

# MATERNAL CARE RECEPTIVITY AND ITS RELATION TO PERINATAL AND NEONATAL MORTALITY A RURAL STUDY

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## ABSTRACT

*A longitudinal study was conducted on 212 pregnant women from May 1987 to April 1988. Maternal Care Receptivity (MCR) "an innovative approach" was adopted for the assessment of maternal care services provided to pregnant mothers at their door steps. During follow-up, scores were allotted to each of the services rendered and antenatal status of pregnant women. Depending on the score—MCR was classified as high (11 to 8), moderate (7 to 4) or poor (3 to 0). Perinatal and neonatal deaths were recorded and an inverse relationship between MCR and perinatal and neonatal mortalities was observed ( $z = 5.46$ ,  $p < 0.0001$ ). Significantly, no perinatal or neonatal deaths occurred in women with high MCR. One of the most important cause of high PNMR and neonatal mortality rate in developing countries is poor MCR, i.e., under utilization of even the existing maternal health services. The main reasons for this under utilization appear to be poverty, illiteracy, ignorance and lack of faith in modern medicine.*

**Keywords:** *Maternal care receptivity, Perinatal mortality, Neonatal mortality.*

In a developing country like India, where the status of women is still very poor, even the existing primary health care is not properly and fully utilized. Thus, it is essential to assess the utilization of already existing maternal health services, particularly the receptivity of the pregnant women to antenatal services provided to them at their door steps.

The first level of maternal and child health care within the health care delivery system is the home and the community. It is estimated that nearly 80% of the task of Primary Health Workers could be related to health care of mothers and children(1) and over 5 million infants are still-born or die within the first week of life(2).

The perinatal and neonatal period, inspite of shortness, is recognized as the most critical phase in the human life span, contributing greatly to deaths from both immediate and long term causes. Reasonable maternal care during this period can go a long way to prevent the heavy cost, both in human and economic terms, to the society due to physical and mental disabilities associated with the perinatal period(3,4).

The present study was conducted in a rural area of Western Uttar Pradesh with a view to assess the receptivity of

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the antenatal services provided to the pregnant women at their homes, by using a modified scoring system, especially recommended for rural areas and its impact on perinatal and neonatal mortalities.

### Material and Methods

In the Jawan Community Block, District Aligarh, Uttar Pradesh, four villages namely Oriha, Nagola, Rampur and Chandokha with a total population of 7,541, were randomly selected. Two hundred and twelve pregnant women, in different trimesters, were registered by visiting all the households in the selected villages and were followed up every month till delivery and in the neonatal period. The study was conducted for one year from May, 1987 to April, 1988. Health care facilities were mainly provided by Primary Health Centre, situated in village Jawan, catering to a population of 1,69,399 and the study area was also covered by ICDS scheme. Pregnant mothers had poor utilization of existing primary health care services due to difficulties in transportation, long waiting hours and socio-economic reasons in the study area. Therefore, for assessing the acceptability of the ante-natal services by the pregnant mothers, these three factors were overcome by providing the services at the door steps.

To find out how receptive the pregnant mothers were to antenatal services when provided at the door steps, "an Innovative Approach" was developed by scoring the factors, namely (i) Time of commencement of antenatal care; (ii) Frequency of antenatal home visits availed; (iii) Number of doses of tetanus toxoid immunization accepted; and (iv) Place and person attending the delivery.

Weighted scores were assigned to each of these factors (*Table 7*); the scores of the four factors were added to give the 'Maternal Care Receptivity' (MCR). Depending on the score achieved by each woman, MCR was classified as high (11 to 8), moderate (7 to 4) or poor (3 to 0). This scoring system was earlier used by Srinivas and Venkatesh(5).

The perinatal and neonatal mortality was recorded and its relationship with MCR was assessed. For the statistical analysis, Chi-square and Z test were used.

Antenatal care provided in the homes of pregnant women included a routine clinical history, a thorough general physical examination and obstetrical examination, including fundal height, the presentation of the fetus, and recording of fetal heart sounds at every visit. Whenever necessary, per vaginum examination was also carried out. Investigations like hemoglobin (Sahli's method), urinary albumin and blood grouping (ABO and RH factor) were also done. Tetanus toxoid was administered as per schedule. Calcium, iron and folic acid tablets were given every month during the antenatal visits. Health education was provided at each visit to the pregnant women.

Details regarding the newborn and complications developed during or after the delivery and in the neonatal period were recorded by the doctors with the help of traditional birth attendants. Facilities availed at the time of delivery were according to the choice of the pregnant women.

