

Original Article

The Effect of Antenatal Care on the Probability of Neonatal Survival at Birth, Wad Medani Teaching Hospital, Sudan

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Abstract

Objectives: This study is a comparative prospective cohort study testing the hypothesis that "there will be positive and established effects of each quality type of antenatal care intervention on neonatal survival at birth" by disproving the alternative hypothesis.

Method: A sample of 236 deliveries was selected. All the respondents were primigravidae with their quality type antenatal care recorded. All pregnancies outcome (still-or-live birth) was examined and then recorded together with mothers' health state. Further analysis was carried out using log-linear and logistic regression.

Results: According to the applied scoring system 98 were sorted out as "good" women, 55 as "moderate" and 83 as "bad" in terms of their state of health. Women, who received "good" antenatal care, were 106. Only 2(1.08%) had stillborn babies, while 57 who received "moderate" antenatal care had 8(14.03%) stillbirths. Those who received no services (73) ended with 16(21.09%) stillborn babies.

Data was standardized for the influence of antenatal care, coded, computed and conclusions driven. Women having good health and receiving good antenatal care services are more likely to have live-born babies in opposition to those who had bad health and had no antenatal care.

The odds of having a live-birth is 11.807 greater among women who had good antenatal care and good health than those who lacked good health and had no antenatal care services.

Different combinations of variables could also show that antenatal care is the decisive variable in pregnancy desirable outcome (live-birth).

Conclusion: The frequency of stillbirth was very high (31.11%) among women categories "bad health" and "no antenatal care". Adequacy of antenatal care is strongly and consistently associated with birth outcome..

Key words: Antenatal Care, Neonatal Survival, pregnancy

Introduction

Death of an infant in utero or at birth has always been a devastating experience for the mother and of concern in clinical practice. Infant mortality remains a challenge in the care of pregnant women worldwide, particularly for developing countries. Both pregnancy and childbirth are believed to render the woman and her expected child exceptionally susceptible to the evil of man, nature and the supernatural; hence the pregnant women are

placed under special treatment which requires the commitment of the subject, kin and community.

At pregnancy, special diet is enforced, physical and ritual practices are imposed, preventive and curative measures in a form of antenatal care are placed at hand all to protect the woman and her child at this sensitive period of their lives.

As per Safe Motherhood Initiative all pregnant women must receive basic but professional antenatal care, nevertheless just third of the women

population have received it from doctors ⁽¹⁾. The national stillbirth rate ranges from 1.1% to 3.0% ⁽¹⁾. This research attempts to ascertain and emphasizes the decisive role and need for antenatal care in the desired outcome of pregnancy (live-born baby) and facilitate its promotion for the benefit of the target population.

Method

This study is a comparative prospective cohort study testing the hypothesis that "there will be a positive and established effects of each quality type of antenatal care intervention on neonatal survival at birth" by disproving the alternative hypothesis. For this, all pregnancies outcome (still-or-live birth) during the period 15th July 2001 to 15th of October 2001 were recorded together with mothers' health state prior to delivery. A total of 236 deliveries conducted at Wad Medani Teaching Hospital who received different antenatal care qualities constituted the sample size of the study.

For this purpose antenatal care was expressed in a ranking order:

Strata 1: Most adequate service.

Strata 2: Moderate or inadequate service.

Strata 3: Least (having no service).

To collect baseline data the interview of respondents was undertaken in Wad Medani Teaching Hospital using an Arabic pre-tested questionnaire, laboratory and clinical examination.

Collecting the data, respondents were then stratified as: women having good antenatal care, women having moderate antenatal care and women having no antenatal care services.

To establish the influence of antenatal care, population was standardized for: mother health state, quality of antenatal care and newborn (outcome).

For the study validity antenatal care was defined according to contents analysis of basic minimal needs and mothers' health state was defined according to Hobel (1973). Stillbirth outcome was taken as the absence of survival signs of babies whose each one gestational age was not less than 28 weeks.

