Low-Risk Pregnancies

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Background. Studies suggest that family physicians and other generalist physicians practice differently than specialists. This study was performed to determine whether practice patterns and outcomes differ for women with low-risk pregnancies who obtain maternity care from family physicians as compared with those who are cared for by obstetricians.

Methods. A retrospective chart review was performed at five sites across the United States. Women who presented for elective repeat cesarean section or who had any one of 14 high-risk conditions were excluded from the analysis. The final sample analyzed included 4865 women. Family physicians managed the labor of 2000 of these women, and obstetricians managed 2865.

Results. During intrapartum care, women managed by family physicians were less likely to have their labor induced (8.6% vs 10.4%, $P=.03$), receive oxytocin augmentation (14.9% vs 17.8%, $P=.006$), or receive epidural anesthesia (5.4% vs 17.0%, $P<.001$) as compared with those managed by obstetricians. Delivery outcomes showed that patients of family physicians were less likely to have an episiotomy during vaginal delivery (53.7% vs 74.5%, $P<.001$) and a lower frequency of cesarean sec-

tion deliveries (9.3% vs 16.0%, $P<.001$), especially for cephalopelvic disproportion. When adjusted for potential confounders, rates for cesarean section and episiotomy for obstetricians were still significantly higher than those of family physicians. For neonatal outcomes (low 1-minute Apgar score, neonatal intensive care unit admission, birth trauma, or neonatal infection), no significant differences were found between the care delivered by obstetricians and family physicians.

Conclusions. Women obtaining maternity care from family physicians were less likely to receive epidural anesthesia during labor or an episiotomy after vaginal births, and had a lower rate of cesarean section delivery rates, primarily because of a decreased frequency in the diagnosis of cephalopelvic disproportion. Differences between outcomes persisted after adjustment for potential confounders such as parity, previous cesarean delivery, and use of epidural anesthesia during labor. No differences between the two physician groups with respect to neonatal outcomes were found.

Key words. Pregnancy; labor; cesarean section; family practice; family physicians; maternity care; episiotomy; pregnancy outcome. (*J Fam Pract* 1995; 40:345-351)

Variation in the practice styles and patient populations of generalist and specialist physicians has suggested that these groups treat similar disorders differently. For a number of common medical conditions, evidence from studies

such as the Medical Outcomes Study¹ substantiates this hypothesis. Despite similar initial presentations, generalist physicians¹ and, in particular, family physicians² are more conservative in their use of medical technology and medical interventions as compared with specialists.

The utilization of medical technology is an important issue in maternity care.^{3,4} With increasing emphasis being placed on the high rate of cesarean section deliveries in the United States,⁵ health planners are beginning to focus on methods to limit the unnecessary use of interventions in the management of labor and delivery.

Family physicians and obstetricians both deliver

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Table 1. Characteristics of Participating Sites

Characteristic	Site				
	A	B	C	D	E
Ownership	Private	Private	Private	Private	Public*
Location	Urban	Rural	Suburban	Urban	Rural
State	Michigan	Kentucky	New York	South Dakota	North Carolina
Obstetrics medical staff					
Obstetricians	60	3	14	14	19
Family physicians	51	6	33	27	5
Medical residents					
Obstetrics	28	0	0	0	12
Family practice	36	6	24	18	36
Teaching services offered†					
Obstetrics	Yes	No	Yes	No	Yes
Family practice	Yes	Yes	Yes	Yes	Yes

*Site E also served as a medical school primary teaching site.

†Teaching service refers to a service in which residents of either specialty were supervised by an obstetric or a family practice attending physician.

high-quality maternity care,⁶⁻⁸ but evidence suggests that family physicians and obstetricians have differing styles of practice.⁹ Studies examining the use of interventions such as oxytocin, episiotomy, and cesarean delivery among family physicians as opposed to obstetricians have yielded conflicting results.¹⁰⁻¹⁵ Some studies have shown associations between interventions and specialty,^{16,17} while others have failed to confirm these findings. Inconsistencies in results from other studies may stem from institutional differences in the approach to maternity care,¹⁸ as well as variations in the patient populations of these two physician groups.^{19,20}

