Original Article

Maternal and Community failures in Newborn Care and High rural Neonatal mortality

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Abstract:
Background: The neonatal mortality rate (NNMR) is more in rural India (54.3 in males; 49.0 in females) than in urban India (37.8 in males; 28.8 in females).
Objectives: To what extent the rural mothers and the communities are responsible for this situation?
Methods: A cross-sectional community based comparative study in urban and rural settings .Statistical techniques: Cluster sampling; proportions; Chi-square tests. Method: Three hundred mothers (150 urban and 150 rural) were surveyed regarding 40 selected newborn care (NBC) practices by a pediatrician and three resident doctors using a predesigned questionnaire.
Results: Rural mothers were falling behind urban mothers in 25 out of 40 selected NBC practices. The major lapses with rural mothers were with regard to Early initiation of breast feeding, Exclusive breast feeding practice (Urban 52% Rural 15% P<0.0000), Colostrums feeding (Urban 79% Rural 7% P<0.0000), Poor drying and wrapping the child (Urban 90% Rural 48% P<0.00000), poor thermal protection (Urban 81% Rural 31% P<0.00000), mother- child skin contact (P<0.00001), poor cord care (P<0.00000), inappropriate treatment when child is sick (Urban (7 % Rural 23% P<0.00000), delay in seeking medical help (P<0.00000). Community level failures were: Preferring home deliveries (P<0.000084), Delivery by untrained Dai (P<0.0110), lack of early new born checkups (Urban 42% Rural 15% P<0.00000), less affordability of treatment (P<0.000005), and poor community awareness about NBC (P<0.00001) etc.
Conclusion: Rural mothers new borne care practices were deficient in most of the aspects in this study.
Key words: Newborn care practices, maternal failures, Community level failures

Introduction:
One in every three neonatal deaths in the world is in India i.e. 30% of the 3.9 million global neonatal deaths. That is, each year 1.2 million children are dying during first month out of 26 million born. [1, 2] Neonatal mortality rate (NNMR) in India is about 44/1000 live births, almost 65% of infant mortality rate. [3] Its major causes are sepsis, prematurity, low birth weight, poor natal care and poor new born care. [4] Neonatal mortality rate has become static at 44/1000 live births in recent years and interstate, inter district and urban- rural disparities still exist in the country. [1, 2] The neonatal mortality rates are more in rural India than in urban India. [1] This situation is present in spite of provision of Emergency new born care services and other interventions under Reproductive and Child Health Programme during 10th and 11th Five year plans. [3] The present study explores the rural situation responsible for the high rural neonatal mortality rate by studying the maternal and community level failures in Newborn care.

Methodology:
After obtaining ethical committee permission, the study was commenced. About 150 urban mothers from two urban clusters of Bhaghatnagar, Kattarampur wards of Karimnagar city and 150 rural mothers from Vutoor and Pachunur villages (two rural clusters) of Karimnagar district who have delivered in previous year were selected for the study by cluster sampling method. Barnett S et al in Bangladesh selected similar group of women for the NBC study. [5] Door to door survey was conducted by three resident doctors lead by pediatrician using a predesigned questionnaire. About 40 aspects of newborn care (NBC) were studied among urban and rural mothers. Bathing practices (hot water, cold water,

daily or periodically), Skin cleansing with soaps and oil applications, Thermal control by drying and wrapping the child after bath with towels and habit of maintaining mother -child skin contact were studied. Delivery practices using clean under surface for delivery ,Clean hands, Clean cord cutting , and clean cord cut, clean cord tie , putting eye drops after delivery, looking for Jaundice were studied. Infant feeding practices like breast feeding initiation within first hour and its continuation, Exclusive breast feeding practice, Feeding of colostrums, pre-lacteal feeding and washing of mothers hand prior to feeding and after diaper change were enquired. History about taking three antenatal checkups, birth spacing, Sources, availability and utilization of immunization services, malnourishment, anemia, age at marriage of mother was obtained. Mothers knowledge about danger signs of newborn problems, Mothers attitude regarding NBC ,Mothers concerns about NBC, Illiteracy of mother , Mothers physical health ,Number of children, Sex of the child ,Birth order of child, Late recognition of co morbidities by mother, Inappropriate treatment when child is sick ,Delay in seeking medical help for child were recorded. Community awareness and involvement about NBC, Grandmothers superstitions and Cultural practices in the community regarding diet, exercise, infant feeding were enquired. Preference for home deliveries, Delivery by trained Dai, Poor living conditions of the families and poverty were obtained. Lastly availability of health facilities , affordability of treatment, Health worker role, practice of new born checkups within 24 hours, postnatal visits by health workers were also enquired.

