

Clinical Application of a High-Risk Scoring System on a Family Practice Obstetric Service

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A previously described antepartum risk-scoring system was evaluated in 113 consecutive deliveries done by family physicians to determine whether a request for obstetric or pediatric assistance could be predicted. In the defined low-risk group (score ≤ 3) assistance was requested in 12 of 72 patients. In the defined high-risk group (score > 3) assistance was requested in 23 of 41 patients. Out of 28 requests for obstetric assistance, 22 requests were for a specific skill (cesarean sections, difficult forceps, premature deliveries, shoulder dystocia, and retained placenta). All of the 27 requests for pediatric assistance were for acute resuscitation of the newborn. Reinforced in this study was the finding that a relatively small segment of patients (36 percent of the population) gave rise to most (67 percent) of the morbidity. Knowledge of this simple, reliable method to predict high-risk obstetric patients should help family physicians reduce maternal and infant morbidity.

The ability to predict a pregnancy with a poor outcome is important to family physicians. Antepartum scoring systems have been devised attempting to determine the high-risk group that has increased morbidity. Each system has been effective in achieving this goal. Unfortunately, many of

the scoring systems are cumbersome, making clinical application impractical.

In 1979, Edwards et al¹ described a simplified, antepartum risk-scoring system to assess the chance of neonatal morbidity and mortality. The system was easy to use and accurate in predicting the low-risk and high-risk populations among a group of university clinic patients and a group of prepaid health plan patients. This study uses the scoring system designed by Edwards et al to predict when a family physician will request obstetric or pediatric assistance during the labor and delivery process.

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NAME: _____ EDC _____	
RISK SCORE	RISK INDICATOR
Demographic	
2.....	Maternal Age: 15 years or under, 35 years or over
1.....	Parity: Nulliparous
2.....	Grand multipara
1.....	Race: Nonwhite
1.....	Marital: Out of wedlock
1.....	Economic: Dependent on public assistance
2.....	Prenatal care: After 27 weeks or fewer than 5 visits
Obstetric	
1.....	Infertility: Less than 2 years
2.....	More than 2 years
1.....	Previous abortion: One
2.....	Two or more
1.....	Premature or low birth weight infant: History of one
5.....	History of two or more
7.....	This pregnancy
1.....	Previous excessive size infant: One
2.....	Two or more
5.....	Previous perinatal loss: One
7.....	Two or more
7.....	Post term (beyond 42 weeks): This pregnancy
5.....	Previous cesarean section
1.....	Previous congenital anomaly
7.....	Incompetant cervix
5.....	Uterine anomaly
2.....	Contracted pelvis
1.....	Abnormal presentation: History of
7.....	This pregnancy
7.....	Rh negative sensitized
7.....	Hydramnios
1.....	Pre-eclampsia: Mild, history of
3.....	This pregnancy
2.....	Pre-eclampsia: Severe, history of
7.....	This pregnancy
1.....	Multiple pregnancy: History of
7.....	This pregnancy
Miscellaneous	
1.....	Nutrition: More than 20% overweight
5.....	Massive obesity
2.....	More than 10% underweight
3.....	Poor nutrition
5.....	Inadequate weight gain (< 12 lb)
3.....	Excessive weight gain (> 48 lb)
1.....	Smoking: More than 1 pack/day
1.....	Drug or alcohol abuse: History of
2.....	This pregnancy

Figure 1. Edwards' risk-scoring sheet. Reprinted with permission from The American College of Obstetricians and Gynecologists

Methods

One hundred thirteen consecutive, family practice obstetric patients were studied from Novem-

ber 1982 through April 1983. They were cared for by a group of 15 family physicians ranging from second-year residents to staff family physicians.

Medical	
1.....	Anemia: 8-10 g/dL
2.....	Under 8 g/dL
2.....	Sickle-cell trait
7.....	Sickle-cell disease
2.....	Hypertension: Mild
7.....	Severe
2.....	Heart disease: Class 1 or 2
5.....	Class 3 or 4
7.....	Heart failure: History of
7.....	This pregnancy
3.....	Diabetes: Gestational
7.....	Overt
1.....	Thyroid disease: History of
7.....	This pregnancy
1.....	Venereal disease: History of
5.....	This pregnancy
3.....	Cervical neoplasia
1.....	Urinary tract infection (afebrile): History of
3.....	This pregnancy
2.....	Urinary tract infection (febrile): History of
5.....	This pregnancy
1.....	Psychiatric and/or neurologic problem
5.....	Pulmonary disease: This pregnancy
1.....	Other significant medical problem