This study explores the management of labor and delivery by family physicians and obstetricians in a variety of settings while controlling for patient-risk status. Since the severity of high-risk conditions can vary, low-risk pregnancies were selected to allow for a comparison of similar populations. The intent of this study was to determine whether family physicians who practice maternity care are less likely than obstetricians to perform interventions in low-risk pregnancies. If family physicians are less likely to intervene, it is possible that differences in the use of technology among specialists are not limited to the problems addressed in the Medical Outcomes Study.¹

Methods

Sample

A retrospective review of deliveries was performed using a random sample of women who gave birth at five participating hospitals. Characteristics of the participating hos-

pitals are shown in Table 1. Four of these institutions were community hospitals that also served as training sites for residency training in family practice or obstetrics or both; the fifth was a community hospital that also served as the primary teaching facility for a state-funded medical school. At any site where maternity training programs were offered only by family practice departments, trainees worked with both family physicians and obstetricians.

Using a computer-generated random number list, 80 women from each hospital were identified for each month during 1990 and 1991. When fewer than 80 women gave birth in a given month, all patients were included in the sample. Since this analysis focuses on the course of management of labor in patients with low-risk pregnancy attempting a vaginal delivery, all patients who received an elective repeat cesarean section or who were transferred during labor to a hospital from another facility were excluded from analysis.

The sample size of 80 patients per month was selected to assure that at least 1250 charts would be sampled at each site. With this degree of sampling, analysis for each site would yield a power of 80% to detect a 33% difference in cesarean frequency, given a frequency of at least 12% in the obstetrician group.

An initial sample of 8647 patients were reviewed; 772 (8.9%) who had been admitted for elective cesarean sections were excluded, along with another 8 who gave birth outside the hospital. An additional 500 (5.9%) patients were excluded because their initial labor and delivery care had been supervised by a nurse midwife (n=491) or a physician other than a family physician or obstetrician (n=9). The final sample that was reviewed included 7367

patients whose maternity care was provided by 178 family physicians and 181 obstetricians.

Since the intent of this study was to examine labor and delivery management and outcomes in low-risk pregnancies, women with high-risk conditions were excluded from further analysis. Conditions considered high-risk were: age over 40 years, previous fetal or neonatal death, hypertension or preeclampsia, preexisting or gestational diabetes mellitus, preterm labor or preterm rupture of membranes, active herpes genitalis, drug or alcohol abuse, deep vein thrombosis, polyhydramnios or oligohydramnios, placental abruption, chronic renal failure or heart failure, placenta previa, multiple gestation, and intrauterine growth retardation. The final sample included 4865 women, 2000 of whom were managed in labor by family physicians and 2865 of whom were managed by obstetricians.

Variables

Patient and newborn records were retrieved for all deliveries and abstracted by trained research assistants. On the maternal hospital charts, which also included prenatal records, there was no indication that any patient had not received prenatal care. Patient demographic and obstetric history data were recorded along with details of the current labor and delivery. The presence or absence of 45 specific risk factors was recorded.

Specific diagnoses, such as the reason for delivery by cesarean section, were based on the primary diagnosis of the attending physician. When more than one diagnosis was given for a procedure, which occurred in less than 1% of all cases, the chart was reviewed by an independent clinician, who selected one diagnosis as the primary one. Because of the overlap in the clinical definition of cephalopelvic disproportion, failure to progress, and dystocia, these diagnoses were grouped together into a single category called "cephalopelvic disproportion/dystocia."

Patients were categorized based on the specialty of the physicians who admitted them to the hospital and initially assumed supervision of the care they received during labor and delivery. This categorization was necessary for two reasons: (1) to avoid bias from intrapartum referral of patients with high-risk pregnancies who might be at increased risk of giving birth by cesarean section; and (2) referral of patients from family physicians to obstetricians specifically for cesarean section delivery. This second reason is particularly important since only two family physicians in this study performed cesarean sections.

Because of potential bias resulting from referral of patients with a high likelihood of requiring delivery by cesarean section from family physicians to obstetricians, additional analysis was performed based on the specialty

of the physician with whom the patient initiated prenatal care. This information was obtained by means of carefully examining prenatal records to determine whether the patient was referred by one physician to another before the onset of labor.

