
Obstetric Referral in Family Practice

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Background. This study examines referral patterns of family physicians who perform obstetrics to determine the effects of referral bias on family physician and obstetrician patient populations.

Methods. A retrospective review of deliveries from five medical centers over a 2-year period produced a sample of 2568 women who began their obstetric care with family physicians and 2648 whose labor was initially managed by family physicians. To determine which demographic and risk factors are associated with an increased likelihood of referral, those who were referred to obstetricians before the onset of labor (early referrals) and those who were referred during labor (late referrals) were identified and compared with patients who were not referred.

Results. Of the initial 2701 patients who entered care with family physicians, 167 were early referrals and 249 were late referrals. Early referrals were more likely to have had a prior cesarean section (32% vs 3% of those not referred, $P < .001$) or malpresentation (10% vs 4%, $P < .001$) than those who were not referred. Among patients referred during labor, previous cesarean section (10% vs 2%, $P < .001$) and preeclampsia (12% vs 6%, $P < .001$) were more common.

Conclusions. These data suggest that referral bias is not a major source of differences in patient populations cared for by family physicians and obstetricians.

Key words. Referral and consultation; obstetrics; prenatal care; family practice. (*J Fam Pract* 1994; 38:368-372)

Obstetric practices of family physicians and the populations they serve are influenced by several factors. These include the type of patients who select family physicians as their caregivers (self-selection bias)¹ as well as referral practices of family physicians. Referral bias affects studies which examine maternity care based on the specialty of the physician who is recorded as performing the delivery.²⁻⁶ These studies ignore the potential for skewing of the result by referral of high-risk individuals from family physicians to obstetricians. As noted in a previous study,⁷ referral and consultation are complex issues with great potential to influence medical care and outcomes.

This study examines the issue of obstetric referral by family physicians by reviewing the care of 2638 women who gave birth at five hospitals during 1990 and 1991. Our intent was to determine how often maternity pa-

tients are referred by family physicians to obstetricians after prenatal care has been established with a family physician. We also examined what factors influenced referrals before the onset of labor (early referral) and during labor (late referral). Identification of these factors may be helpful in estimating the potential confounding effect of obstetric referral in analyses of obstetric populations served by family physicians and obstetricians.

Methods

Sample Selection

The study was performed as part of a larger examination of obstetric health services by a collaborative group in five states. One hospital in each state served as the data collection site. These sites included urban hospitals in South Dakota and Michigan, a county-managed university hospital in North Carolina, a suburban hospital in New York, and a rural hospital in Kentucky. Both family physicians and obstetricians admitted obstetric patients

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to the participating hospitals. All five hospitals also supported family practice resident training in obstetrics; two of the hospitals had full-time obstetric residents in house, and one had obstetric residents in house for portions of the 2-year period.

At each of these hospitals, a sample of up to 80 deliveries during each month between January 1990 and December 1991 was randomly chosen using a computer-generated random number table. If fewer than 80 women gave birth during a particular month, all women were included. Multiple births were treated as one delivery. To limit the analysis to women whose prenatal and intrapartum care was managed by the physician population under study, women who received no prenatal care or who were already in labor and were transferred to the hospital from another facility were excluded. Missing data were recorded as such and excluded from the analysis.

Detailed retrospective reviews were conducted by trained chart abstracters on all deliveries selected for study. This included reviewing the management of labor and delivery as well as examining prenatal records. Prenatal and hospital records were matched for all patients in the study. Determination of early referral was made for patients whose prenatal care began with a family physician but who were transferred to an obstetrician before the onset of labor. Early or late referral status was determined by scrutiny of the prenatal records. Early referral was assumed to have occurred for patients whose records indicated that prenatal care started elsewhere, if two sets of records were filed from different physicians, or if initial prenatal laboratory work was performed at a family physician's office and sent to an obstetrician's for the prenatal records. Late referral was determined by matching the admitting physician's name with that of the physician performing the delivery.

Demographic information, presence or absence of 45 specific risk conditions, which were taken from the Hollister scoring system (Hollister, Inc, Libertyville, Ill) and used by all practices in this study, and information regarding the management of labor and delivery were noted for each patient. Because this study focused on the most common causes of referral, analysis was performed only on risk factors present in at least 5% of the referral group. Because of the rarity of medical risk factors, the specific risk conditions of cardiac disease, asthma, seizure disorder, and thyroid disease were combined into one single risk factor called "medical problems."

