

## *Infant Mortality at Usmanu Danfodiyo University Teaching Hospital, Sokoto*

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### Summary

**Ibrahim I, Udomah MG and Abdulwahab I. Infant Mortality at Usmanu Danfodiyo University Teaching Hospital, Sokoto.** *Nigerian Journal of Paediatrics* 1993; 20:17. Eleven thousand, three hundred and eighty-four infants were admitted into the Usmanu Danfodiyo University Teaching Hospital, Sokoto, over a three-year period, 1984 - 1986. Of these children, 818 died, a mortality rate of seven percent; 68 percent of all the deaths occurred in neonates. The main causes of death among these neonates were prematurity and associated respiratory problems, septicaemia and birth trauma. In the post-neonatal period, the main causes of death included gastroenteritis, lower respiratory tract infection, septicaemia and anaemia. Many of the causes of death were preventable and this fact stresses the need to improve the provision of primary health care services to pregnant women and newborn babies.

### Introduction

INFANT mortality rate (IMR) has been used as one of the basic indicators of the health and socio-economic status of any country.<sup>1</sup> While this rate has been reduced to the barest minimum in developed countries,<sup>2</sup> it is still alarmingly high in most developing countries.<sup>1</sup> Reports of childhood mortality in hospitals have been published from the southern and middle parts of Nigeria.<sup>2-4</sup> These reports, though based

on hospital records, were reflections of what probably obtained in the respective communities. The present paper describes the pattern of infant mortality in an under-staffed and under-equipped teaching hospital in Sokoto, north western part of Nigeria.

### Patients and Methods

The records of all infants admitted to the Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto, between January 1984 and December 1986, were obtained from the medical records department. The hospital did not operate a referral system, nor did it charge fees during the period of the study. The department of Paediatrics has a separate Children's emergency Unit, a ward and neonatal unit. There are no facilities for intensive care, or ventilation. It is the only paediatric unit in Sokoto State; it

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serves both as a primary and tertiary paediatric centre. The population of Sokoto is mainly rural, with subsistence farming as the major occupation. There is a high illiteracy rate. Adverse cultural practices in the population include early marriage and the practice of *pardah*.

The following information was extracted from the case notes: age, sex and cause(s) of death. The cause of death was determined from the recorded clinical observations, supported by laboratory and radiological investigations, where available. Post-mortem examinations were not performed on any of the deaths. Chi square test was used for determining the significance of differences.

### Results

During the three-year period (January, 1984 - December, 1986) under review, 11384 infants were admitted, of whom 818 (seven percent) died. Data for each year by sex and age range, are presented in Table 1. There were 5837 male and 5547 female admissions, with respective mortality of 429 males and 389 females; this difference in mortality rates was not significant ( $\chi^2 = 0.484$ ;  $p > 0.05$ ). Over the three-year period, the number of children admitted fell from

TABLE 1  
*Year, Age, Sex and Infant Mortality.*

Year	Sex	No of Infants	No of Deaths	
			Neonates	2-12 months
1984	M	2230	78	58
	F	2220	96	48
	Total	4450	174	106
1985	M	1940	95	35
	F	1797	98	33
	Total	3737	193	68
1986	M	1667	110	53
	F	1530	78	36
	Total	3197	188	89
Total		11384	555	263

4450 to 3197, with no significant change in the total number of deaths; this resulted in a rise in the overall mortality from 6.3 percent to 8.7 percent.

### Neonatal deaths

There were 555 deaths among the neonates, a neonatal mortality rate of 48.8 per 1000. The 555 neonatal deaths thus accounted for 67.8 percent of the infant mortality. The chances of dying during the first month of life was therefore, 23 times greater than during subsequent months of the first year. Table II compares the major causes of neonatal deaths in the present series with data from Ibadan<sup>2</sup> and Ilorin.<sup>4</sup> Prematurity was the leading cause of death in all the three centres, while septicaemia, birth asphyxia and neonatal jaundice were also important causes. Significantly, combined neonatal jaundice and neonatal tetanus which accounted for 31.7 percent of neonatal deaths in Ibadan and 19.1 percent in Ilorin, were responsible for only 5.3 percent of neonatal deaths in Sokoto.