To examine neonatal outcomes, a number of infant-related variables also were examined. Birthweight was recorded from the neonatal record; if measured in pounds, it was converted to grams. Birth trauma was defined as any cephalohematoma or other injury sustained during the birth process, as determined at the time of the infant's initial physical examination. Admission to the neonatal intensive care unit and neonatal infection were broadly defined to include any use of the intensive care unit or any infection during the peripartum period, respectively.

Data Analysis

Bivariate comparisons of patients who gave birth by cesarean section and those who did not were performed using the chi-square statistic and *t* test. Because of differences in the populations at different sites, Mantel-Haenszel summary chi-squares were used in the analysis of demographic variables. Because of evidence that cesarean section rates are higher among primiparous women,²¹ women who have had previous cesarean sections,²² and women receiving epidural anesthesia for intrapartum pain control,^{23,24} stepwise logistic regression was performed for the outcome of cesarean section delivery. Provider specialty, primiparity, previous cesarean section, epidural use, and insurance status were included as independent variables; delivery by cesarean section was the dependent variable. Regression analysis was performed using True Epistat software.²⁵ Statistical significance was defined as $P < .05$.

Results

The demographic composition of the patient populations managed by obstetricians and family physicians showed that a higher percentage of patients managed by family physicians were nonwhite (weighted odds ratio [OR]=1.77, 95% confidence interval [CI] 1.43 to 2.26, $P < .001$) and that they were less likely to have private insurance (OR=0.57, 95% CI 0.45 to 0.60, $P < .001$) or to be married (OR=0.40, 95% CI 0.33 to 0.45, $P < .001$). Patients managed by family physicians were also slightly younger as compared with patients of obstetricians (25.3 ± 4.4 years vs 26.6 ± 4.5 years, $P < .001$). A review of patients' clinical histories revealed two differences between patients receiving care from obstetricians and those cared for by family physicians (Table 2). Patients obtain-

Table 2. Clinical Composition of Patient Populations in the Obstetrician Group and Family Practice Group

Variable	Obstetrician Group (n=2865) n(%)	Family Practice Group (n=2000) n(%)	P Value
Previous cesarean section	295 (10.3)	93 (4.7)	<.001
Primiparous	1225 (42.8)	754 (37.7)	<.001
Labor induced	299 (10.4)	171 (8.6)	.03
Labor augmented	510 (17.8)	297 (14.9)	.006
Epidural anesthesia used in labor	485 (17.0)	108 (5.4)	<.001
Amniotomy	1708 (59.6)	1138 (56.9)	>.05

ing care from obstetricians were: (1) more likely to have had a previous cesarean section delivery; and (2) more likely to be primiparous. Management of labor also differed between the specialties: induction of labor, use of oxytocin for augmentation, and use of epidural anesthesia during labor were more common in the obstetrician patient population.

Examination of labor outcomes showed that patients managed by obstetricians were more likely to have an episiotomy during vaginal delivery (74.5% vs 53.7%, $P<.001$) and more likely to have cesarean section deliveries (16.0% vs 9.3%, $P<.001$). Amniotomy was also more common in the group of patients managed by obstetricians, but this small difference was unlikely to be clinically significant and did not reach statistical significance (59.6% vs 56.9%, $P>.05$).

When analyzed by individual site, the cesarean section rate for patients cared for by obstetricians was significantly higher, ranging from 1.8 to 6 times that of patients managed by family physicians. Patients managed by family physicians were noted on average to have reached a greater cervical dilatation than the obstetrician patient population when the decision was made to perform a cesarean section. To understand the difference in frequency of cesarean section delivery between the physician groups, we examined the diagnosis justifying the cesarean section. Obstetricians diagnosed cephalopelvic disproportion or dystocia almost twice as often as family physicians (9% vs 5%, $P=.04$). Compared with family physicians, obstetricians were no more likely to perform a cesarean section for malposition ($P>.05$), fetal distress ($P>.05$), or for all other reasons ($P>.05$).

