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## Report

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### **A MULTICENTRE COLLABORATIVE STUDY OF THE CARE OF MOTHERS AND INFANTS WITH A COMPREHENSIVE MCH CARE PACKAGE UTILIZING HIGH RISK APPROACH STRATEGY AT PRIMARY HEALTH CENTRES: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

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The present Task Force Study on "Care of Mothers and Infants with Risk Approach Strategy" was initiated by the Indian Council of Medical Research (ICMR) in October 1985. The major objective of this action oriented study was to develop a comprehen-

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*Abstracted from the report on this collaborative study published by the Indian Council of Medical Research, New Delhi, 1994. The Principal Investigators for this study were: Delhi-CS Chuttani, Chandigarh-G.I. Dhall, Gwalior-A.K. Govila, Lucknow-P.K. Misra, Varanasi-A. Prakash, Pune-V.N. Rao, Jaipur—R. Sharma, Ahmedabad-L.B. Trivedi.*

sive package of interventions for improving the maternal and child care, by adopting the approach of identification and management of high risk pregnant mothers and their offsprings within the existing health care delivery system at Primary Health Centre (PHC) level. The following specific approaches of interventions were utilized for developing the comprehensive MCH care package: (i) By training the team of existing health personnel in the early identification and efficient management of high risk pregnant mothers and newborns; (ii) By educating the community and mobilizing the community resources towards identification and management of high risk pregnant mothers and newborns; (iii) By developing a feasible referral system towards management of the risk factors in pregnant mothers and newborns; and (iv) By developing an inbuilt system of collecting health statistics including vital statistics relevant to the monitoring and evaluation of the programme.

The study was conducted through eight collaborating centres located in the different parts of the country, in the states of Uttar Pradesh, Madhya Pradesh, Rajasthan, Haryana, Maharashtra and Gujarat. These centres selected a Primary Health Centre (PHC) with an approximate population ranging from 80,000-1,00,000 according to the selection criteria laid down by the ICMR. One of the major pre-requisite for the selection of the area of the study was that there should be no ongoing active intervention programme in that area and that the Infant Mortality Rate (IMR) of that area should be similar to that of the State.

In this action oriented operational

research study, the State Health Directorate, *i.e.*, District Health Officers were actively involved as one of the Principal Co-investigators along with other three Principal Co-investigators from the collaborating centres representing the disciplines of Gynecology and Obstetrics, Pediatrics and Community Medicine. Regular state level meetings with the Chief Medical Officers and District Health Officer, of the study area along with the Principal Co-investigators were held. "Monthly meetings were also organized with the Block Medical Officer, ICMR's research staff and the paramedical workers at the block level for the smooth implementation of the project. Initially, everybody was briefed about the study protocol as well as the objectives of the IMR project proposed to be initiated at the selected Primary Health Centres. Regular reports collection for MCH activities were done by the ICMR's research team and monthly reports were sent to ICMR headquarters. During the monthly meetings with the state health authorities, various problems regarding the

implementation of the project and their remedial measures were discussed in detail.

The Primary Health Centres selected for the study by different collaborating centres are shown in *Table I*.

The study was carried out in three phases. The first phase was the situation analysis phase which was for a period of 6 months. The situation analysis revealed that population covered by each PHC was variable and ranged between 80,000-1,69,000 except in the state of Maharashtra where 30,000 population norm for coverage by the PHC had been implemented. Majority of the villages were located at quite a distance from the PHC, sometimes as long as over 30 km from the PHC. This could also be an important factor for the utilization of referral mechanism for MCH care which was hardly in existence at these PHCs.

The situation analysis also indicate that the infrastructural facilities in terms of physical space, equipment and general drugs were very poor, except for the facilities for

TABLE I—Details of Selected Primary Health Centres.

S. No.	Collaborating centre	PHC	District	State
1.	Banaras Hindu University, Varanasi	Cholapur	Varanasi	Uttar Pradesh
2.	University College of Medical Sciences, New Delhi	Farukhnagar	Gurgaon	Haryana
3.	Postgraduate Institute of Medical Education and Research, Chandigarh	Pinjore	Ambala	Haryana
4.	G.R. Medical College, Gwalior	Hastinapur	Gwalior	Madhya Pradesh
5.	K.G. Medical College, Lucknow	Mohanlalgunj	Lucknow	Uttar Pradesh
6.	Indian Institute of Health Management Research, Jaipur	Phagi	Jaipur	Rajasthan
7.	K.E.M. Hospital, Pune	Kendur	Pune	Maharashtra
8.	B.J. Medical College, Ahmedabad	Adalaj	Ahmedabad	Gujarat

immunization such as refrigerator and vaccines under universal immunization programme. The manpower resources were satisfactory.

The observations of the skills of health functionaries indicated that the antenatal check ups were carried out by them solely with the purpose of distribution of Iron Folic Acid tablets and Tetanus Toxoid immunization. None of these health functionaries correlated the findings of their examination of the pregnant women with the possible detection of risk factors and subsequently for the purpose of referrals. No records were maintained by these functionaries for the periodic antenatal examination during the subsequent visits of pregnant women. During the intranatal period, safe delivery kits were not used by the ANMs and Dais. In addition, no records regarding postnatal care were available and the care was limited to breastfeeding, diet and family planning.