TABLE II  
*Main Causes of Neonatal Deaths in Present Study, Ibadan<sup>2</sup> and Ilorin,<sup>4</sup> respectively*

Cause	Percent of Total Deaths		
	Present Study	Ibadan <sup>2</sup>	Ilorin <sup>4</sup>
Prematurity	24.6	36.4	40.8
Septicaemia	14.3	7.6	5.8
Birth asphyxia	13.0	NA	23.7
Respiratory distress/			
Pneumonia	10.8	4.7	8.6
Congenital malformations	6.1	10.1	1.2
Meningitis	4.3	4.1	NA
Neonatal jaundice	3.4	14.9	7.8
Neonatal tetanus	1.9	16.8	11.3

NA = Not available

### Post-neonatal

There were 263 deaths after the age of one month, giving a post-neonatal mortality rate of 23.1 per 1000. The main causes of infant deaths in the post-neonatal period are shown in Table III. The leading cause of death in this age group was gastroenteritis, accounting for 92 (35.0 percent) of the deaths. Lower respiratory infections, septicaemia and anaemia accounted for 60 (22.8 percent), 36 (13.7 percent) and 27 (10.3 percent) of the 263 deaths, respectively.

TABLE III  
Main Causes of 263 Post-neonatal Deaths

Cause	No of Deaths	Percent of Total
Gastroenteritis	92	35.0
Lower respiratory infection	60	22.8
Septicaemia	36	13.7
Anaemia	27	10.3
Measles	13	4.9
Convulsions	11	4.2
Meningitis	9	3.4
Others	15	5.7
Total	263	100.0

### Discussion

The present study has highlighted the important contribution made by neonatal deaths to total infant mortality. The leading cause of neonatal deaths in the series was prematurity, contributing 24.6 percent. Premature labour in this series was probably associated with poor maternal nutrition and health and absence of antenatal care.<sup>5</sup> Other major causes of death included respiratory distress and pneumonia, accounting for 10.8 percent. Many serious illnesses in the neonate such as septicaemia or meningitis may also present with respiratory distress. In the absence of post-mortem examination therefore, it

is very difficult to attribute a death occurring in a neonate with respiratory distress to pneumonia alone. Birth asphyxia accounted for 13 percent of deaths in the present series. Many of the infants were born outside the hospital where traditional attendants supervised the delivery, or were born in hospital after the mother had been admitted in obstructed labour. Septicaemia, meningitis and tetanus together, contributed to 20.5 percent of the deaths. Unsterile delivery techniques at home and inadequate facilities to prevent the spread of infection, are probably to blame for these deaths.

Allowing for differences in classification of the causes of death, our data on neonatal deaths are remarkably close to those that had been reported from Ibadan<sup>2</sup> and Ilorin,<sup>4</sup> with the exception of neonatal tetanus. The extreme dry weather in Sokoto State, compared with the humid climate in the more southerly parts of the country, may explain this regional difference, which has been reported previously.<sup>6</sup> Idoko<sup>7</sup> has also reported a remarkably lower incidence of neonatal tetanus in the former Benue - Plateau State than in the southern parts of the country. Another factor may be related to the traditional differences in child-rearing practices by which, in Sokoto State, babies are bathed twice a day, after which, heat is applied to the umbilicus until the stump heals, thus making infection with tetanus organism less likely.

Gastroenteritis contributed to 35 percent of the post-neonatal deaths in the present series. The practice of oral rehydration therapy should contribute to a reduction of infant mortality from this cause. It is, thus, encouraging to note that 85 percent of mothers in Sokoto metropolis know how to prepare oral rehydration fluid and how to use it. The key to reducing mortality from lower respiratory tract infections however, seems to lie with the Primary-Health-Care workers, who are trained to recognise the main danger signs in respiratory infections and to apply appropriate treatment. Anaemia from a variety

of causes, including sickle-cell disease and malaria, accounted for 10.3 percent of total deaths in the series. Improved recognition and treatment of anaemia would reduce the number of these deaths, highlighting the need for providing facilities in the peripheral units, to carry out simple laboratory tests, such as haematocrit estimation and blood film examination for malaria parasites. Measles which is preventable by immunization, contributed only 4.9 percent of the total deaths, but it is likely that some of those who died from lower respiratory tract infection had unrecognized pertussis, another preventable disease. The Expanded Programme of Immunization (EPI) is expected to reduce deaths due to these vaccine-preventable diseases. Deaths from septicaemia, meningitis and febrile convulsions could be reduced by early recognition and referral to hospital, again with important implications for parental education and the training of Primary-Health-Care workers. Some children labelled as dying from febrile convulsions most probably had cerebral malaria. Early diagnosis and treatment of this, as well as meningitis and septicaemia, presupposes the availability of simple laboratory tests on a 24-hour basis.