Because the patient populations of family physicians and obstetricians differed in terms of their parity, history of previous cesarean section, and use of intrapartum epidural anesthesia, backward stepwise logistic regression

Table 3. Neonatal Outcomes in Low-Risk Pregnancies Managed by Obstetricians and by Family Physicians

Variable	Obstetrician Group (n=2865)	Family Practice Group (n=2000)	P Value
Mean birthweight, g \pm SD	3519 \pm 476	3532 \pm 445	NS
1-minute Apgar score <6, n(%)	169 (5.9)	114 (5.7)	NS
ICU needed, n(%)	97 (3.4)	76 (3.8)	NS
Birth trauma, n(%)	155 (5.4)	100 (5.0)	NS
Neonatal infection, n(%)	46 (1.6)	34 (1.7)	NS

SD denotes standard deviation; NS, not significant; ICU, intensive care unit.

was performed to adjust episiotomy and cesarean rates for these variables. Since no difference was found in the mean birthweight for infants delivered by family physicians and obstetricians (Table 3), birthweight was not included in the regression model. Results showed that after adjustment for the effects of parity, epidural anesthesia use, and insurance status, patients of obstetricians still had a higher episiotomy rate than those of family physicians (adjusted OR=1.64, 95% CI 1.42 to 1.89, $P<.001$). After adjusting for previous cesarean section, epidural anesthesia use, insurance status, and parity, analysis of cesarean section rates showed that a significant relationship between obstetricians and cesarean section delivery persisted even after adjusting for potential confounders (adjusted OR 1.48, 95% CI 1.22 to 1.81, $P<.001$). Statistically significant relationships were also found on the logistic regression model for cesarean section and primiparity (adjusted OR=3.72, 95% CI 3.00 to 4.63), previous cesarean section (adjusted OR 8.90, 95% CI 6.72 to 11.78) and epidural analgesia use in labor (adjusted OR 3.16, 95% CI 2.56 to 3.91).

Finally, to control for the potential effects of referral bias, cesarean section frequency was reexamined based on the specialty of the physician who initially provided prenatal care. Overall, the cesarean section delivery rate for patients initially cared for by a family physician was 10% as compared with a 15% rate for patients starting their care with an obstetrician ($P<.01$). Significant differences between family physicians and obstetricians were found in four of the five sites.

In addition to examining maternal outcomes, we analyzed 1-minute Apgar scores and selected neonatal outcomes for infants delivered by family physicians and obstetricians. Birthweights were similar for infants delivered by obstetricians and family physicians (Table 3), and no differences were found between the obstetrician and family practice groups with respect to Apgar scores of less than 6 at 1 minute, birth trauma, neonatal infection, or

the need for neonatal intensive care (Table 3). There were only two neonatal deaths in the sample (both in the obstetrician group).

Discussion

This study suggests that maternity care for women who have low-risk pregnancies and whose infants are delivered by family physicians differs from that provided by obstetricians. At least for the five sites considered in this study, maternity care in obstetrics and family practice differed in three important aspects: (1) the demographics of the patient populations; (2) clinical features of the populations; and (3) outcomes achieved. In every site, obstetricians had a higher cesarean section rate than did family physicians. When adjusted for primiparity, previous cesarean section, and epidural anesthesia use, the increased odds associated with specialty were a significant factor for cesarean section delivery, even though these odds were less than those for the other clinical factors examined.

Previous studies have produced inconsistent findings regarding the relationship between specialty and use of selected interventions. Canadian studies by MacDonald and co-workers,²⁶ Rosenberg and Klein,¹⁰ and Klein and associates¹⁴ at a university hospital in England suggested that family physicians were less likely to induce labor or to use intrapartum epidural anesthesia. Analysis of other obstetrical interventions yielded conflicting results.

Comparisons of the cesarean section rates of family physicians and those of obstetricians have shown a non-statistically significant trend toward lower rates for family physicians. For example, MacDonald et al²⁶ found that family physicians had a cesarean section rate of 4.6% as compared with 7.9% for obstetricians; the study of Rosenberg and Klein¹⁰ showed rates of 9.9% and 11.1% for family physicians and obstetricians, respectively. In Britain, Klein and co-workers¹⁴ also found that emergency cesarean section rates for primiparous patients managed by general practitioners (4.4%) were lower than those for patients in a shared-care unit of obstetricians and general practitioners (5.1%). Although these studies cannot be considered statistically significant because of the small number of patients analyzed, their findings of lower cesarean section rates for family physicians are consistent with the results of our study.

