Referrals by Traditional Birth Attendants in Northeast Brazil

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Abstract: Between October 1980 and July 1981, 1,878 women were attended by traditional birth attendants (TBAs) at four obstetric units in rural areas surrounding the city of Fortaleza in Northeast Brazil. Of these women, 232 (12.4 per cent) were referred to a hospital in Fortaleza for delivery. The most important indicators for referral to hospital were: presence of an antenatal problem, complication of labor, or malpresentation. Based on record review, 65 referred women with none of these conditions were classified as low risk and 42 women not referred were classified as high risk (at least one such condition present). Of 1,878 deliveries, 32 (17 per 1,000) terminated as fetal deaths, and 12 infants died before discharge from hospital or obstetric unit (six per 1,000). The death rate was much higher for the high-risk cases (156 per 1,000 referrals, 95 for nonreferrals). Although some women may have been inappropriately referred while others who should have been were not referred, the system of referral has allowed TBAs to attend uncomplicated deliveries and to refer women with complications. (*Am J Public Health* 1985; 75:745–748.)

Introduction

Training programs for traditional birth attendants (TBAs) usually incorporate as one of their goals the identification of complicated cases for referral to a hospital. While there are reports and surveys describing the post-training performance of TBAs, these studies do not specifically address the referral process.[1] One concern expressed about TBA training programs is that over-referral will strain limited health facilities, because TBAs might refer not only high-risk patients but also patients requiring only routine care.

A pilot scheme to train TBAs was implemented in rural areas surrounding the city of Fortaleza in the Northeast region of Brazil in 1975. Selected TBAs were chosen to attend deliveries in small obstetric units provided by their communities instead of in the patients' homes. The largest obstetric units have 8–10 beds; the smallest have only one room attached to the home of the TBA. There are about 40 units in all. Each obstetric unit discussed in this paper is staffed by four TBAs; from 40 to 80 deliveries occur per month. The units have no operating rooms; only unassisted, spontaneous deliveries are performed there. An ambulance with driver is available at all times to transport women with delivery complications to a large maternity hospital in Fortaleza. Each TBA works an eight-hour shift, with three days on, one day off. Some may also do a few deliveries outside the units.

Five or six one-hour classes for TBAs are taught by specially trained physicians and nurses. They include discussions and short lectures on physiology, delivery, care of the newborn, recognition of complications, and hygiene. After completing the classes, each TBA spends a probationary period of three or four days at an obstetric unit in the community. The trained TBAs are selected to work at obstetric units based on their leadership qualities, proximity to the unit, and literacy.

TBAs are taught to refer women who have a prenatal problem, especially eclampsia or hemorrhage; a complication of labor, including placenta previa or placenta abruptio; a malpresentation, and cases of cord or limb prolapse. They are also taught to consider for referral women under age 19 or over 35.

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A nurse visits the units once or twice a week, a physician less often. Nurses are not encouraged to visit more frequently, because it is felt that they may make the TBA feel inferior. Nurses do not attend deliveries; they help with record keeping, do vaccinations, provide pediatric and some prenatal care, and screen women for some cancers.

Although an earlier publication discussed factors correlated with referral, an in-depth analysis of these factors and the adequacy of the referral system was not conducted.[2] This paper fills that gap and addresses the following questions:

- What criteria do TBAs use to make referrals, and how do these criteria compare with what they are taught?
- Are these criteria appropriate, or should TBAs make more or fewer referrals?

Methods

Data were obtained on women delivering at four obstetric units—one located in a semi-urban area just outside Fortaleza (Lagoa Redonda) and the other three in rural areas (Aquiraz, Guaiuba, and Antonio Diogo)—and on women transferred to the Assis Chateaubriand Maternity Hospital (MEAC) from these obstetric units. Estimated travel time from the units to MEAC ranges from 20 to 90 minutes. This study was carried out over a 10-month period from October 1980 to July 1981. Records were obtained from all 1,878 women presenting at these units; 1,646 delivered at the obstetric units, and 232 were referred to MEAC.

A Maternity Record, developed by Family Health International, was used to collect information on women delivering at the obstetric units and on patients referred to MEAC. Women transferred to MEAC received a transfer slip from the referring unit indicating the reason(s) for their referral. Records were completed at the place of delivery with information on each woman's previous obstetric history, antenatal condition, management of her labor and delivery, and the outcome of her current pregnancy. Data collection activities at the obstetric units were supervised by two nurses, and at MEAC by a physician.