Results:

Study Population consists of 300 Mothers: 150 urban and 150 rural mothers (50% each). Mean age of mothers is 15-34 years, Poor mothers (76%) Rich mothers (24%) Primipara (26%) Rural mothers were failing in 25 out of 40 selected NBC practices when compared with urban mothers. They were:-

A) Infant feeding practices: Early initiation of breast feeding (Urban 72% Rural 23% P<0.00001), Exclusive breast feeding practice (Urban 52% Rural 15% P<0.0000), Colostrums feeding (Urban 79% Rural 7% P<0.0000), Pre-lacteal feeding (Urban 87% Rural 12%) P<0.00000), Hand washing before feeding the child (Urban 81% Rural 44% P<0.00001) (Table 1)

B) Maternal factors: - Poor knowledge about danger signs of newborn diseases (Urban 45% Rural 21% P<0.000011), Mothers illiteracy (Urban 27% Rural 57% P<0.000001) Large family size (Urban 27% Rural 57% P<0.000001) and Late recognition of co- morbidities (Urban 15% Rural 41% P<0.0000). (Table 2)

C) Child rearing practices:- Poor drying and wrapping (Urban 90% Rural 48% P<0.00000), poor thermal protection (Urban 81% Rural 31% P<0.00000), mother- child contact (Urban 75% Rural 28% P<0.00001), poor cord care (Urban 88% Rural 43% P<0.00000), inappropriate treatment when child is sick (Urban 7 % Rural 23% P<0.00000), delay in seeking medical help (Urban 5 % Rural 60% P<0.00000) , awareness about sources of immunization and availability(Urban 59 % Rural 38% P<0.0003415) and high birth order of the child (urban 15% rural 51%; p = 0.00000),. (Table. 3)

D) Community level practices:-Preferring home deliveries (Urban 36% Rural 59% P<0.000084), Delivery by untrained Dai (Urban 44% Rural 59% P<0.0110), early new born checkups (Urban 42% Rural 15% P<0.00000), postnatal visits by health worker (Urban 44% Rural 23% P<0.00000), less affordability of treatment (Urban 35% Rural 67% P<0.000005), , Negative role of grandmothers (Urban 37% Rural 63% P<0.0000039) , male child preference (Urban 32% Rural 57% P<0.000001) and poor community awareness about NBC (Urban 57% Rural 15% P<0.00001). (Table .4)

E) No significant urban rural differences were observed with regard to the other 15 practices like Eye care, Skin cleansing, observing short pregnancy intervals, positive attitude regarding NBC, Sickness of mothers, 3 antenatal visits, Malnourished anemic mothers, Early marriage of mothers, Availability of health care, Health worker role, Dropout rates for child immunization, jaundice care, mothers concerns about NBC, Knowledge about prevention of diarrheas and pneumonias and low birth weight care, cultural practices in community and Poverty of the families. (Tables 1-4)

Discussion:

The study revealed that the rural mothers are deficient in most of the newborn care skills i.e. 25 out of 40 selected skills than the urban mothers. These disparities are not just unique to urban and rural areas but present at district and state levels also. Health Survey (NFHS 2),[3] its review study by Siddarth Ramji [1] and Report on “State of Indias Newborns” by WHO/ UNICEF/Government India[2] endorsed the same trend in health gap.

Maternal failures: Healthy mother brings about a healthy baby otherwise she may give rise to a Low Birth Weight baby (LBW). LBW is one of the principal causes of neonatal deaths. Poor spacing, poor antenatal care, anemia and ill health were all observed among rural mothers but not significant. Studies in India by Ramji S [1] and Sachs B in USA [6] correlated ill health of the mother with the lapses in newborn care. Bharghava SK in his study observed association of anemia of the mothers with poor perinatal outcomes. [7] Even parental abuse of children by sick mothers, particularly when the child is LBW is seen in study by Sachs B [8] but not in this study. Mothers observing birth -spacing are less (41%) in this study and not significantly associated with poor new born care whereas both are related in the study by Bharghava SK and colleagues. [7]