One problem with many of the previously reported studies is that they included small numbers of patients (ranging from 81 in the study of Rosenberg and Klein¹⁰ to 702 in the study of MacDonald and colleagues²⁶), which increases the likelihood of a type II error. For example, both studies showed an increase in the percentage of women cared for by obstetricians who elected to

use epidural anesthesia in labor, but the results were not consistently statistically significant. In a previous study examining the process of care and outcomes in 2365 women in one Ontario hospital,¹¹ observed differences between family physicians and obstetricians were similar to those reported in this study; however, as in previous studies, differences in cesarean section rates between family physicians (6.8%) and obstetricians (7.7%) were not statistically significant.

Another factor influencing the results of previous reports is that all studies focused on maternity care at a single institution in a health care system that is different from that of the United States. Studies performed in single hospitals may be reporting anomalous findings peculiar to that particular institution. In this study, we used multiple settings in various areas of the country to reduce the likelihood of institutional or regional bias. Findings such as the higher cesarean section rate for obstetricians in all sites increase the external validity of our results. Furthermore, results of studies performed in countries without the predominant fee-for-service system and malpractice environment of the United States may have limited applicability in the United States. Except for smaller pilot studies¹⁵⁻¹⁷ limited to a single hospital, we believe this to be the only large multisite study to examine interspecialty differences in maternity care in the United States.

Variability in the management of similar conditions is not unique to maternity care. Wide variations in the use of surgical procedures, such as radical prostatectomy^{27,28} and hysterectomy,²⁹ and in the use of medical diagnostic procedures, such as esophagoduodenoscopy³⁰ and cardiac catheterization,^{31,32} have sparked debate about the indications for these interventions. Based on the large variation between sites and between specialties in the diagnosis of cephalopelvic disproportion and the use of such interventions as cesarean section delivery and episiotomy, further examination of the appropriate indications and use of these procedures is warranted.

Variation in resource utilization based on physician specialty has also been reported in the Medical Outcomes Study.¹ Overall, compared with other specialists, generalist physicians were found to care for patients with similar conditions more economically and with fewer interventions. The results of our study suggest that the Medical Outcome Study's findings that family physicians are less likely to use costly interventions during medical management of selected problems also apply to the management of maternity care.

These conclusions should be judged within the limitations of this study. First, the retrospective nature of this study did not allow us to examine several other issues that could have had an impact on the use of various procedures. Among these are patient expectations about vari-

ous procedures. Some data suggest that patients who seek prenatal care from obstetricians place greater emphasis on quality of care, whereas patients who seek care from family physicians are more concerned with cost of care.³³ It is unclear to what degree patient self-selection contributed to the interspecialty differences observed in this study.

Second, it is possible that outcome differences between family physicians and obstetricians in this study reflect differences between patient populations or the use of some other technology, such as continuous fetal monitoring, that were not included as a measure in this study. The Medical Outcomes Study suggests that patients who seek care from generalist physicians tend to be younger and to have less severe illnesses.³⁴ By excluding patients with high-risk problems, we sought to produce comparable patient populations for obstetricians and family physicians; but without prospective randomization of patients, it would be impossible to produce samples that were likely to be similar in all potential confounders.

Finally, although efforts were made to include a large sample of patients from various types of hospitals and different regions of the country, the study sample of physicians and patients may not be representative of care in all regions of the country. In particular, it would be interesting to examine delivery outcomes for family physicians who perform cesarean sections to determine if their rates are closer to those of the obstetricians or the family physicians in this study. Further investigation of regional effects on specialty practices also would be useful in determining the likely causes of intersite variation of results in this study.

We found associations between physician specialty and the use of episiotomy and cesarean section delivery and the diagnosis of cephalopelvic disproportion in women with low-risk pregnancies. The difference in cesarean section rates persisted after adjusting for potential confounders of primiparity, previous cesarean section delivery, and use of intrapartum epidural anesthesia. These results raise the possibility that there are differences between the type of labor and delivery care provided by family physicians and obstetricians to women with low-risk pregnancies, and that patients cared for by these two specialty groups have different outcomes.

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