A review of 8647 records revealed that 6079 patients obtained their entire prenatal and intrapartum care from obstetricians. The remaining 2568 women initiated their care with 178 family physicians. At the start of labor, 2648 women were under the care of family phy-

Table 1. Characteristics of Patients in Early Obstetric Referral Group vs Nonreferral Group

	Early Referral Group (n = 167)	Nonreferral Group (n = 2401)	P Value
Demographics			
Age, y (\pm SD)	26.0 (5.5)	25.5 (5.4)	NS
White, %	87	89	NS
Insured, %	44	54	.007
Parity (\pm SD)	1.1 (1.2)	1.1 (1.9)	NS
Risk factors			
Uterine scar, %	32	3	<.001
Smoking, %	13	13	NS
Medical problems*, %	5	6	NS
Obstetric problems			
Preeclampsia/PIH, %	6	6	NS
Preterm labor, %	4	4	NS
Malpresentation, %	10	4	<.001

*Includes cardiac problems, asthma, seizure disorder, thyroid disease. SD denotes standard deviation; NS, not significant; PIH, pregnancy-induced hypertension.

sicians. Because of cross-coverage arrangement between two groups of family physicians and midwives and patients who were admitted without prior prenatal care, the number of patients cared for in labor exceeded the number whose prenatal care began with family physicians. This report is based on data from these two patient groups.

Statistical analyses were performed using EpiInfo 5.⁸ Continuous data were compared using Student's *t* test, and discrete variables were compared using chi-square tests. Statistical significance was set at $P = .05$.

Results

Of the 2568 women whose care began with family physicians, 167 (6.5%) women were referred to obstetricians before they were admitted in labor (early referrals). This rate was lower in the population of women whose care started with practicing family physicians (5.7%) as compared with women whose care started with family practice residents (8.5%) ($P = .008$).

Patients who were referred before labor were more likely to lack private insurance but otherwise were similar in age, race, and parity to patients who were not referred. When risk factors and obstetric problems were reviewed, only six conditions were seen in 5% or more of the referral population. Of these, only a previous cesarean section and current malpresentation were associated with referral to an obstetrician (Table 1). Uterine scar (or previous cesarean section) was present in 32% of all women who were referred early, compared with only 3% of those who were not referred ($P < .001$). Malpresen-

Table 2. Characteristics of Patients in Late Obstetric Referral Group vs Nonreferral Group

	Late Referral Group (n = 249)	Nonreferral Group (n = 2399)	P Value
Demographics			
Age, (\pm SD)	25.7 (6.0)	25.3 (5.4)	NS
White, %	89	90	NS
Insured, %	51	50	NS
Parity (\pm SD)	1.1 (1.2)	0.7 (1.2)	<.001
Risk factors			
Uterine scar, %	10	2	<.001
Smoking, %	11	18	.007
Medical problems*, %	4	3	NS
Obstetric problems			
Preeclampsia/PIH, %	12	6	<.001
Preterm labor†, %	7	5	NS
Premature rupture of membranes, %	7	4	.09

*Includes cardiac problems, asthma, seizure disorder, thyroid disease.

†Without rupture of membranes.

NS denotes not significant; PIH, pregnancy-induced hypertension.

tation was seen in 10% of women referred early, compared with 4% of those not referred ($P < .001$). Maternal smoking, maternal medical problems, preeclampsia or pregnancy-induced hypertension, and preterm labor were not associated with an increased incidence of early referral.

Because of cross-coverage arrangements between a group of nurse midwives and family physicians, the initial number of women managed in labor by family physicians exceeded the number who received prenatal care. Of the 2648 women whose labor and delivery were initially managed by family physicians, 249 (9.4%) were transferred to obstetricians during labor (late referrals). There was no significant difference in the referral rate for family practice residents (9%) and practicing family physicians (9.6%) ($P = .62$).

Patients who were transferred in labor were of higher parity than those not referred (1.1 vs 0.7, $P < .001$), as well as having a higher rate of previous cesarean section (10% vs 2%, $P < .001$) and preeclampsia (12% vs 6%, $P < .001$) (Table 2). Patients transferred during labor were less likely to be cigarette smokers than those not transferred ($P = .007$). There were no statistically significant differences in the frequency of medical problems, preterm labor, or premature rupture of membranes between the two groups. No other risk conditions were present in 5% of the women who were referred.

When labor outcomes were analyzed, it was found that there was a strong association between both early and late referral and delivery by cesarean section (Table 3). Early referral increased the risk of cesarean section by

a factor of 6, whereas late referral increased the rate of cesarean section over 40 times.