Figure 1, continued. Edwards' risk-scoring sheet. Reprinted with permission from the American College of Obstetricians and Gynecologists

Excluded from this study were patients of interns and of junior residents who had not completed four months of obstetric training. Also excluded from this study were five patients who, by department protocol, required mandatory obstetric consultation in the antepartum period (repeat cesarean sections). The patient population was composed of women of military families (mean age 20.3 years, mean parity 1.8). Each patient was followed by her assigned family physician through the prenatal course and through labor and delivery.

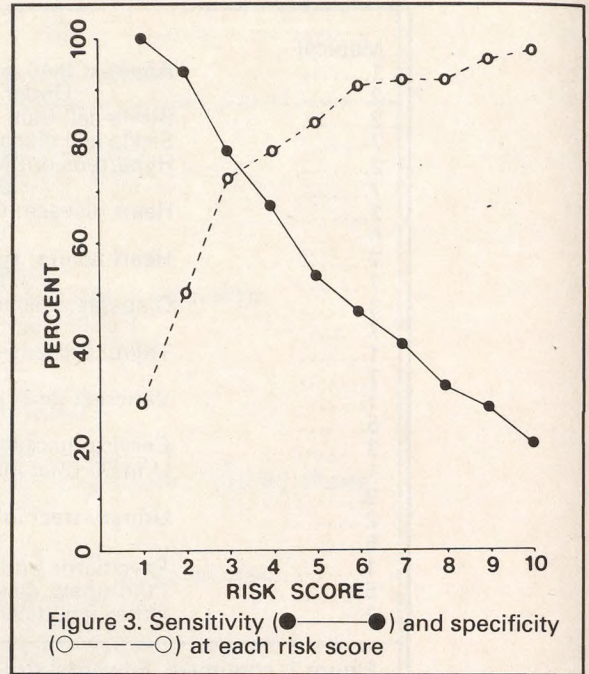
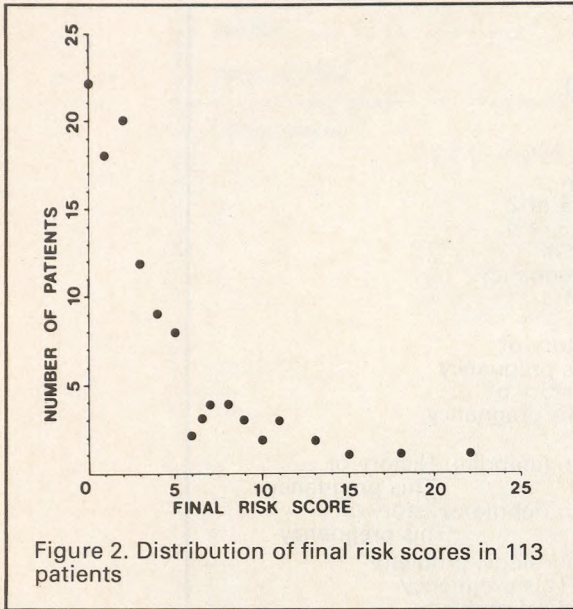
The study was done at Madigan Army Medical Center, a training hospital where the labor and delivery facility is shared with an obstetric teaching service and with pediatric house-staff support. During the labor and delivery process, the family physician assigned to that patient provided care for her. Obstetric and pediatric assistance was

given only if specifically requested. Mandatory consultation was required for cesarean sections and premature deliveries from both obstetric and pediatric departments.

The antepartum scoring system designed by Edwards et al was used in evaluating the 113 deliveries (Figure 1). The risk score was calculated at the first visit and on admission to the labor and delivery service. If a request was made for obstetric or pediatric assistance with the delivery, this request was recorded along with the reason for the request.

Results

In the study, 113 family practice patients were observed. The mean initial risk score (first visit)



was 2.5. The mean final score was 3.5 on admission to the labor and delivery service. The median final risk score was 2. Figure 2 shows the distribution of final risk scores. There were 72 patients with a score less than or equal to 3 (64 percent of the population), making up the low-risk group. Forty-one patients had a final score greater than 3 (36 percent of the population), defining the high-risk group.

