A community based study of Infant Mortality in rural Aligarh

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RESEARCH

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Abstract

Background

Infant mortality rate is regarded as an important and sensitive indicator of the health status of a community. It also reflects the living standard of the people and the effectiveness of interventions for improving maternal and child health. Multiple factors related to social and economic conditions, health care and environment have a significant role to play on childhood mortality and improving childhood mortality is a national priority. The present study was planned to 1) determine the mortality rate among neonates and infants. 2) identification of pattern of various factors in relation to infant mortality and 3) to identify the causes of death in this age group.

Method

All the deaths in children under 12 months during July 2005 to June 2006 in Jawan block of district Aligarh, India were recorded. The cause of death was ascertained using the standard verbal autopsy procedure.

Results

In the study period, 446 live births and 37 deaths in children under one year of age were reported. The neonatal and infant mortality rates were 49.4 and 83.0 per thousand live births respectively. The main causes of infant deaths were birth asphyxia, diarrhoea, pneumonia, prematurity (including Low birth weight and malnutrition).

Conclusion

Most of the death among infants are preventable, though promotion of institutional deliveries, strengthening of referral system, early recognition of danger signs and periodic retraining of health workers.

Background

Of the estimated 130 million infants born each year worldwide (1), 4 million die in the first 28 days of life. Three-quarters of neonatal deaths occur in the first week of life, with more than one-quarter of these deaths occurring within 24 hours of the birth (1, 2). Neonatal deaths account for 40% of deaths under the age of 5 years worldwide. IMR is regarded as an important and sensitive indicator of the health status of a community. It also reflects the living standard of the people and the effectiveness of interventions for improving maternal and child health. Multiple factors related to social and economic conditions, health care and environment have a significant role to play on childhood mortality and improving childhood mortality is a national priority in India. Infant mortality rates vary from state to state across the country, as the efforts and consistency towards child survival varies. The neonatal and infant mortality rates for Uttar Pradesh as tabled in National Family Health Survey-3 (2005-06) are 47.6, 72.7 and per 1000 live births respectively [3]. In order to ascertain the infant mortality rate of the study area and identification of pattern of mothers' age at delivery, birth order and birth interval in relation to infant mortality and the causes of deaths in the same age group, the present study was undertaken.

Methods

The study was undertaken for a period of one year (i.e. July 2005 to June 2006) in rural field practice areas of Jawan block under the Department of Community Medicine, Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh, India. The study was conducted in 7 villages of Jawan Block, having a total population of 14,594 residing in 1650 households. The centre is situated at Jawan, which is a block head quarter village and lies 17 Kms from the Medical College on the Aligarh Anoopshehar Highway.

Before the study commenced there was advanced information and education communication (IEC) activities in the study area, about the nature, purpose of the study. The pradhan of the village, auxiliary nurse midwife, untrained Dais, trained Dais and anganwadi workers (AWW) operating in the study areas were taken into confidence before

starting the study and their cooperation sought. The Dais, community leaders, the workers of the study areas and sometimes the mothers themselves reported the birth to the interviewer. Similarly information about death was collected by the dais, community leaders, health workers and often the mothers or the relatives. House to house visit was undertaken. The visits were so arranged that each study area was visited for 4 days in a month. The remaining days in each month were used to revisit houses which could not be contacted on regular days.

All the live births and the deaths of children under one year of age were recorded during the study period. A detailed history of the events of birth of the baby and the circumstances leading to death were elicited from the respondent. The age of the deceased child was ascertained by the exact date of birth if the parents could recall or by the religious and the ritual events. Before the investigation into the cause of death commenced, consent of the mother or guardian was taken. The stillbirths were excluded from the study as the infant mortality is calculated by taking babies dying immediately after birth and till one year of age. Moreover still births are basically dead born babies and are not taken into account while discussing infant mortality. This is followed globally. The cause of death was ascertained using standard verbal autopsy procedure. In case of doubt, the cause of death was ascertained after discussion with the consultants of Departments of Community Medicine and of Paediatrics. The study was discussed by the board of studies of the Department of Community Medicine Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh, India and was granted permission.

the following terminology was used in this study: Infant Mortality Rate: number of deaths, under one year of age per thousand live births in the study area; Neonatal Mortality Rate: number of neonatal deaths under 28 days of age per thousand live births in the study period; Post -neonatal Mortality Rate: number of infants deaths between 28 days to 1 year of age per thousand live births in the study year; and Verbal autopsy: a method of finding out the causes of a death based on interview with the next of kin or other care givers [4].

