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# The Quality of Obstetric Care in Family Practice: Are Family Physicians as Safe as Obstetricians?

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*A literature review on the quality of obstetric care in family practice was conducted to determine whether family physicians are as competent in providing obstetric care as obstetricians. Three types of studies were reviewed: case series, historical cohorts, and population-based studies. No conclusion on the quality of obstetric care in family practice can be drawn from the available studies because of research design limitations. Available evidence suggests, however, that family physicians are as safe as obstetricians when delivering babies, particularly when they concentrate their efforts on providing personal prenatal care, refer high-risk pregnant women appropriately, and practice less technologically oriented care on women who deliver normal-weight babies. In addition, no evidence emerged that family physicians provided significantly poorer obstetric care than obstetricians. In fact, the results from population-based studies suggest that family physicians may be safer than obstetricians in delivering normal-weight infants because of their hypothesized less use of technological interventions in that low-risk group of patients. Further studies, especially prospective randomized trials in which the outcomes are assessed in a blinded fashion and case mix is rigorously controlled, are needed to provide a definitive answer. As practical, ethical, and economic constraints are likely to preclude such studies, the case-control design may provide a reasonable alternative.*

Few topics in medicine engender as much emotional debate as what type of health care provider is qualified to deliver babies. After the creation of the specialty of family practice in 1969, family physicians entered this debate in force, publishing numerous articles to encourage their fellow family physicians to provide obstetric care. The authors of these articles cited philosophical, financial, and provider satisfaction reasons, and urged family physicians to practice obstetrics despite its increasingly technical nature and the time demands it places on a busy practitioner.<sup>1-7</sup> On the other hand, some obstetricians,

who view all deliveries as potentially high risk and family physicians as not sufficiently qualified, have continued to discourage family physicians from practicing even low-risk obstetrics.<sup>8,9</sup> In addition, the rising obstetric malpractice insurance rates have served to discourage family physicians from practicing obstetrics.<sup>10</sup> Responding to these forces, family physicians have sought to demonstrate that they provide high-quality obstetric care.<sup>11</sup> This article seeks to review those efforts and propose areas for future study.

Quality of care determinants can be divided into structure, process, and outcome variables. As defined by Donabedian,<sup>12</sup> structural variables are "those relatively stable characteristics of the providers of care, of the tools and resources they have at their disposal, and of the physical and organizational settings in which they work." Process variables are "the set of activities that go on within and between practitioners and patients." Outcome variables are "changes in a patient's current and future health status that can be attributed to antecedent health care." For the

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TABLE 1. FAMILY PRACTICE AND GENERAL PRACTICE CASE SERIES RESULTS

First Author	Country	Years	Deliveries	Referral Rate (Antepartum and Intrapartum)	Perinatal Mortality Rate (Deaths/ 1,000 Live Births)
Koning <sup>15</sup>	United States	1961-1981	1,380	—	5.7
Marsh <sup>16</sup>	United Kingdom	1962-1976	701	29.1	8.5
Owen <sup>17</sup>	United Kingdom	1970-1979	10,588	—	6.9
				(8.4% transferred in labor)	
Oldershaw <sup>18</sup>	United Kingdom	1965-1975	1,700	15.0	10.0
Bull <sup>19</sup>	United Kingdom	1968-1977	7,562	31.9	12.2
				(8.3% transferred in labor)	
Richmond <sup>20</sup>	United Kingdom	1972	3,199	40.0	15.9
				(14% transferred in labor)	
Wood <sup>21</sup>	United Kingdom	1946-1970	818	20.0	22.5

purposes of this review, one structural variable, that is, whether the physician delivering the baby is a family physician or an obstetrician, will be examined and then compared with the process and outcome characteristics of care delivered by those two types of physicians. Process and outcome variables that relate to the issue of "safety" in obstetric care,<sup>13</sup> such as perinatal mortality rate, will be examined in this article, while other outcomes, such as maternal satisfaction or costs, will not be reviewed.