Discussion

This study showed that early referral of patients from family physicians to obstetricians was fairly uncommon and accounted for only about 6% of all patients who started obstetric care with family physicians. This rate was slightly higher for residents, which could be secondary to greater confidence among experienced practitioners or could simply reflect the unique characteristics of populations served by physicians-in-training.

A large proportion of the patients referred before labor appeared to be referred because of a previous cesarean section or current malpresentation. Since only a few family physicians in this study performed cesarean sections, it is possible that these patients were referred for either elective repeat cesarean sections or cesarean sections for malpresentation.

Finally, there also appeared to be a small effect of payment on early referral. This effect could be related to socioeconomic influences on election for repeat cesarean section, or could indicate that family physicians are less likely to refer patients with better payment mechanisms. Additional exploration of this issue is needed to clarify the effect of payment systems on referral patterns.

Except for the lack of an effect of insurance status on referral, late referrals followed a pattern similar to that of early referrals. In most cases, it appears that referrals were made for cesarean delivery. This suggests that family physicians refer patients who are in labor not because of a high-risk obstetric condition, but rather because of the need for a technical skill within the expertise of an obstetrician, namely, cesarean section. One exception to this trend is the increased rate of preeclampsia observed among patients referred to obstetricians. This is the only clinical condition that appears to be associated with an increase in family physician-to-obstetrician referrals.

Table 3. Outcomes for All Referred Patients vs Nonreferred Patients

	Referral Group	Nonreferred	P Value
Early referrals			
	(n = 167)	(n = 2401)	
Vaginal delivery, %	46	91	<.001
Cesarean section, %	54	9	
Late referrals			
	(n = 249)	(n = 2399)	
Vaginal delivery, %	19	98	<.001
Cesarean section, %	81	2	

These data suggest that approximately 15% of patients whose deliveries are performed by obstetricians were initially cared for by family physicians. The referral patterns observed in these patients suggest that for risk factors other than previous cesarean delivery, the referral process should not skew the distribution of conditions for family physicians when compared with those for obstetricians. Nevertheless, because this referral process will have an effect on comparative cesarean section rates between the two specialties, referral should be controlled for whenever this issue is examined. For conditions other than cesarean section, outcomes should not be adversely affected by referral bias.

However, previous reports suggesting that maternal populations served by family physicians are more likely to be poorly insured or from lower socioeconomic classes^{2,3} could be biased by the selective referral of patients for cesarean section. Previous studies have noted a socioeconomic bias among patients who receive cesarean sections. Cesarean sections are more common among insured patients^{9,10} and those who obtain their care from private sources rather than public or teaching clinics.^{11,12} There may also be a socioeconomic bias in the provision of regional anesthesia during labor,¹³ which could result in increased rates of cesarean section in more affluent populations.¹⁴ If patients of a higher socioeconomic status are referred by family physicians for cesarean section, it may appear that a larger population of the economically underserved are present in the obstetric practices of family physicians.

One caveat to these conclusions is that the observed socioeconomic biases in the use of cesarean sections have not been reported for maternity care rendered by family physicians. Biases in cesarean section have been reported only in series of patients who obtain their care from obstetricians. Since cesarean section frequency differs for patients of obstetricians and family physicians,^{15,16} it is quite possible that the socioeconomic factors that appear to influence cesarean section rates for obstetricians are less important when labor is managed by family physicians. Further research is needed to clarify the influence of these variables on obstetric care delivered by family physicians.

A second limitation of this study is its retrospective nature, which limited the ability of the investigators to determine the precise reason for the referral or to precisely record the timing of the referral. Additionally, it could not be determined if the severity of selected high-risk conditions, such as preeclampsia, differed among referred as opposed to nonreferred patients. Although we attempted to capture every early referral that occurred, poor documentation in prenatal records may have caused us to miss some cases.

With these limitations in mind, it appears that family physicians refer patients to obstetricians primarily for cesarean section. Of the high-risk conditions examined, only preeclampsia was associated with an increase in the use of referral either before labor or during labor. These results suggest that there is little referral bias in the risk status of the obstetric populations of family physicians and obstetricians provided the incidence of preeclampsia is not high in the population studied. Whereas this referral pattern is unlikely to have a major effect on obstetric outcomes studies, the trend observed in this study could result in skewed socioeconomic profiles of obstetric patients for family physicians and obstetricians.

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