Figure 3 presents a summary for each final risk score of the sensitivity and specificity in the request for consultation. The sensitivity is greatest at low-risk scores, and the specificity is greatest at high-risk scores. The point of intersection of the two curves represents the point of maximal benefit of sensitivity and specificity, and is used to distinguish low-risk from high-risk groups.

Thirty-five patients had complications leading to a request for assistance from an obstetrician or a pediatrician (Table 1). Twelve of these patients were in the low-risk group and 23 were in the

high-risk group. Note the high degree of overlap when a consultation was made. In 20 of 35 cases both obstetric and pediatric consultations were requested. The reasons for seeking consultation are described in Table 2.

Obstetric consultation was requested by the physician to either render an opinion in management as in fetal distress and pre-eclampsia, or to provide a specific skill during the delivery as in cesarean sections, premature deliveries, difficult forceps, shoulder dystocia, and retained placenta. When requesting pediatric consultation, all of the situations reflected an expectation for acute resuscitation of the newborn.

Discussion

Because of unforeseen events during the labor

	Total Number of Consultations Requested	Obstetrics Only Requested	Pediatrics Only Requested	Obstetrics And Pediatrics Requested
Low Risk	12	3	5	4
High Risk	23	5	2	16

*Group score ≤ 3
**Group score > 3

Reasons to Request Obstetric Consultation	
Cesarean sections (primary)	10
Fetal distress	5
Premature delivery	5
Difficult forceps	3
Shoulder dystocia (present)	3
Retained placenta	1
Severe pre-eclampsia	1
Total	28
Reasons to Request Pediatric Consultation	
Cesarean sections	10
Meconium	9
Premature delivery	5
Fetal distress	3
Total	27

process, a family physician may expect that there will be situations for which requesting assistance from an obstetrician or pediatrician is appropriate.

Knowing which patients will have a complicated delivery is crucial for family physicians who handle a large group of young families, especially for

those physicians who do not have immediate access to an obstetrician or pediatrician. With an understanding of the individual risks, a physician can make plans for adequate coverage, or for transfer of care to an appropriate facility. Sokol et al² have suggested that once a high-risk patient is identified, more energy can be devoted to her care with resultant decreased morbidity.

Methods used to identify a high-risk obstetrical patient have been well documented.²⁻⁶ Although there are some differences in technique, in each study the premise is the same: abnormal conditions tend to occur together and act synergistically, producing a cumulative effect on risk.³ The findings of the studies have been similar in that a relatively small number of patients have most of the morbidity. Nesbitt and Aubrey⁵ found 30 percent of the population experienced to 60 percent of the morbidity, and Sokol et al² found 25 percent of the population gave rise to 80 percent of the morbidity. The results of this study are similar to the other studies mentioned. The defined high-risk group (36 percent of the population) had 67 percent of the morbidity.

A unique difference of this study is the definition of morbidity. Other studies assessing obstetrical risk have looked at maternal or fetal complications.¹⁻⁷

This study defined morbidity as any reason for a family physician to request the presence of an obstetrician or pediatrician at the delivery. Clearly there are many factors that will contribute to such a request. Most important is the family physician's skill and experience. Some physicians are entirely capable and comfortable managing neonatal and obstetrical complications, or emergencies for which other family physicians require consultation and assistance. Other issues contributing to consultation include the patient population, the facility used, and the availability of specialist support.

The data indicate that obstetric support was requested at this institution either for a specific skill, or for an opinion on management of a potentially life-threatening complication. There were 22 requests for a specific skill (cesarean sections, premature deliveries, difficult forceps, shoulder dystocia, and retained placenta), and six requests for a management opinion (fetal distress and severe pre-eclampsia). All of the reasons for requesting a pediatrician involved an expectation for acute re-

suscitation of the newborn. Training programs should be directed to emphasize reliable acquisition of resuscitation skills.

There are several other observations from the data. The subset group scoring zero represented a significant portion of the population, and in none of these patients did the family physician seek consultation. Identifying a very low risk group may be helpful in establishing safe criteria for women desiring alternative birthing methods. The scoring system could be used as a teaching aid for residents to reinforce the contributing factors to a high-risk pregnancy.

The risk-scoring system described by Edwards and colleagues is an easy-to-use, reliable method available to screen obstetric patients. Implementation of this scoring system can be of help to family physicians in determining which patients will be likely to have complicated deliveries. This knowledge may help reduce the possibility of a poor outcome for mother and infant.

References

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