It is important to establish criteria for assessing articles on the quality of obstetric care. General criteria have been suggested by epidemiologists and biostatisticians at McMaster University.<sup>14</sup> The best study to investigate the issue of the quality of obstetric care in family practice would be a prospective cohort study in which patients were randomly assigned to a family physician or an obstetrician. Relevant process and outcome characteristics in both the prenatal and perinatal period would then be measured in a blinded fashion. Controlling for disease severity (case mix), the accuracy and utility of diagnostic tests, the efficacy and toxicity of treatments, and patient compliance would also be important, as these factors are also related to outcome. Significantly, no such rigorously controlled prospective studies have been published.

The available studies published since 1969 fall into three main categories: longitudinal case series from family physicians or general practitioners, historical cohort studies comparing family physician care with obstetrician care, and population-based studies comparing areas or hospitals where the majority of physicians delivering babies are family physicians with areas where the majority of physicians are obstetricians.

## CASE SERIES

Many series of patients receiving their obstetric care from family physicians and general practitioners have been re-

ported in the United States and the United Kingdom over the past ten years (Table 1). Four series were from individual practices, while three were from group practices. Perinatal mortality rates vary from a low of 5.7 deaths for every 1,000 live births, as reported by Koning<sup>15</sup> in his individual series, to a high of 22.5 deaths for every 1,000 live births, as reported by Wood<sup>21</sup> in his individual series. Wood attributed his higher rate to the fact that his practice included home deliveries and occurred during a time when obstetric technology had not matured to its current level, and at least in the early years of his practice, quick access to a backup obstetrician was not likely.

All the authors attributed these relatively low perinatal mortality rates to their early identification and referral of high-risk pregnant women to obstetricians for further management of pregnancy. The statistics do not support such an observation, however, as the second and third highest perinatal mortality rates occurred in the two studies where the general practice groups had the highest referral rate.

In addition, many authors attributed their findings to their style of care—emphasis on prenatal care with greater personal attention and fewer technological interventions. No study has adequately defined or measured such variables, however.

It is difficult to draw conclusions about the quality of family practice obstetric care from these case series because appropriate comparison groups (ie, care given by obstetricians during the same period) were not assembled in any of the studies. Although national norms are not a truly appropriate standard of comparison, family physicians did have lower overall perinatal mortality rates than the national averages in the United States and United Kingdom at the time (Table 2).

The claim was made in several of the case series that more personal prenatal care decreased the perinatal mortality rate. While the exact definition of such care was not clarified, the point is supported by one study in the United States that examined the continuity of prenatal care.<sup>22</sup>



TABLE 2. INFANT MORTALITY RATES\*

Year	United States	United Kingdom
1960	25.6	22.5
1970	19.8	18.4
1980	12.5	12.1

\* Per 1,000 live births. From the demographic yearbooks of 1961, 1971, and 1981, United Nations Publishing Service, New York, NY, 1961, 1971, 1981.

That study noted that babies born to women cared for in a family practice center, where provider continuity was higher, weighed 220 g more than babies born to women cared for in an obstetric clinic, where continuity was lower.

Case mix (the specific mixture of disease severity and risk status in a group of patients) varies considerably in these case series. This variability in case mix interferes with the ability to draw conclusions from these studies on the link between physician specialty and obstetric outcome. For example, were the lower than the national average perinatal mortality rates recorded in these series the result of better quality family practice obstetric care, or were they due to family physicians caring for a lower risk group of patients? Without a comparison group at similar risk status cared for by obstetricians, it is impossible to answer this question with any degree of satisfaction.

## HISTORICAL COHORTS

There are a number of studies in the literature in which care provided by family physicians is compared with that provided by obstetricians during the same period. All of these studies are retrospective in nature, with process and outcome measures determined by chart review. All sought to link delivery process with outcome, but only two of the studies considered prenatal care process variables to even a minor degree. The studies occurred in various settings without rigorous control for case mix. The results from the five available studies<sup>23-27</sup> are summarized in Table 3, with the authors' conclusions listed in the last column.