### Results

Of 212 pregnant women registered,

TABLE I—Scoring Procedure for Assessment of Extent of Utilization of Maternal Care Services

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A.	Time of commencement of antenatal care 12 weeks(3), 13-24 weeks(2), 25-33 weeks(1), 33 weeks(0)
B.	Frequency of antenatal home visits availed 5 visits(3), 3-4 visits(2), 1-2 visit(1), Nil(0)
C.	Number of doses of tetanus toxoid immunization accepted 2 and more or 1 booster(2), 1 only(1), Nil(0)
D.	Place and person attending the delivery
	(a) For deliveries in hospital/health centre
	(i) If the woman had three or more antenatal home visits(3)
	(ii) If the women had one/two antenatal home visits(2)
	(iii) If the women did not attend the primary health centre(1)
	(b) For home deliveries:
	(i) If the women had 3 or more antenatal home visits and the delivery was conducted by trained traditional birth attendant (TBA) or mid-wife(3)
	(ii) If the woman was in the high risk group, had antenatal care and the delivery was conducted by trained TBA or mid-wife(2)
	(iii) If the woman had one/two antenatal home visits and the delivery was conducted by trained TBA or mid-wife(2)
	(iv) If the women did not attend the PHC and the delivery was conducted by trained TBA /mid-wife(1)
	(v) If the delivery was conducted by an unskilled person/UTD (untrained Dai)(0)

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\* Figures in parenthesis indicate the scoring pattern for all the variables.

2 women refused antenatal checkup even when the services were provided at the door steps. On the basis of a questionnaire, it was found that no pregnant women had received any kind of antenatal care from primary health centre during her previous pregnancies. Only 18.8% women had received tetanus toxoid injections from the private practitioners. Of 212 women, 185 (87.3%) received some nutritional supplements, whereas 27 (12.7%) did not receive any supplement, out of these 185 women, 31 (16.7%) did not take the iron and folic acid supplement given to them.

Hemoglobin (Hb) was estimated in

196 pregnant women (16 women refused to give blood for estimation). The mean Hb was 8.9 g/dl. Only two women were severely anemic (Hb between 5 to 6 g/dl). Blood grouping was carried out in 180 pregnant women. The commonest blood group was 'B' found in 90 (50.0%) women. Only one woman in 208 had albumin in excess, *i.e.*, woman with pre-eclamptic toxemia (PET). Twenty five per cent women had albumin in traces which is considered normal during the course of pregnancy.

Vertex presentation was found in 204 (96.2%) women and breech presentation in the remaining 8 (3.8%). All the

women with breech presentation preferred being delivered at home by Traditional Birth Attendants (TBAs) even after being referred to the hospital. Only two women delivered in the hospital, one with a bad obstetrical history and PET, (who had intrauterine death in hospital) and the second who had previous LSCS.

Utilization of maternal care services in four villages was assessed in terms of maternal care receptivity, based upon scoring system. Of 212 women, 36 (17%) had poor, 161 (75.9%) moderate and 15 (7.1%) had high maternal care receptivity score (*Table II*).

The proportion of women with moderate MCR is much higher as compared to those having either poor or high MCR score because antenatal check up were done at home and weighted scores were allotted to them.

### **Perinatal Deaths**

Seventeen perinatal deaths [11 (64.7%) were males and 6 (35.3%) females], occurred in the sample studied, which included 5 (29.5%) still births and 12 (70.5%) under one week of age (*Table III*). The difference between male and female perinatal deaths was not statistically significant ( $\chi^2 = 0.402$ ). The perinatal mortality rate (PNMR) among boys and girls was 91.7 and 67.4/1000 total births, respectively and the overall PNMR was 81.3/1000 total births. Causes of perinatal deaths were: breech 3 (17.6%), congenital defects and prematurity 2 (11.7%) each, cord prolapse, jaundice and fetal distress 1 (5.8%) each; whereas in the remaining 2 (11.7%) cases the cause could not be ascertained, because the doctor could not reach the

place of delivery and Traditional Birth Attendant (TBA) could not explain the cause of death.

### **Neonatal Death**

During the period of study, 13 neonatal deaths, 7 (60.9%) in males and 6 in (67.4%) females were recorded; neonatal mortality rate being 63.7/1000 live births (*Table IV*). The difference between male and female neonatal deaths was not statistically significant ( $\chi^2 = 0.074$ ). These 13 neonatal deaths included 12 deaths under 1 week of age and the causes were—breech 3 (23.1%), congenital defects and prematurity 2 (15.4%) each, and meningitis, cord prolapse, jaundice and fetal distress 1 (7.7%) each, while in the remaining 2 (15.4%) the cause could not be ascertained.

### **MCR Grading in Relation to Perinatal and Neonatal Mortality Rate**

Perinatal mortality rates were found to be 90.9, 86.9 and zero/1000 births in women with poor, moderate and high MCR grading, respectively (*Table II*).

In women with higher MCR grading, no neonatal death occurred, while the neonatal mortality was 93.8 and 63.7/1000 live births in women with poor and moderate MCR grading, respectively (*Table II*). An inverse relationship between maternal care receptivity and the mortality rates was observed which is statistically significant ( $Z = 5.46$ ,  $p < 0.0001$ ).