Table 1. Distribution of mortality in infants
 *Calculated as per 1000 live births

Age at death	Deaths		Mortality Rate *
	No.	%	
0– 28days	22	59.46%	49.32
29dys-1yr	15	40.54	33.63
Total (0-1yr)	37	100.00	82.95

Results

During the study period, 446 live births and 37 deaths among infants were observed. Of the infant deaths, about 60% (22) were in the neonatal period whereas 40% (15) died in the post-neonatal age group. The neonatal posts neonatal and infant were 49.4, 33.6 and 83.0 per thousand live births respectively (Table 1). There were more female deaths in the neonatal and post- neonatal agegroups.

The IMR was higher in young mothers (15-20years) and in those aged 35 years and above. Out of 37 deaths, the IMR was highest in the age group 15-20 years (117.51 per 1000 live births. (Table 2)

Table 2: IMR in relation to mother's age at delivery

Mother's age (yrs)	Total births	Total deaths	Infant mortality rate*
15-20	51	6	117.51
20-25	164	11	67.07
25-30	136	12	88.20
30-35	56	4	71.4
35+	39	4	102.56
Total	446	37	82.96

*Calculated as per 1000 live births

Figure 1 shows that the infant mortality rate was high in first order birth and in the birth order fourth and above. U-Shaped pattern could be seen in infant mortality in relation to birth border. When the pattern of infant mortality rate was seen with the birth interval between the deceased child and its sibling, it was found to have a reciprocal effect (Figure 2).

Figure 1
Infant mortality rate in relation to birth order
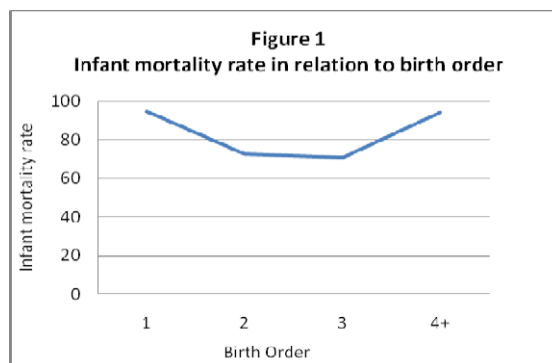
The major causes of deaths during the neonatal period (Figure 3) were birth asphyxia (40.9%), prematurity (including low birth weight) (27.27%). Pneumonia, diarrhoea, tetanus, neonatal sepsis, neonatal jaundice and congenital malformation were the other causes of deaths (4.55% each).In the post-neonatal period, the main causes of mortality were diarrhoea and pneumonia (80%) (Figure 4).
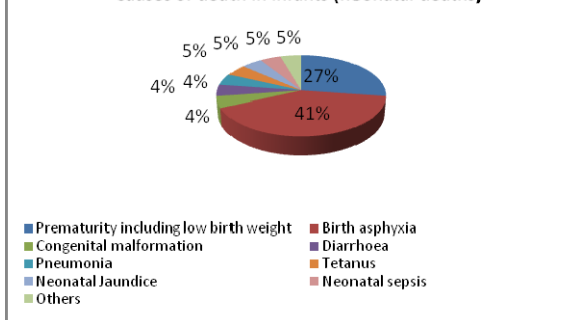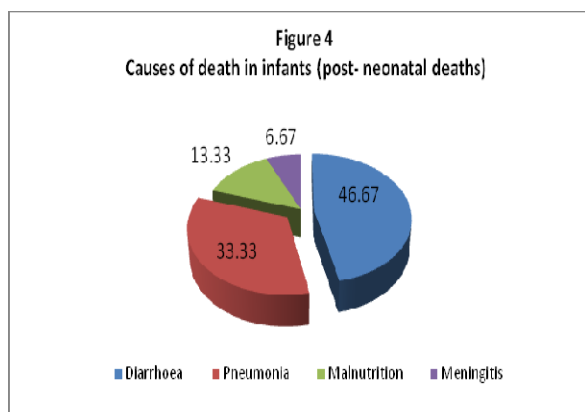
Figure 3
Causes of death in infants (neonatal deaths)