From these studies, it appears that family physicians generally cared for women of similar risk, although in the two studies conducted by Phillips et al<sup>24</sup> and by Wanderer and Suyehira,<sup>25</sup> it was concluded that family physicians cared for women at higher risk than their obstetrician counterparts. Little information on prenatal care was reported by these studies, and thus no conclusions could be made about the quality of prenatal care.

In general, when looking at the labor and delivery process, family physicians had a higher percentage of patients who used no analgesia. Likewise, family physicians used less conduction anesthesia, with the percentage of family practice patients that used conduction anesthesia varying from 4.5 percent in multiparous women in the United

Kingdom to 52 percent in an inner-city hospital in the United States. Family physicians induced labor less often, and certain stages of labor were longer depending on whether the women were multiparous or primiparous. During delivery, family physicians used low forceps less often, but patients sustained more perineal tears. In two of the studies in which this result occurred, tearing was thought to be due to inexperience, as family practice residents constituted the family practice group being compared with practicing obstetricians.

No differences were detected in maternal postpartum outcomes, except in the study by Ely et al<sup>23</sup> in which the higher rate of maternal complications was thought to be because of a much higher rate of premature rupture of membranes in the family practice patients (a known risk factor for postpartum endometritis<sup>13</sup>). Likewise, no differences were detected in infant outcomes, except in the study by Klein et al<sup>27</sup> in which the slightly better infant outcome in the general practice patients was thought to be because of less technological intervention on the part of the general practitioner.

Even though wide variation in the style of family practice obstetric care is evident in these historical cohorts, generally family physicians used fewer technological interventions in the delivery process (ie, less conduction anesthesia, less induction of labor, less use of elective low forceps) than obstetricians without significantly decreasing the quality of care as measured by maternal and infant outcomes. This result was apparent even in the two studies where family physicians took care of higher risk women.

Caution must be exercised in accepting these conclusions, however. First, all these studies examined relatively small numbers of patients. Thus, differences between groups in infrequent adverse outcomes, such as maternal or infant deaths, might not reach statistical significance because of the low statistical power of these studies. Second, case mix varied widely and was not rigorously controlled. Third, process and outcome characteristics were not assessed in a blinded, objective fashion. This last point is particularly important, given the suggestion that obstetricians are less likely than family physicians to report birth injuries and malformations.<sup>28</sup> Assessments of degree of perineal lacerations, estimated maternal blood loss, infant Apgar scores, and other important outcomes are also subjective and may differ between family physicians and obstetricians, further confounding comparisons.

## POPULATION-BASED STUDIES

Rosenblatt et al<sup>29</sup> examined the impact of a national perinatal regionalization program in New Zealand on perinatal mortality from 206,054 births during 1978 to 1981. He found that level 1 hospitals (small rural hospitals staffed by general practitioners and midwives) have lower birthweight-specific perinatal mortality rates in all but the lowest birthweight category than level 2 or 3 hospitals