The AID (Automatic Interaction Detector) program used to analyze some of the data employs an asymmetrical branching process based on variance analysis techniques to divide the sample into a series of subgroups that maximize the ability to predict values of the dependent variable.[3] The program operates by finding the dichotomy based on any predictor that gives the lowest within-group sum of squared deviations for the dependent variable, Y, which in our case is the proportion of women referred. Essentially this is the dichotomization that "accounts for" more of the variance of

TABLE 1—Percentage of Women Referred to MEAC for Delivery and of Mortality of Infants, by Sociodemographic Characteristics

Sociodemographic Characteristics	Number of Cases	Per Cent Referred	Fetal Death Rate*	Neonatal Death Rate*
Age (years)				
<18	189	8.5	21	0
18–34	1439	11.1	12	6
≥35	249	22.1	44	8
Parity				
0	548	12.8	15	5
1–3	710	9.2	11	4
≥4	620	15.6	26	0
Education (years)				
0	666	14.7	24	9
1–4	1049	10.9	14	4
≥5	162	11.7	6	12
TOTAL	1878	12.4	17	6

*per 1000 pregnancies.
NOTE: Number of cases in categories does not always add to total because of missing information. Age of mother is unknown for one neonatal death.

the dependent variable (i.e., has a larger correlation with the dependent variable) than any other dichotomization based on grouping the categories of a single predictor into two groups.

Results

Among the patients of the four obstetric units only 8.6 per cent had had five or more years of education; 35.5 per cent had had no schooling (Table 1). Few (5.5 per cent) were covered by the urban or rural social insurance system; had they chosen to deliver in Fortaleza, they would have delivered at a charity ward (as did the referred women). Only one of the four obstetric units studied is located near a hospital.

Of the 1,878 women presenting at one of the four obstetric units, 12.4 per cent were referred to MEAC for delivery. Referral rates were higher for women aged 35 or older, women without a previous live birth, grandmultiparaes, and women without any schooling (Table 1). The percentage referred was higher for women who were reported to have a prenatal problem, had some complication of labor (including fetal distress), had a malpresentation, had a previous cesarean section, were pregnant with twins, or delivered before term (Table 2).

There were no maternal deaths. Thirty-two pregnancies (17 per 1,000) terminated as fetal deaths, and 12 infants died before discharge from hospital or obstetric unit (6 per 1,000). Mortality was higher in the groups for which referral rates were higher. (Since information is available on survival only until discharge, it is not possible to calculate perinatal mortality rates accurately. Women spend about 24 hours at an obstetric unit and about 48 hours at MEAC if they have uncomplicated vaginal deliveries. Women who have cesarean sections stay five nights or more. The probable early perinatal mortality rate was 23 per 1,000. The calculation of mortality rates includes only the most complicated twin of multiple births; there were eight pairs of twins delivered, of which one pair of twins died and the remaining babies survived. Inclusion of these deliveries would slightly raise the overall level of mortality.)

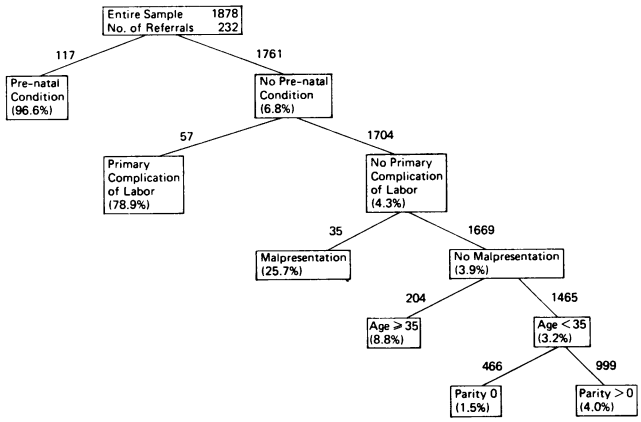
Criteria for Referral

The major conditions causing referral, as determined by AID analysis, were the existence of some prenatal problem (generally hemorrhage, preeclampsia, eclampsia, or premature rupture of the membranes), a complication of labor, or a malpresentation. Referrals of women having any one or combination of these conditions accounted for 167 (72 per cent) of the 232 referrals. Almost all (97 per cent) of the 117 women with a reported prenatal problem were referred; four-fifths of the 57 women with no prenatal problem but reported to have a complication of labor were referred; one-fourth of the 35 women with neither a prenatal problem nor a complication of labor but who had a malpresentation were referred (Figure 1). Since almost all women with a prenatal condition or a complication of labor were referred, there is little additional impact on referral. Other factors assumed to be associated with referral had little or no