The prediction of expected outcome related to the interaction of variables understudy is that: women who regularly go to antenatal care services and have good health as well are more likely to have live-birth, while women who have bad health and have no antenatal care services are more prone to have dead babies. On the other hand women who have good health and receive no or insufficient antenatal care services are more likely to have a live-birth, except in very few cases, where there were some medical problems that increase their liability to have stillborn babies.

Results

According to the applied scoring system 98 women were sorted out as having "good" health, 5(5.10%) of them had stillbirths, 55 were sorted out as moderate health women, 4(7.27%) of them had stillbirths, 83 were sorted out as "bad" health women and 17(20.48%) of them had stillbirths (table 1).

Table 1: Different combinations of indicators with the end outcome *

Antenatal care (ANC)	Live birth-(210)			Stillbirth (26)			Total
	M ⁺	M	M ⁻	M ⁺	M	M ⁻	
Good	68	16	20	0	1	1	106
Moderate	16	18	15	3	3	2	57
No.	09	17	31	2	0	14	73
Total	93	51	66	5	4	17	236

* The symbols M⁺, M, M⁻ denotes mothers of 'good', 'moderate' and 'bad' health respectively

Women who received “good” antenatal care services were 106. Only 2 of them had stillborn babies, while 56 who received “moderate” antenatal care had 8 stillbirths. Those who were receiving no services (73) ended with 16 stillborn babies.

Women who regularly go to antenatal care institutions and have good health as well are more likely to have live-births while women who had bad health and had no antenatal care services were more prone to have dead babies and women who had good health and receive no or insufficient antenatal care services are more likely to have live-births except in a very few cases, where there were some medical problems that increase their liability to have stillborn babies.

The probability of having live birth is significantly ($P=0.001$) related to ANC. The probability of having a live birth tends to increase as with going to ANC compared to not going to ANC.

The estimated odd ratio is = 1.38 with 95% C.I. 0.4923, 2.2677 indicating that the odds of having a live birth by going to ANC. is 1.38 greater than that for not going to ANC.

The partial logistic regression coefficients showed that the estimated probability of having a live birth to be significantly related to ANC. and health but not age ($0.1 < P < 0.2$).

The odds for good ANC. relative to that for bad ANC. is 4.78 (95% C.I. 0.7574, 2.3826).

Among women with the same age, the odds of having a live-birth with bad health and good ANC is 4.78 times greater than with bad health and not going to ANC. The odds of having a live birth among women who, have good health but do not go to ANC is 2.47 greater than that for women with bad health and never go to ANC. The odd of having a live birth among women who have good health and go to ANC is 11.807 greater than those who had bad health and never go to ANC.

Discussion

Strata 1: Good ANC. Women

Completed samples have covered 106 women receiving 'good' antenatal care, 105(96%) of them were under close supervision of doctors in their private clinics and 53(50%) of them fall in the category of high family income. Unexpectedly most of them 70(66.67%) reside in the nearby rural catchments area of the town.

All were married and live with their husbands except for one divorced.

Data showed that, an educational level of high secondary school was dominant (36.38%), while illiteracy formed only 5.6%. The remaining percentage was left for university, elementary and intermediate levels. Good housing (83%), good nutrition (85%), liberation and detachment from the deleterious effect of taboo (9.43%) reduction of amount of work (53%), taking drugs prescribed by only health professionals (78.30%) and proper treatment of infections without undue delay.

There were 16(15.09%) cases of pre-eclampsia, 2(1.89%) of hypertension 3(2.38%) cases of nephritis, 9(8.49%) of contracted pelvis and 2(1.89%) cases of breech presentation. 82(77.36%) women had normal vaginal deliveries and 18(16.98%) ended in a lower segment caesarian section the rest were breech, and forceps deliveries. Thanks to their antenatal care that 103(97.17%) had their deliveries at term. Of all women population, only one woman (0.94%) had an anoxic baby and only 2(1.9%) had still-born babies.