As regards to the status of data recording, the number of births, deaths and infant deaths recorded at these health centres reflected gross under reporting. There were no records of any kind of referrals made from sub centre to PHC and onwards.

The gaps thus identified during this phase of situation analysis were bridged with the help of state health authorities during the preparatory phase of intervention, especially the physical infrastructure and ancillary facilities. Other activities carried out during the preparatory phase included the preparation of training manuals, health education materials, development of systematic records in the form of MCH cards and registers.

During the preparatory phase, a baseline survey was also carried out in each PHC

area to obtain household information, to determine the denominators for pregnancy and vital rates and FP/MCH practices. A sample of 2000 households was selected, proportional to the size of the population. The baseline survey showed that the overall age distribution of 15-44 yr age group was 45%; 47.7% of the family size was composed of 2 to 5 members; 50% had nuclear family and the average literacy was 43.7%.

The main intervention strategies used in the comprehensive MCH care package for this study were: (i) Training and re-training of the medical officers/paramedical workers at the PHC; (ii) Community education; (iii) Development of improved data record forms/cards; and (iv) Development of referral system.

The interventions at the PHCs were initiated from September, 1987 and continued until December, 1990 in all the centres. Initially, the interventions were tried out in one-third of the study area of the PHC till March 1990, and thereafter it was expanded to the rest of the two-thirds area of the Primary Health Centre.

The pregnant women during the study period were registered at the subcentre or PHC level through the Mother and Child Card which was introduced at the study areas, which helped in the better recording of data and monitoring of the study.

The total number of women who were registered at all the centres together were 12,907. During the three years intervention period, the total number of women registered were 2282 in 1988, 5202 in 1989 and 5423 in 1990 at all the centres.

The majority of women who were registered were between 19-28 yr (77%), whereas overall pregnancy in women who

were less than 18 yr of age was 5.8% except 14.2% in Kendur PHC of Pune. On an average, 95% of registered mothers had no history of abortions, 96.7% indicated no history of still births and 90% of them had no history of previous infant deaths. The incidence of primipara registered mothers was 20% and para 4 and above 16.8%. Overall, 69.1% registered mothers had living children and 12.8% had at least four and above living children. The incidence of last birth interval of less than 18 months, one of the high risk factors, was 26.7% indicating the poor usage of spacing methods by these women.

The success of implementation of interventions in the study area were measured by certain process indicators of MCH services such as antenatal registration, tetanus toxoid immunization, contact of registered mothers by the health workers during the pregnancy, the use of safe delivery kits and birth weight recording.

The antenatal registration is an important indicator to show improvement in the quality and coverage of MCH services. During the situation analysis, the antenatal registration varied between 1C 43% in all the centres. However, as a result of interventions, antenatal registrations showed an increasing trend, *i.e.*, it was 41.9% in 1988, 70.7% in 1989 and 77.9% in 1990. Though there were centrewise variations; however, all the centres showed this encouraging trend of coverage by MCH services. Early registration, *i.e.*, less than 19 wk of gestation registration showed an overall increase at all the centres, which also indicates an improvement in the coverage and quality of MCH care. This event was not at all recorded before the interventions were initiated in the study areas.

Home visits of mothers by health functionaries form a crucial factor for improving the health care during pregnancy. It was encouraging to note that 93.3% of the pregnant women had atleast one home visit by the health worker during the intervention period, whereas the number of women who did not receive any such visits decreased from 9.8% to 5.9%. The coverage of pregnant women with IFA tablets and TT immunization showed a marked improvement during the intervention period at almost all centres. The distribution of 61-120 IFA tablets in number increased from 52.6% to 70.5%. Similarly, the coverage by tetanus toxoid immunization increased from 61.3% to 81.8%.

Most of the deliveries in rural India are still being conducted at home. For example, in this study 73.1% of deliveries were conducted at home. However, it was heartening to note that the percentage of deliveries conducted by untrained Dais, by and large, decreased during intervention phase. The only exception was in the PHC of Ahmedabad, where 63.0% of the deliveries were conducted at PHC and 52.5% of deliveries were conducted by ANM/LHV. In contrast, however, in the PHC of Pune, 57.1% of the deliveries were conducted by relatives and the situation did not improve during the intervention phase.

Birth weight recording was non-existent in all the Primary Health Centres before initiation of the study. During the intervention phase, 69.4% of newborns were weighed with the help of the spring balance supplied at the SC/PHC during the preparatory phase. The average birth weight was observed to be 2600 g. However, the percentage of low birth weight babies, *i.e.*, less than 2499 g showed a decreasing trend from 19.7% to 17.9%.

The early identification of mothers and infants having risk factors is an important component of MCH care. The situation analysis showed that the system of identification of risk factors was not at all present and no records were maintained in this regard by the health functionaries, nor any referrals were made for the purpose of better care of the mothers and infants "at risk".