Based on the findings in the present study, it is concluded that, many neonatal deaths can be prevented by health education to pregnant women on health generally, as well as on hygiene and nutrition; training for traditional birth-attendants who deliver women that are either unwilling, or unable to attend hospital, or clinics, for their confinement; education on the general care of newborn babies, including the importance of breast feeding, hygiene and cord care and the recognition of the cardinal signs of ill health in the neonate and provision of improved facilities for nursing sick neonates, in-

cluding the training of neonatal nurses and in intensive-care facilities. In the post-neonatal period, many of the deaths are preventable by ensuring a wide application of EPI, teaching of oral rehydration therapy as widely as possible, training Primary-Health-Care workers to recognize the key signs of serious illness in children and by providing facilities for simple laboratory tests in rural, general and specialist hospitals in the country.

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## *Acute Respiratory Infection in an Infant*

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### Summary

**Oviawe O and Oviawe N. Acute Respiratory Infection in an Infant.** *Nigerian Journal of Paediatrics* 1993; 20:21. A study of the episodes of acute respiratory infection (ARI) that occurred in a paediatrician's daughter during infancy, revealed 11 episodes with an average duration of 8.7 days (range: 3-18 days). In nine of the episodes, family members experienced ARI which preceded that of the infant by a mean of four days (range: two-seven days). Relevant factors to this ARI experience included family size, number of siblings at school and household irritants. Most of the ARI episodes in the infant required only liberal intake of oral fluids, breast feeding and nasal toileting.

### Introduction

ACUTE respiratory infection (ARI) remains a major cause of childhood morbidity and mortality in developing countries. It is estimated that more than four million children die of ARI each year.<sup>1</sup> Yet, its incidence remains undetermined in many African countries, especially in urban communities. Most workers<sup>2,3</sup> have reported the incidence of ARI to vary between five and seven episodes per annum, with lower incidence rates being reported for rural than urban communities.<sup>4</sup> The opportunity to determine and monitor the incidence of ARI in a Nigerian home came with the birth of our daughter. This short report thus concerns the episodes of ARI during the first year of her life.

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### Cases Report

RO was born at the University of Benin Teaching Hospital (UBTH), Benin, on 26th July 1990, following a full-term and normal pregnancy. Delivery was uneventful and the birthweight was 3.6kg. She was discharged home after 48 hours and after having received BCG immunization. At the six-bedroom home to receive the mother and daughter were myself, the father and also a paediatrician at the UBTH, four siblings (aged 5, 11, 12 and 14 years) and an uncle, aged 26 years. The home is located in a low density area of Benin and interaction between this non-smoking family and other children in the neighbourhood is minimal.

Having settled the baby fully at home, a diary was kept in which all episodes of ARI, their duration, effects on feeding, sleeping and mood were recorded. Also noted and documented were the incidence and duration of ARI in family members and family activities within and outside the home in which the baby also participated, e.g. visiting friends and relatives, participation in ceremonies, such as marriages,

funerals etc.

The baby was exclusively breastfed for the first four weeks and continued on the breast thereafter, for another six months. Infant formula was introduced at the age of one month and continued till the age of one year, while cereal and other weaning food items were introduced at four months. She was immunized, as and when due. During the 12-month period of study, the baby had 11 episodes of ARI; the first episode occurred at the age of 4.5 weeks, while the average duration of the ARI was 8.7 days (range, 3-18 days). The other family members also experienced ARI during nine (18.8 percent) of the 11 episodes and this experience by family members preceded that of the child's episodes by four days on the average (range, 2-7 days). ARI episodes occurred throughout the year, except December and March; there were two episodes in May.