The odds of having a live-birth among women who have good health and go for antenatal care was 11.807 greater than those who had bad health and never go for antenatal care. This shows clearly the decisive role of antenatal care and good health. Adequacy of care is strongly and consistently associated with birth outcome, the effect of prenatal

care differs by mother's risk category, and perinatal mortality increases as care declines ⁽²⁾.

Further, the data showed that the odds of a live birth to a mother of bad health but go to antenatal care is 4.78 times greater than to a one having a bad health and moreover did not enjoy antenatal care services. This shows clearly that antenatal care is the decisive variable (logistic regression).

Strata 2: Moderate ANC. Women

They were the recumbent of 'moderate' antenatal care services. Antenatal care potentials have been carried out by health visitors except for 10 women. The total number of respondents was 57. Number of stillbirths was 8(14.04%).

Considering individual characteristics, immediate environment and state of health, individuals in this strata stand midway between women of 'good' health and women of 'bad' health.

Strata 3: Bad ANC. Women

The population in this strata represents women (73) receiving no antenatal care services.

64(87.67%) were housewives while 9(12.33%) have other different occupations mainly workers in the cotton growing Gezira and Rahad Schemes.

There, in the first strata, the data has failed to include Christians, wherein succeeded to attract 9(12.33%) of them. These were all southerners, who immigrated to the area looking for a job or security.

Respondents were mostly 56(76.71%) rural dwellers and immigrants 4(5.48%), who carry their old cultures and believes having very little or no appreciation for preventive and promotive aspects of health.

The predominant age group in the whole study population was the age group 15-35 years, however, the extreme ages in this strata measure up to 6 members (10.53%). 12(16.44%) of the group members could give no information concerning their age.

It is surprising that 17(23.29%) were of short stature, nevertheless, only 5 of them were considered to have contracted pelvises for probably low birth weights babies.

The rate of absolute illiteracy among these women runs at 68.49%. Women who have been to school did not go beyond the primary school level. Women also seem to be excluded from making use of the Khalwa (Koranic School). The education of women is negatively affected by marriage as it takes place when women are supposed to be schooling. There is little evidence that educated respondents benefited from their schooling in reshaping their traditional knowledge in pregnancy and its implications. 58(79.45%) were of low family income and poor housing. 57(78.08%) were of poor personal hygiene, daily ill and negative attitude towards antenatal care. There were relatively more cases of anaemia (21.06%) compared to the first strata and the combination (anaemia + infection) had a greater prevalence 13(22.81%), while there were no cases of Antipartum hemorrhage or the combination (infection and Anti-partum hemorrhage.). 8 cases of minor infections and one case of infective hepatitis were reported. There were 7(12.28%) cases of pre-eclampsia (less than those in the first strata).

More than ½ of the deliveries 46(63.01%) were attended as normal vaginal deliveries, while lower segment caesarian section was done for 23 x (31.5%) cases because they were mostly admitted in urgency, contracted pelvis and inertia.

There were no mentionable serious intranatal complications in this strata. However, 14(19.18%) of women of "bad health" category had stillborn babies- quite bigger than the national survey figure that ranges from 1.4 to 3.0% ⁽¹⁾. This disparity could be due to the fact that these were mostly hospital emergency cases. 4(5.48%) ended with premature live-births.

The number of stillbirths in the whole study population was 26 cases. 16(53.84%) of them lie within this strata. 11(68.75%) were illiterate and of low family income. While 7(26.92%) of the husbands were illiterate and of low income.

50(68.75%) of women who ended with stillborn babies were absolutely illiterate or of poor education and low family income. The frequency of maternal attendance at antenatal care centers was significantly related to maternal education⁽³⁾.

In Conclusion the frequency of stillbirth was very high (31.11%) among women categories "bad health" and "no antenatal care". Adequacy of antenatal care is strongly and consistently associated with birth outcome. Its effect differs by mother's risk category, and stillbirths increase as antenatal care, education and income decline.

Recommendations include application of appropriate antenatal care services. Improve the efficiency, effectiveness and coverage of health

care institutions. Ensure female education and sustainable family income.

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