TABLE 3. QUALITY OF FAMILY PHYSICIAN OBSTETRIC CARE IN FIVE RETROSPECTIVE COHORT STUDIES\*

First Author	Setting	Physicians	Number	Analgesia	Anesthesia	Labor	Length of Labor	Delivery	Postpartum Outcome	Infant Outcome
Ely <sup>23</sup> (1976)	University	Family practice department vs obstetric department	111/1,197	More used no analgesia (18 vs 10)	Less conduction (16.9 vs 62.8)	Less augmentation (10.7 vs 19.8)	Longer stage 1 in primipara (12.2 vs 9.2 hr)	Less elective low forceps (15.3 vs 28.2)	More total complications due to more endometritis	No difference
Phillips <sup>24</sup> (1975)	Inner city	Family practice residents vs obstetric residents	50/50	More used no analgesia (26 vs 16)	Less conduction (52 vs 88)	Fewer inductions (6 vs 28)	No difference	More 4th degree lacerations (18 vs 2)	No difference	No difference
Wanderer <sup>25</sup> (1980)	Urban health maintenance organization	Family practice residents vs obstetric residents	199/193	More patients received narcotics (29.6 vs 17.1)	Less conduction (12 vs 25.9)	More augmentation (46.8 vs 26.2)	Longer stage 2 in multipara (28.1 vs 21.2 min)	More 3rd degree lacerations (13 vs 3)	No difference	No difference
Meyer <sup>26</sup> (1981)	Rural	Family physicians vs obstetricians	50/50	More used no analgesia (60 vs 28)	No difference	No difference	Longer stage 3 in primipara (8.2 vs 56 min)	More 2nd degree lacerations (10 vs 0)	Shorter hospital stays	No difference
Klein <sup>27</sup> (1983)	United Kingdom	General practitioners vs obstetricians	248/1,188	More used no analgesia (36 vs 11)	Less conduction P (28.6 vs 36.8)** M (4.5 vs 16.6)***	Fewer inductions P (15.4 vs 22.5) M (9.6 vs 26.6)	No difference	Less elective low forceps P (27.5 vs 36.4) M (4.5 vs 16.6)	—	Fewer intubations in infants delivered by multipara (0.0 vs 0.3). Fewer admissions to NICU† (0.0 vs 0.8)
Reviewer's conclusion				Less use of analgesia	Less conduction	Fewer inductions	Longer labors	Less elective low forceps More tears	No difference	No difference

\* Numbers in parentheses are percentages unless otherwise noted, the first number being the percentage of family practice deliveries with that variable

\*\* P, primipara

\*\*\* M, multipara

† NICU, neonatal intensive care unit



(referral hospitals in which the majority of deliveries are done by obstetricians). Rosenblatt and colleagues offered two explanations for their results: (1) the national screening protocol used by general practitioners is extremely sensitive in detecting those babies who will die in the first week of life and be referred to level 2 or 3 facilities before birth, and (2) there is an advantage, especially for normal birthweight infants, to being born in smaller, less-sophisticated hospitals. Rosenblatt et al assigned perinatal deaths to the hospital in which the birth occurred, so that these results cannot be accounted for by transfer of "sick" babies after birth from level 1 to level 2 or 3 hospitals, where the infant later died. Also the method of using birthweight-specific perinatal mortality rates employed by Rosenblatt et al effectively controls for many of the case-mix confounders not controlled for in previously reviewed studies. Thus, these results support the contention that delivery by family physicians does not constitute a risk factor per se, especially in normal birthweight babies, and might indeed be an advantage. Hein,<sup>30,31</sup> reporting on studies conducted in Iowa, cited similar results.

Two reports from the United Kingdom studying perinatal mortality rates in areas served by general practitioners vs those served by general practitioners and obstetricians showed no difference in perinatal mortality in infants weighing more than 2,500 g.<sup>32,33</sup> In infants weighing less than 2,500 g, one study<sup>33</sup> did show a slightly lower perinatal mortality rate in areas served by obstetricians.

Further support for the conclusions of Rosenblatt et al comes from a study of the safety of obstetric care in northern Ontario by Black and Fyfe.<sup>34</sup> To avoid the problem of referral bias, Black and Fyfe assigned outcomes to specific communities, rather than hospitals, and then determined the level of obstetric service for each community. In level 1A through 1C communities, care was provided by general or family physicians only. In level 1D communities at least one obstetrician or pediatrician was present in the community, but fewer than 1,000 deliveries occurred each year. In level 2 communities two or more obstetricians and pediatricians were present, more than 1,000 deliveries occurred each year, and referrals from level 1 communities were accepted. No statistically significant difference in perinatal mortality rate occurred among the various levels of obstetric service. A statistically significant difference did occur in the number of instrumental and cesarean section deliveries combined when comparing areas served by obstetricians, 31.5 percent, with areas served by general and family physicians, 21.3 percent. As Black and Fyfe could not find any evidence that the two populations were significantly different in obstetric risk factors, they speculated that the perinatal mortality rate was not significantly lower in communities with better access to obstetricians because the higher number of instrumental and cesarean section deliveries negated the improvement in perinatal mortality rate that would result from better monitoring and intensive care.