Unsafe delivery practice: It is about 59% in this study and by untrained dais. Preference for unsafe home deliveries by mothers, poor awareness of mothers about 5 cleans of safe delivery, (clean undersurface for delivery, clean cord cut, clean cord tie, clean hands during delivery and non application of harmful substances on the cord) are the major inadequacies in this study. Barnett S et al also found only 54% of mothers are having safe deliveries in Bangladesh. [5] These unsafe deliveries may result in sepsis and neonatal tetanus and high rural NNMR. [4]

Child rearing practices: South Indian rural mothers in this study are not able to protect their children from hypothermia. Only half of them are drying their children properly after bath, one third of them are wrapping properly and just one

fourth of them are keeping the child in close contact with their body. They are exposing the neonates to climate more than urban mothers. They are unable to keep their children in close contact with their body as they are returning to work early to earn their livelihood. The situation is same in north India also. Darmstadt et al [9] found only 49% of north Indian mothers are able to protect their children from hypothermia while Baqui AH et al also noticed poor thermal protection in the same region of India. [10] Mullany LC et al in their Nepal study [11] found bathing can cause a drop of childs temperature by 0.40^0 C and inadequate wrapping of child by the mothers can cause hypothermia. Syed U intervention study also observed only 14% of mothers are properly drying and wrapping their children. [12] It appears to be true here in this study also (practiced only by 48% of rural mothers). Cord care is deficient with rural mothers in this study. This may be due to poor antenatal advice and lack of skilled attendance at delivery and illiteracy of mothers as seen with Baqui AH et al study where antenatal care and skilled assistance are directly proportional with cord care and breast feeding practices. [10] Only 37% are having positive attitude and concerned with cord care in this study. Mothers are usually concerned with cord bleeding and cord odor just as stated in Ford LA study. [13]

Infant feeding practices: Feeding problems are also one of the causes of high neonatal mortality rate as shown by Abhay T Bang and his colleagues in an Indian study. [14] All the selected infant feeding practices are significantly deficient with rural mothers in this study. Breast feeding initiation is delayed just like Syed U intervention study, wherein, early initiation is just 38% before intervention. [12] Low exclusive type of breast feeding practice, high colostrums rejection habit, poor hand washing habit before feeding and after changing diapers are observed . Similar lapses regarding breast feeding are seen with other studies. Barton SJ study showed that only 41% of mothers are breast feeding. [15] Kameswararao AA study revealed very low practice of exclusive breast feeding habit (39.5%). [16] Colostrum feeding is poor (6.6%) with rural mothers among these mothers while it is 42% by Barnett S and his colleagues Bangladesh. [15] Baqui AH et al concluded that breast feeding practice is directly related to the antenatal care and skilled attendance at delivery. [10] But Darmstadt et al found adequate breast feeding behavior in his study. [17] Hand washing habit is poor in this study. Situation is similar with Darmstadt et al Egyptian study wherein nearly 43% of mothers did not wash their hands before neonatal care and only 7 % washed their hands after diaper changes. [17] Early introduction of inappropriate solid foods on compulsion by grandmothers is seen in this study as seen in Barton SJ study. [15] It should be discouraged. Most importantly, only 20% of the rural mothers are having knowledge about danger signs in newborn care and about 48% know about prevention of diarrheas and pneumonias. Syed U in his study also found that only 14% of mothers are aware of danger signs of new born care. [12] Hence, they are recognizing the sickness in their children very late (41% mothers). That is the reason why they are delaying the treatment for their children when sick (59% mothers) and giving wrong treatment (59% mothers). These causes, late recognition of co-morbidities, delayed treatment, wrong treatment were noticed by Armida Fernandez in another Indian study. [4] Child immunization was not much affected in villages in this study though the mother literacy among rural mothers is less. This is in contradiction to the finding by Dhadwal D in his study where the female literacy is directly related full immunization. [18]