TABLE 2—Percentage of Women Referred to MEAC for Delivery and Mortality of Infants, by Potential Indicators of Delivery Problems

Indicators of Referral	Number of Cases	Per Cent Referred	Fetal Death Rate*	Neonatal Death Rate*
Prenatal Problem				
Yes	117	96.6	128	43
No	1761	6.8	10	4
Complication of Labor				
Yes	68	89.7	191	73
No	1810	9.4	10	4
Presentation				
Malpresentation	68	57.4	103	59
Cephalic	1810	10.7	14	4
Fetal Distress				
Yes	58	82.8	17	9
No	1820	10.1	17	4
Previous Cesarean Section				
Yes	16	87.5	0	125
No	1859	11.7	17	5
Multiple Birth				
Yes	20	45.0	37	63
No	1858	12.0	17	6
Gestation (weeks)				
<37	35	68.6	229	114
≥37	1843	11.3	13	4

*per 1000 pregnancies.
NOTE: Number of cases in categories does not always add to total because of missing information.



Note: Percentages refer to the women transferred to MEAC for delivery.

FIGURE 1—Results from AID (Automatic Interaction Detector) Program Where Referral Status is the Dependent Variable

explanatory power; for example, even though TBAs are encouraged to consider patient age in making referrals, age was not an important factor in referral decisions.

For further analyses, the 167 women referred for one of three reasons (prenatal condition, complication of labor or malpresentation) were designated as the "high-risk referred" group; the other 65 referrals delivered at MEAC were designated "low-risk." Of the 1,646 women delivered at one of the four obstetric units during the 10-month study period, 1,604 were categorized as "low-risk not referred" and 42 were designated as "high-risk not referred." (Ten women referred to MEAC *after* delivery are not included in the referral group.)

Outcomes varied dramatically among the four groups. The proportion of non-surviving infants was 26 times higher in the high-risk referred group as compared with the low-risk not referred group. However, mortality rates were also high in the other groups (Table 3). While it is clear that the worst outcomes were found among high-risk referrals, outcomes were also poor among the low-risk referrals.

Low-risk Referrals

A review of the referral slips showed that 16 of the 65 low-risk referred group were referred to MEAC to be sterilized. We may assume that these women would not have been referred had they not requested sterilization. Of the remaining 49 low-risk referred women, 25 were referred because the TBA considered them to be high-risk; she indicated on the referral slips that the women experienced complications of labor (14), a prenatal problem (8), or a malpresentation (3). These diagnoses were not confirmed at MEAC. Two of these women had had previous cesarean deliveries (although this was not cited as the reason for referral) and received cesarean sections again.

Of the remaining 24 low-risk referrals, four experienced premature labor: of these, one woman delivered premature twins weighing <1000 grams each who died; another delivered a 670 gram fetus who died; both of the other babies were discharged alive—at birth, one weighed 1500gms, the other 2050gms. Of five women referred for cesarean section, four had had a previous cesarean. However, only one of the five had cesarean for this delivery, and her baby died.

TABLE 3—Outcome of Pregnancy by Risk and Referral Status

	Low-risk		High-risk	
Outcome	Not Referred (N = 1604)	Referred (N = 65)	Not Referred (N = 42)	Referred (N = 167)
% <2500g	3.8	13.9	21.4	16.8
% Apgar score <7 at 5 min.	1.1	6.7	14.3	18.7
Neonatal Death Rate*	4	62	71	114
Fetal Death Rate*	2	15	24	42

*per 1000 pregnancies.

In three cases in which the reported reason for referral was the suspicion of a twin presentation, one women had a singleton delivery; the other two women delivered twins who were alive at discharge.

Six infant deaths occurred in this low-risk referral group (including the low birthweight twins and the 670gm fetus). The remaining deaths included: an antepartum death of a 2900 gram fetus to a 17-year-old primipara, where the reason given for transfer was a malpresentation but the presentation was in fact cephalic; an antepartum death of a 3555 gram fetus to a 21-year-old with two previous stillbirths and no live births, where the reason for transfer was high blood pressure but no antenatal problem was recorded; and an antepartum death of a 3630 gram fetus to a 37-year-old with 12 previous live births, where the reason for transfer was inability to deliver the rest of the fetus after the head had been delivered.