No evidence emerges in population-based studies that family physicians deliver obstetric care of lower quality

than their obstetrician counterparts. In fact, studies suggest that when family physicians screen and refer high-risk women early in pregnancy, their results are better than those of obstetricians in taking care of normal-weight babies. It may be, as Klein et al<sup>35</sup> suggest, "that the excellent intensive care accorded to the high risk women [by obstetricians] spilled over into the care of those women for whom pregnancy and labour was expected to be relatively trouble-free." Therefore, Klein et al add, because "no procedure no matter how well intended is free of risk, the same procedure which lowers risk when applied to a high risk woman may in fact increase risk, when applied to women at low risk." This notion is also supported in a recent review of technological interventions in obstetric care by Brody and Thompson.<sup>36</sup>

Several questions arise, however. First, most of these studies examined family physicians or obstetricians in areas or hospitals in which one group predominated rather than as a pure group. Thus, nonhomogeneity of the groups is likely. Second, process factors were not formally measured in any of these studies. Thus, the clinically important link between the process or care and the outcome of care cannot be made with certainty, and the process factors that resulted in the above outcomes are a matter of speculation. Third, it has been suggested by Hein and Brown<sup>37</sup> that the overall perinatal mortality rate does not give an accurate picture of obstetric quality of care in the various levels of hospitals because certain "nonsalvageable" infant deaths (infants weighing under 750 g and infants with congenital malformations) are included and may elevate the perinatal death rate in level 3 hospitals (as a result of the higher risk nature of their patients) out of proportion to the rate in level 2 and level 1 hospitals.

## DISCUSSION

Unfortunately, no published study meets the criteria for the ideal investigation capable of answering with high probability the question posed in the introduction to this article. Failure to include an adequate comparison group, failure to control for case mix, and failure to control for biases by assessing outcome in a blinded fashion are three criticisms that can be leveled against most, if not all, published studies. Furthermore, the clinically important link between the process of care, particularly the prenatal process of care, and obstetric outcome, although commented upon in all studies, is never really objectively assessed in any of them.

A large prospective randomized study on this issue is not likely to be undertaken because of economic, ethical, and practical constraints. A less costly way to gain additional evidence may be provided by the case-control study design. The case-control design has recently been used and advocated as a method for examining quality of care when adverse outcomes are rare.<sup>38</sup> Such a study calls for choosing a target adverse outcome, for example, infant



aspiration pneumonia, and then examining the relevant process of care. The group is then divided into those in whom the process was adequate (to continue the example, looking for the process of intubation and suctioning of meconium from the infant if meconium-stained amniotic fluid was present at delivery) vs those in whom it was not. This judgment would be based on criteria that are pre-selected as those components of care proven or believed to influence the target outcome as determined from a literature review and from experts in the field. Mothers could then be further divided by type of provider. An odds ratio that would give the risk of an inadequate process of care associated with care by a family physician could then be computed.

An additional advantage to be gained in doing case-control studies would be that the link between the process of care, particularly the prenatal process of care, which has not been well studied, and the outcomes of care would be more explicit. Because this association is often not formally investigated in the reviewed studies, speculations abound on what process of care led to the reported outcome. Vague terms and phrases such as "more personal" prenatal care, more emphasis on the whole patient to include nutrition and biopsychosocial factors, and not using highly technical obstetric procedures on low-risk women have all been used to describe the family practice process of obstetric care that has led to the good maternal and infant outcomes described in the reviewed studies. Future studies need to define further what is meant by those terms to see whether they do indeed lead to better obstetric outcomes in the family practice setting.

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