The number of women identified for having either one or more of the risk factors were 4522, about 35% of the total number of pregnant women. It was also observed that the percentage of women in whom at least one or more of the high risk factors were identified was picked up during the intervention phase, though centrewise variations were observed in this regard. The high risk factors to be identified in the mothers and infants were spelled out during the training programme of medical officers/health functionaries. As compared to the women in whom no risk factors were identified, it was observed that the higher incidence of risk factors were identified in those women who were either in age groups of less than 18 yr or over 34 yr or who had either a bad obstetric history or had a birth interval of less than 18 months. The prevalence of some of the risk factors commonly found in pregnant women were as follows—gravidity 5 was present in 15.2%, last birth interval of less than 18 months in 15.2% and previous bad obstetric history was present in 8.6%. Amongst the centres, the prevalence of risk factors varied. For example, the incidence of bad obstetric history and gravidity 5 was found in higher ranges at the PHCs of Uttar Pradesh and Madhya Pradesh. In the PHC of Pune, the prevalence of gravidity one with less than 18 yr of age was as high as 14%.

Amongst the newborns, the prevalence

of some of common risk factors such as birth weight between 2000-2499 g was observed in 12.2% and a gestational age of less than 37 wk in 6.1%. The prevalence of other risk factors were as follows: 1.4% for birth weight of less than 2000 g, 1.1% of babies had respiratory distress, and congenital malformations were present in 0.2% of newborns. It was found that the women in whom one or the other risk factors were present, the pregnancy outcome was adverse as indicated by a higher incidence of low birth weight babies born to these women.

It was encouraging to note that the quality of MCH services provided during the antenatal period to both the categories of pregnant women whether having a risk factor or not was of similar type since one of the major objective of the study was to provide comprehensive MCH care to all pregnant women in the study areas. However, certain indicators of MCH services such as early registration of mothers, *i.e.*, less than 20 wk gestation was observed to be higher in women who had one or the other high risk factors and these women had higher number of antenatal visits by health functionaries. Most importantly, 23.5% of women having high risk factors were examined by the medical officers as compared to 13.7% who did not have risk factors. This data suggests that while no discrimination was practiced by the health functionaries to provide the MCH care to all pregnant women, the intensity and concern for the care of pregnant women having one or the other risk factors were greater.

As regards the adverse outcome of pregnancy, it was seen that percentages of babies having low birth weight, *i.e.*, less than 2499 g were higher—24.7% in women having one or more of the risk factors as

compared to 16.6% in women having no risk factors. Furthermore, the incidence of delivery before 37 weeks of gestation was higher, 21.1% in women having one of the high risk factors as compared to 14.4% in women having no risk factor. It was, however, interesting to note that in the mothers with high risk factors such as birth interval of less than 18 months or gravida more than 5 or having bad obstetric history, the incidence of deliveries conducted by doctors were significantly higher. It was observed that all the high risk factors identified during the antenatal period were significant contributors to the increase in the risks in newborns except gravida one with age more than 30 yr and Hb less than 8 g/dl.

The mechanism of referrals was non-existent during the situation analysis phase at the PHCs of the study areas. During the training of medical officers and paramedicals, the system of referrals, especially the high risk mothers and infants was emphasized such as whom to refer and where to refer. The utilization of referral services were monitored during the intervention period.

It was observed that the total number of women who were referred in all centres taken together was 862, about 6.7% of all pregnant women, whereas in contrast, the incidence of referrals was significantly higher-17.6% in women having one or more of the high risk factors. Furthermore, the utilization of referral services was higher by pregnant women having the high risk factors 52.9% as compared to 45.3% of women having no risk factors. The community considered age as one of the important risk factor, since amongst the gravida one pregnant women having the ages of either

less than 18 yr or more than 30 yr, a significantly higher proportion availed referrals, being 64.6% and 50.0%, respectively. Similarly, in pregnant women having clinically apparent symptoms of edema or eclampsia or convulsions, the utilization of referral services was also significantly higher 66.7%. It was important to note that a majority of (74.5%) referrals were to the subcentre level. This observation indicates that the subcentre, being the first level of contact of the pregnant women in the primary health care delivery system, should be strengthened with requisite manpower and infrastructural facilities to improve the quality and coverage of MCH Services.

Amongst those pregnant women who availed the referral services, the outcome of pregnancy was better as compared to those women who did not. For example, the prevalence of low birth weight was 26.2% in those women who had availed the referral services, as compared to those pregnant women who did not, where the incidence was significantly higher being 35.4%. Though establishing a referral mechanism within the existing health delivery system is a difficult task; however, the benefits of referrals as regards to the pregnancy outcome, as supported by the data from the present study, strongly indicate that all efforts should be made to achieve this important goal in order to improve the quality of MCH care.

In summary, results of this study indicate that it is possible to improve the quality and coverage of the MCH care at the PHC level within the existing norms of the primary health care delivery system, using the comprehensive MCH care package along with high risk approach strategy.