Although some problem-free women were undoubtedly referred, it is difficult to determine how many. Clearly, in some cases, the TBA made an error, as with the suspected twin presentation that turned out to be a singleton delivery. In two transfers in which the TBA reported placenta previa as the reason, the Maternity Record did not record placenta previa as a complication of labor, nor did the women have cesarean sections. However, in most of the other cases, it is not clear whether the TBA made an error. For example, TBAs referred patients because they suspected a breech presentation, but the women had cephalic presentations at delivery. In such cases, the position of the babies might have changed during labor. In several other cases, prolonged labor or failure to progress was the reason given for transfer, but the Maternity Record indicated no problem.

The infant death rate was relatively high in both referral groups, although higher in the high-risk group. The high mortality may be attributed in part to the high proportion of low birthweight babies in both groups. The proportion of babies with Apgar scores less than seven was higher in the high-risk than in the low-risk group.

High-risk Non-referrals

We compared the 42 high-risk cases not referred with the 167 high-risk patients who were referred, according to the problem experienced (Table 4). Referred women were more likely to have some prenatal problem, but less likely to have a malpresentation. However, all women with transverse presentations were referred. A much higher percentage of

TABLE 4—Antenatal Condition, Presentation, and Labor Complications for High-risk Women by Referral Status (percentage distribution)

Potential Indicators	Not Referred (N =42) %	Referred (N = 167) %
Prenatal Problem		
Yes	9.5	67.7
No	90.5	32.3
Presentation		
Vertex	33.3	77.8
Brow/face	35.7	3.6
Breech	31.0	12.6
Transverse	0.0	5.4
Compound	0.0	0.6
Complications of Labor		
Yes	9.5	36.7
No	90.5	63.3
Fetal Distress		
Yes	23.8	28.7
No	76.2	71.3

referred than not-referred women experienced some complication of labor, especially prolonged or obstructed labor.

Of those not referred with a breech presentation, only two had any other problem recorded. In contrast, all but two referred women with a breech presentation had other problems. Six of the not-referred women with breech presentations were primigravidas. TBAs are especially encouraged to refer this group. Thus, while women with transverse or compound presentations are always referred, women with breech presentations were likely to be referred only if they experienced other problems. When questioned about why they did not always refer women with breech presentations, TBAs said there was no reason for referring breech cases unless there are other problems. Also, some women may have been encouraged to deliver at MEAC but refused to do so. Brow and face presentation referrals may have been low because they are not recognized in time to transfer. This may also explain why some women with breech presentations were not referred.

Three of the four deaths in this group were fetal deaths. One was to a woman with an antepartum hemorrhage and placenta abruptio. She delivered a stillborn infant weighing 1900 gms. A second woman, reported to have preeclampsia, delivered a stillborn infant weighing 2200gms. The third stillborn, to a woman reported to have fetal distress during labor, weighed 2700gms. The postpartum death was an infant weighing 4100gms who also experienced fetal distress.

Discussion

For most women living in the communities served by the obstetric units, home delivery is the only alternative to delivery at or referral from an obstetric unit. While the patients at the units are of low socioeconomic status (fewer have had secondary school education than not-referred women delivering at MEAC), it is not known how their characteristics compare with women who deliver at home.

The proportion of infants who survived to discharge was highest among the low-risk not-referred group and lowest among the high-risk referred group. Infants in the other two groups (high-risk not-referred and low-risk referred) had survival rates intermediate to these extremes. This suggests that while the three factors used to categorize women into risk groups identify a high proportion of women who have problems (as witnessed by the high death rate of their infants), they have not been sufficient to identify all women with problems.

TBAs are instructed to refer women to MEAC if they have certain pregnancy complications or are in a particular age group. Among the high-risk women, those with the most serious complications are always referred, but those with less serious problems are not always referred; this latter group includes some women with breech presentations.

Some women who were referred because a TBA considered them to be "high-risk" were not so designated at MEAC. Since TBAs are encouraged to refer any woman whom they consider to have a problem, some mistakes are to be expected. Underreferral, on the other hand, leads to an increase in mortality rates.

Even though it may be argued that some women have been inappropriately referred whereas others who should have been referred were not, the outstanding finding of this study is the very low overall level of mortality (2.4 per cent) compared to mortality of not-referred public patients at MEAC (5.9 per cent).

The system of referral to MEAC was designed to allow the TBAs to attend uncomplicated deliveries and to refer women with complications. In general, this is what they did. While some improvements in the referral system could perhaps be made, it is clear that the present system is working well in saving scarce hospital resources to treat only the most complicated cases.

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