Curr Pediat Res 2010; 14 (1): 51-53

Verbal autopsy to determine causes of deaths among under-five children.

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Abstract

Objective: Identification of causes of death by verbal autopsy which can be conveniently used by peripheral health workers. Methods: All the deaths in children under the age of five years in one year study period were recorded. The cause of death was ascertained using the standard verbal autopsy procedure. Results: In the study period, 446 live births and 56 deaths in under-five children were reported. The neonatal, infant and under five mortality rates were 49.4, 83.0, 125.6 per thousand live births respectively. The main causes of infant deaths were birth asphyxia, diarrhoea, pneumonia, prematurity (including LBW) and malnutrition. The deaths in children of 1-5 years age group were mainly due to diarrhoea, malnutrition, pneumonia and meningitis. Conclusion: Most of the death in children under the age of five years is preventable, if issues like promotion of institutional deliveries, strengthening of referral system, early recognition of danger signs, strengthening of RCH program.

Key words: Verbal autopsy; Infant mortality; Under-five mortality

Accepted August 17 2009

Introduction

Verbal autopsy is a method of finding out the causes of a death based on interview with next of kin or other care givers [1]. Verbal autopsies have been validated and used for ascertaining the cause of death in many countries. When the list of target disease is extensive, questionnaire-based verbal autopsies may, in principle, ensure high specificity. They can be administered by lay people. [2]. In 1992, recognizing the need for uniform and valid criteria for diagnosing common causes of death, Bang et al proposed a set of criteria for the cause of death among neonates and those aged 1-59 months [3]. This tool has high sensitivity and specificity in both neonatal and post neonatal deaths [3].

Under-five mortality is an important indicator of the quality of health care. Data on childhood mortality is collected by various methods which are not uniform throughout India. Large number of childhood deaths goes unreported and even misclassified at later stage of identification. As most of the deaths in the rural areas occur at home and a medical certification by a qualified practitioner is not possible, there is a need for using some simpler methods like verbal autopsy which can be used even by lay people. In order to ascertain the causes of deaths in under-five children by using the standard verbal autopsy procedure, a population based study was undertaken to estimate the mortality rate and ascertain the causes of deaths in under-five children.

Methodology

The study was undertaken for a period of one year (i.e. July 2005 to June 2006) in rural field practice areas of Department of Community Medicine, JNMC, AMU, Aligarh. The study was conducted in 7 villages of Jawan Block, covering 2160 children under-five years of age residing in 1650 households.

All the live births and the deaths in under-five children 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. After six months of study, the mid-year population in the study area was enumerated by door to door survey. Before the investigation into the cause of death, the consent of the mother or guardian was taken. The stillbirths were excluded from the study.

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.

Results

During the study period, 446 live births and 56 deaths in under-five children were reported with 66% (37) of deaths among infants. Of the infant deaths, about 60% (22) were in the neonatal period whereas 40% (15) died in the post-neonatal age group. The neonatal, infant and under-five mortality rates were 49.4, 83.0, 125.6 per thousand live births respectively (Table-I). There were more female deaths in the neonatal and post- neonatal age groups.

The major causes of deaths during the neonatal period (Table-II) were birth asphyxia (40.9%), prematurity (including LBW) (27.27%). Pneumonia, diarrhoea, tetanus, neonatal sepsis, neonatal jaundice and congenital malformation were the other causes of neonatal deaths (4.55% each). In the post-neonatal period, the main causes of mortality were diarrhoea and pneumonia (80%) (Table-III).

Table I. Distribution of mortality in under-five children according to age

Age at death (years)	**Deaths** No.	**Deaths** %	**Mortality Rate**
0 – 1	37	66.07	82.96*
1 – 2	6	10.71	13.89
2 – 3	5	8.93	12.82
3 – 4	5	8.93	10.44
4 – 5	3	5.36	8.04
Total (0-5)	56	100.00	125.60*

**Calculated as per 1000 live births*

Table II. Causes of death in Infants (neonatal deaths)

Causes of death	Neonatal deaths No.	Neonatal deaths %
Prematurity (including LBW)	6	27.27
Birth asphyxia	9	40.90
Congenital malformation	1	4.55
Diarrhoea	1	4.55
Pneumonia	1	4.55
Tetanus	1	4.55
Neonatal jaundice	1	4.55
Neonatal sepsis	1	4.55
Others	1	4.55
Total	22	100

Table III. Causes of deaths in Infants (post- neonatal deaths)

Causes of death	Post- neonatal deaths No.	Post- neonatal deaths %
Diarrhoea	7	46.67
Pneumonia	5	33.33
Malnutrition	2	13.33
Meningitis	1	6.67
Total	15	100.00

Table IV. Causes of deaths in children (1-5 years)

Causes of death	No	%
Diarrhoea	7	36.8
Pneumonia	2	10.5
Malnutrition	5	26.3
Measles	1	5.3
Meningitis	2	10.5
Accidental drowning	1	5.3
Transport accidents	1	5.3
Total	19	100

The major causes of death in children in the age group of 1-5 years were diarrhoea (36.8%), malnutrition (26.3%), pneumonia (10.5%) and meningitis (10.5%) (Table-IV). The five causes of mortality among children in under-five years of age were pneumonia (32.14%), diarrhoea (26.79%), birth asphyxia (16.07%), malnutrition (12.50%) and prematurity (10.71%). These five causes accounted for 78.49% of mortality in children.

Discussion

This study is a successful 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, infant and under-five mortality rates for Uttar Pradesh as tabled in NFHS-3 are 47.6, 72.7 and 96.4 per 1000 live births respectively [3]. Nandan [6] found the neonatal infant and under-five mortality rates as 39.4, 73.5 and 85 per 1000 live births respectively. Another study on Aligarh population demonstrate infant mortality rate up to 79.3 per thousand live births [7]. During the present study, the neonatal, infant and under-five mortality rates were observed 49.42, 82.96 and 125.60 per thousand

live births respectively, which is higher as compared to the values reported previously [6,7].

Our data shows 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 et. al. [8] in a study on the use of verbal autopsy by health workers in under-five children found birth asphyxia, prematurity, low birth weight and septicemia as the main cause of death in the neonatal period. Vaid et. al. [9] also reported that the neonatal deaths were mainly due to perinatal asphyxia, prematurity and aspiration pneumonia or acute respiratory distress. Our findings on the cause of neonatal deaths are in agreement with these reports and others [6-9]. In the surveyed population of Aligarh, we found a single case that died of tetanus. This may be 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 observations were made previously [6] and report diarrhoea, pneumonia and severe malnutrition as the major causes during post-neonatal period. Our study is also in conformity with an earlier report where diarrhoea, pneumonia and malnutrition were determined as the main causes of death in the post-neonatal period [7].

Conclusions

The study concludes that the neonatal, infant and under-five mortality rates determined here are higher as compared to those recorded earlier for Uttar Pradesh. The main causes of under-five deaths are preventable to a larger extent. The burden of mortality among un der five children can be reduced by strengthening of RCH programme, promotion of institutional deliveries, strengthening of referral system and early recognition of danger signs by health workers through training.

Acknowledgements

We are thankful to Drs. M. Athar Ansari, Iqbal M. Khan, Anees Ahmad, Inaam-ul Haq and (Ms) Fatima Khan for extending their support and cooperation during the progress of the work.

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