### **Discussion**

It is evident from this study that even though the antenatal care was provided at the door steps, all the women did not avail all the services because of poor receptivity; which was prevailing

TABLE II—MCR Grading in Relation to Perinatal and Neonatal Mortality

MCR Grading	Total No. of Women	Outcome of Pregnancy			Perinatal Mortality			Neonatal Mortality	
		Live birth	Still birth	Total	Death under one week	PNM	PNMR	Neonatal Deaths	Neonatal Mortality Rate
Total Group									
Poor	36 (17.0%)	32	1	33	2	3	90.9	3	93.8
Moderate	161 (75.9%)	157	4	161	10	14	86.9	10	63.7
High	15 (7.1%)	15	0	15	0	0	00.00	0	00.0
Total	212 (100.00%)	204	5	209	12	17	81.3	13	63.7

(z = 5.46, p < 0.0001) Statistically significant.

TABLE III—Perinatal Mortality According to Sex

Sex	Live Births + Still births	Perinatal deaths	Perinatal mortality rate per 1000 total births
Male	120 (57.41%)	11 (64.70%)	91.7
Female	89 (42.59%)	6 (35.30)	67.4
Total	209 (100.00%)	17 (100.00%)	81.3

( $\chi^2 = 0.402$ ) Statistically not significant

TABLE IV—Neonatal Mortality According to Sex

Sex	Total live births	Neonatal deaths	Neonatal mortality rate per 1000 live births
Male	115 (56.38%)	7 (53.85%)	60.9
Female	89 (43.62%)	6 (46.15%)	67.4
Total	204 (100.00%)	13 (100.00%)	63.7

( $\chi^2 = 0.074$ ) Statistically not significant

in the study area, due to ignorance, illiteracy and poverty. Women have deep rooted faith in the TBA's and therefore pregnant women did not feel the necessity of utilizing services from PHC.

It is evident from the present study that anemia is still widely prevalent among pregnant women particularly in the rural areas. Even after iron and folic acid supplementation, anemia persisted in 62.2% of pregnant women.

A WHO task force on risk approach for improved maternal and child care has recommended development of such scoring systems by allocating ad hoc number of points for each characteristic based on experience especially in the rural areas(6).

It may be argued that the weightage given to various factors are on numerical scale and are arbitrary and may not measure the exact impact or risk of the outcome of the pregnancy(5).

If home based antenatal visits had not been made, then the proportion of women with poor MCR would have been much higher than that shown in Table II. Only 7.1% of the women had high MCR. It might be attributed to: illiteracy, poverty and a high proportion of home deliveries.

The PNMR was 81.3/1000 births. This rate is much higher than the national figure of 33.9/1000 and that of 48.6/1000 total births reported from rural areas of Pune (Maharashtra) as the quality of antenatal care (ANC) cannot be improved in the rural areas because of poor receptivity(7). However, this is less than 93/1000 reported from Uttar Pradesh(8) and is a reflection of ANC provided to the women at their home. We must ensure some kind of ANC in rural areas so that they can learn to utilize the services which are provided to them.

Park quoted that a minimum of 4

antenatal visits covering the entire period of pregnancy should be the target in rural areas, of which at least one visit should be in the home of the pregnant women(9).

Srinivas and Venkatesh reported, that PNMR in women with poor, moderate and high MCR grading was 146,58 and 56 respectively(5). Perinatal mortality rates in relation to frequency of antenatal care were compared in a study conducted by WHO in South East Asia (Burma, Indonesia, Thailand, India) and it was shown that, with no antenatal care, PNMR was 97, whereas it was only 5 after full antenatal care(7).

The neonatal mortality rates reported by Srinivas and Venkatesh were 79, 28 and 26 in women with poor, moderate and high MCR grading respectively^). Agarwal and Agarwal reported a neonatal death rate of 74.6 in UP and 94.5 in Bihar. They also observed that it varies from 52.4 to 128 in Bihar and from 59.0 to 98.0 in UP(10). However, based on hospital statistics, PNMR in India varies from 50 to 150 or even more as compared to 10 in Sweden(11).

A significant proportion of neonatal mortality in the country results from lack of proper care during delivery leading to birth injuries and infections—mainly tetanus. Proper medical care at delivery can reduce the risk of death from birth injury/or tetanus(12). However, in the present study due to 98% coverage of tetanus toxoid no death due to tetanus neonatorum was observed. Significantly, in the present study no perinatal or neonatal mortality was observed in women with high MCR score (score 11-8). On the

other hand, very high perinatal mortality and neonatal mortality rates were observed in pregnant women with poor maternal care receptivity (score 3-0). High risk pregnancies should be identified in rural areas through a persistent and effective health education programme which would lead to an appreciable decline in perinatal and neonatal mortality(13).

Only 7.1% women had high MCR grading. This finding clearly shows, that in the rural areas of India, there is tremendous under utilization of basic primary health care as a result of ignorance, illiteracy, poverty and lack of faith in the modern system of medicine. Very high perinatal and neonatal mortality rates might be attributed to the fact, that a large proportion of pregnant women had either poor or moderate maternal care receptivity.

It can, therefore be concluded from this study that one of the most important determinants of perinatal and neonatal mortality in a developing country is still the poor maternal care receptivity. It is important to generate awareness among the pregnant mothers by constant health education so that mothers become receptive to the services being provided to them during antenatal, and postnatal period.

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