Community failures: Last but not least, the rural community is lacking the knowledge of proper new born care and hence encouraging harmful practices causing high rural neonatal mortality rate. As its NBC awareness is poor, it prefers unsafe home deliveries as seen in this study and by other Indian study by Armida Fernandez. [4] Probably non affordability of costly institutional delivery may be a reason was also seen in the Armida study. [4] The situation is similar in our sub continent as in neighboring Bangladesh also, 90% are home deliveries as seen in a study by Barnett S et al.[5] Lack of postnatal checkups of newborns within first 24 hours is very common in our villages as seen in this study and Syed U study supports the same fact. [12] Lastly the poverty, unhygienic living conditions, son preference, lack of health facilities are also adding the fuel to the fire and causing high rural neonatal mortality rate. This study objective is an important public health problem in our country and this type of studies will be very useful for policy making while planning for improving child survival programmes. To conclude**,** the rural mothers are less skilled than the urban mothers in managing their newborn babies. Their knowledge, attitudes and practices are poor with regard to infant feeding and child rearing in particular. The rural community also is less aware about NBC and perpetuating the problem of neonatal mortality by its harmful traditions, beliefs, preferences and practices. Special vertical NBC projects with specifically trained health staff to improve the rural new born care have to be launched till the NNMR comes down at least to 10/1000 from the present 44/1000 live births. It is worth investing to save our little gods

Conclusion:

Rural mothers new borne care practices were deficient in most of the aspects in this study. This was the cause of most probable cause of high neonatal mortality in rural communities.

Recommendations: The rural mothers should be educated about the correct new born care practices .The whole community, the health workers, mother leaders and teachers must be sensitized about the importance of NBC to elicit their support. Traditional birth attendants should be given refresher trainings in safe delivery practices repeatedly.

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Table 1: Infant feeding practices by Urban and Rural mothers

Study variable	Urban positive (%)	Urban negative (%)	Rural positive (%)	Rural negative (%)	Chi square	P value
Breast feeding within first hour	72	28	23.3	76.6	71.21	0.0000
Exclusive breast feeding	52	48	14.6	85.3	47.04	0.0000
Colostrums feeding	78.6	21.3	6.6	93.3	158.94	0.0000
Pre-lacteal feeding	86.6	13.3	12	88	167.28	0.0000
Hand washing before feeding	81.3	18.6	44	56	44.68	0.0000

Table 2: Urban- Rural differences in maternal factors

Study variable	Urban positive (%)	Urban negative (%)	Rural positive (%)	Rural negative (%)	Chi square	P value
Knowledge about low birth weight management	45.3	54.6	36.6	63.3	2.33	0.127
Mothers who had 3 antenatal visits	73.3	26.6	63.3	36.7	1.05	0.305
Early marriage of mother	34.6	58.6	48	52	3.41	0.0618
Having knowledge about danger signs	44.6	55.3	20.6	79.3	19.32	0.0000
Positive attitude about NBC	45.30	54.6	36.6	63.3	2.33	0.127
Illiterate mothers	27.3	72.7	57.3	42.6	27.65	0.000
Observing short pregnancy intervals	36.6	63.3	41.3	58.6	0.69	0.407
Ill health of mother	44.6	58.3	43.3	56.6	0.05	0.816
Mothers with more children	27.3	72.6	57.3	42.6	27.65	0.000
Mothers who recognized co-morbidities very late	14.6	85.3	41.3	58.6	26.46	0.000
Knowledge about Prevention of diarrheas and pneumonias	44.7	55.3	52.6	47.3	1.92	0.165

Table 3: Urban –Rural differences of Child rearing by mothers

Study variable	Urban positive (%)	Urban negative (%)	Rural positive (%)	Rural negative (%)	Chi square	P value
Drying and wrapping	90	10	48	52	61.85	0.000
Skin cleansing	44.6	55.3	36.6	63.3	1.99	0.1584
Thermal control	81.3	18.6	31.3	68.7	76.22	0.0000
Mother child skin contact	74.6	25.3	28	72	65.38	0.0000
Child care: 5 cleans	88	12	42.6	57.3	68.35	0.0000
Eye care	38.6	61.3	44	56	0.88	0.3842
Jaundice care	36.6	63.3	41.3	58.6	0.69	0.407

Table 4: Showing the Community level factors for high Neonatal mortality

Study variable	Urban positive (%)	Urban negative (%)	Rural positive (%)	Rural negative (%)	Chi square	P value
Community awareness about NBC	57.3	42.6	14.6	85.3	52.96	0.0000
Preference for home deliveries	36	64	59	41	15.46	0.0000
Delivery by untrained Dai	44	56	58.6	41.3	6.06	0.011
Postnatal visits by health worker	44	56	23.3	76.6	14.34	0.0000
Poor hygienic living conditions	14.6	85.3	72.6	27.3	102.57	0.0000
Poverty of the families	44.7	55.3	52.6	47.3	1.92	0.165
Superstitions, Cultural practices in community	44	56	54.6	45.3	1.92	0.646

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