Symptoms of ARI included nasal discharge (in 11 episodes), cough (in eight episodes), fever and blocked nose (in two episodes each), sneezing, wheezing and dyspnoea (in one episode each.) The symptoms among the family members included cough, nasal discharge, blocked nose and sneezing. Complications of ARI in the infant included poor feeding (during four episodes), secondary fever (during three episodes), secondary cough (during three episodes) and post-nasal drip (during one episode).

Management during eight of the 11 episodes consisted of encouragement of breast-feeding, liberal oral fluids (orange flavoured drinks), toileting of nasal secretion with cotton buds and mouth-to-mouth suctioning of nasal secretion. Drugs used included paracetamol syrup (during three episodes), chlorpheniramine (during two episodes) and ampicillin syrup (in one episode). The indications for treatment included irritability, temperature above 38°C, disturbance of sleep, feeding and dyspnoea. The wheezy episode lasted for less than one hour and was

not treated with any bronchodilator. The infant weighed 10.6kg at the end of one year.

### Discussion

This study has indicated a high incidence of ARI in the home of a paediatrician, located in an urban town. The 11 episodes of ARI experienced by the infant during the first year of her life were higher than those reported by others.<sup>2,3</sup> It is however, similar to a report from Bangkok<sup>5</sup> in which 11 episodes of ARI per annum, was also documented. By contrast, the number of episodes in the present case was slightly lower than the 13 episodes per annum reported from a rural town in Burkina-Faso.<sup>6</sup> The study has also confirmed that the most frequently occurring symptom of ARI is nasal discharge and that cough is less frequent. The discharge is usually mild and does not seriously disturb the daily activities of the infant. As this symptom may manifest simply as wetting of the nostrils, parents are likely to miss, or ignore it and thus may account for the low incidence of ARI reported in some studies.<sup>2,7</sup> Many factors may enhance the incidence of ARI. These include the out-of-home activities of the parents, school attendance by older siblings, large family size and usage of irritants in the home; this last factor may include parental smoking, cooking oil fumes and the use of insecticides.<sup>8,9</sup>

Most cases of ARI require no specific treatment. Encouragement of breast-feeding, ensuring adequate oral fluids, nasal toileting and suctioning will suffice in most cases. Among the symptoms of mild ARI, nasal congestion appears to be the most troublesome as it often disturbs sleep and feeding and consequently leads to irritability. Other signs that indicate the seriousness of ARI problem include secondary fever, cough and dyspnoea. Treatment of ARI with drugs such as paracetamol, chlorpheniramine and ampicillin or other suit-

able antibiotics either singly or combined, as was done in the present case, is strongly indicated when serious signs as mentioned above, develop.

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## Unusual Features of Haemolytic Crisis in Sickle-Cell Anaemia

Sir,

The case report by Olarenwaju, Ogunfowora and Njokanna<sup>1</sup> merits some comments. In the absence of jaundice, will it be correct to describe the crisis as haemolytic? Is acute splenic sequestration (ASS) not a more accurate description? ASS in children with homozygous sickle-cell disease (HbSS) typically presents with severe pallor, reticulocytosis and splenomegaly of varying degrees. It is one of the common causes of morbidity and mortality in young children with HbSS disease.<sup>2</sup> It can follow a mild febrile illness, or may be associated with a severe septicaemic illness such as pneumococcal pneumonia. In a prospective study by Topley *et al.*,<sup>3</sup> symptoms were found to be non-specific and may be mild or absent, even in fatal cases. It is most common between the ages of six months and two years, but can occur within the first five years of life. It is thus, my opinion that ASS is the diagnosis that best fits the patient in question.

Acute splenic sequestration tends to recur and mortality increases with recurrence.<sup>3</sup> Management of this condition is either by chronic blood transfusion or splenectomy. Splenectomy is recommended by Seeler and Shwaike;<sup>4</sup> it is preferred because of the problems associated with chronic blood transfusion. Moreover, in most tropical countries, blood for transfusion may not be easily available when most urgently needed. Also, as shown by the work of Rogers, Serjeant and Serjeant,<sup>5</sup> the immune functions of

the spleen are compromised with episodes of ASS. Two years ago, I managed a 13-month old male child with HbSS who, within a seven-month period, received three emergency blood transfusions for acute falls in haemoglobin. After the third transfusion, an elective splenectomy was performed and till date, this patient has not been transfused again.

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