Figure 4
Causes of death in infants (post- neonatal deaths)

Discussion

The study is an attempt to find out the mortality rates in children under-five years of age as well as the causes of death by means of verbal autopsy. The diagnosis was mainly symptom based as per the information collected by verbal autopsy. The neonatal and infant mortality rates for Uttar Pradesh as tabled in National Family Health Survey-(2005-2006), India were 47.6 and 72.7 per 1000 live births respectively [3]. Nandan [5] found the neonatal and infant mortality rates as 39.4 and 73.5 per 1000 live births respectively. Another study on the Aligarh population found the infant mortality rate was 79.3 per thousand live births [6]. During the present study, the neonatal and infant mortality rates were observed as 49.4 and 83 per thousand live births respectively, which is higher when compared to the values reported previously [5,6]. These findings emphasize the need for upgrading delivery skills and strengthening of the institutional procedures and essential newborn care.

It was seen in the present study that IMR was higher in young mothers (15-20 years) and in those aged 35 years and above. It shows that the infant is at risk of dying more if the age of mother at delivery is on either extremes .Similar findings were observed in studies conducted by other authors [9-11]

Infant mortality rate was high among 1st and 4th order births compared to the middle orders. The other authors were of similar views in their respective studies [10-12].
The infant mortality rate was inversely proportional to the interval between the deceased child and their sibling/s and

thus pointing towards advocacy for a two year gap between pregnancies. The gap would allow the mother to replenish her stores exhausted in the previous pregnancy. Moreover the child would enjoy the full support and care by the mother until infancy is reached [11-13].

Our data show that the major causes of deaths during the neonatal period were birth asphyxia, prematurity (including LBW), pneumonia, diarrhoea, tetanus, neonatal sepsis, neonatal jaundice and congenital malformation. Nongkynrih [7] in a study on the use of verbal autopsy by health workers in children under 5 years found birth asphyxia, prematurity, low birth weight and septicemia as the main causes of death in the neonatal period. Vaid et al [8] also reported that the neonatal deaths were mainly due to perinatal asphyxia, prematurity, aspiration pneumonia or acute respiratory distress. Our findings on the causes of neonatal deaths are in agreement with report by others [5-7]. In the surveyed population of Aligarh, we found a single case of tetanus. This may be due to increased awareness and improved coverage of tetanus immunization among pregnant women.

In our study, we observed the main causes of death were diarrhoea, pneumonia and malnutrition in the post-neonatal period. Similar observation were made previously [5] and reported diarrhoea, pneumonia and severe malnutrition as the major causes during post- neonatal period. Our study is also consistent with earlier findings where diarrhoea, pneumonia and malnutrition were determined as the main causes of death in the post neonatal period [6].

Limitations

The verbal autopsy procedure is to be administered on either the mother or the relatives of the deceased. Full information might not be gathered if the interviewer goes at the house immediately after birth because of an environment of sorrow and grief. If one interviews too late, then there appears difficulty in recalling the events on part of mother. The exact timing of interviewing often becomes a difficult task.

Conclusions

The study concludes that the neonatal and infant mortality rates determined here are higher as compared to those recorded earlier for Uttar Pradesh. The burden of mortality among infants can be reduced by strengthening of Reproductive and child health programme, promotion of institutional deliveries, strengthening of referral system, early recognition of danger signs by health workers through training, health education regarding promotion of at least 2 years between pregnancies and improving the literacy status of the community as a long term goal.

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