African Journal of Medicine and Medical Sciences

Editor: O.A. Ladipo
Assistant Editors:
B.O. Osotimehin and A.O. Uwaifo

Volume 18
1989

BLACKWELL SCIENTIFIC PUBLICATIONS
Oxford London Edinburgh Boston Melbourne

Afr. J. Med. med. Sci. (1989) **18**, 43–47.

Morbidity pattern among Nigerian children from a poor urban community

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Summary

In a longitudinal study of the pattern of morbidity in a cohort of Nigerian children under five from a poor urban community, symptoms of respiratory tract infection were found to be the commonest during the study period. Nasal discharge had the highest incidence rate of 30.3 episodes per 100 child days followed by cough which had 12.2 episodes per 100 child days. Fever with or without other symptoms had an incidence of 10.8 episodes per 100 child days. The incidence of diarrhoeal disease of 3.3 episodes per 100 child days was much lower than that of the respiratory symptoms.

When stratified by age, the respiratory symptoms and fever were common among the younger age groups with a peak incidence at 13–24 months. Diarrhoea on the other hand had an earlier peak than the other three symptoms, being most frequent among those aged 7–12 months. Skin rash had the highest incidence rate among children aged 37–60 months.

Although it is not possible to describe a definite seasonal pattern of symptoms from this study, monthly distribution shows that nasal discharge occurred at an almost constant rate throughout the year, cough also occurred throughout the year with periods of decreased incidence in December and May. Fever as a symptom occurred throughout the study period with a decreased incidence in December and peaks in the late dry season. Although symptoms of diarrhoea were present throughout the study period, higher incidence rates occurred in the dry season. Skin rash occurred more frequently during the dry season and decreased during the rainy season.

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Résumé

Dans une étude longitudinale des tendances de morbidité dans une cohorte des enfants Nigérians au dessous de 5 ans issus d'une communauté urbaine pauvre, les symptômes d'infection de l'apprel respiratoire se sont avérés les plus répondus pendant la période d'étude. L'écoulement nasal a enregistré le taux le plus élevé d'incidence à 30.3 épisodes pour 100 jours-enfants, suivi par la toux avec 12.2 épisodes pour 100 jours-enfants. La fièvre sans ou avec les autres symptômes avait une incidence de 10.8 épisodes pour 100 jours-enfants. L'incidence de la diarrhée à 3.3 épisodes pour 100 jours-enfants était beaucoup moins élevée que celle des symptômes respiratoires.

En stratifiant selon l'âge, il a été observé que les symptômes respiratoires et la fièvre étaient plus répandus parmi les plus jeunes avec le sommet d'incidence intervenant entre l'âge de 13 à 24 mois. Par contre, le sommet d'incidence pour la diarrhée intervenait plus tôt que pour les trois autres symptômes notamment parmi ceux dont l'âge allait de 7 à 12 mois. Les éruptions de la peau avait l'incidence la plus élevée parmi les enfants de 37 à 60 mois.

Bienqu'il ne soit pas possible dans cette étude de décrire une tendance saisonnière claire des symptômes, une distribution mensuelle montre que l'écoulement nasal s'est produit à un taux constant pendant toute l'année, de même la toux s'est produit pendant toute l'année avec les périodes de moindre incidence en Décembre et en Mai. La fièvre comme symptôme s'est

produit pendant toute la période d'étude avec une incidence diminuée en Décembre et le sommet d'incidence à la fin de la saison sèche. Bienque la diarrhée ait été observée pendant toute la période d'étude, les taux d'incidences plus élevés ont été enregistrés dans la saison sèche. Les éruptions de la peau se produisaient plus fréquemment dans la saison sèche et diminisaient pendant la saison des pluies.

Introduction

Patterns of diseases in hospitals have largely been used as a pointer to the pattern of diseases in Nigeria because of the paucity of community-based data. Hospital-based data, particularly those from teaching hospitals have their limitations, and because they are highly selective are not a true reflection of what exists in the population at large.

Studies from developing countries have shown that communicable diseases and malnutrition are some of the most important causes of high childhood morbidity and mortality [1–3]. Uzodike [4] studying the pattern of paediatric emergencies in general practice reported that 95% of the emergencies seen were considered preventable. Childhood morbidity and mortality can be considerably reduced by an effective child health system as part of a comprehensive primary health care system. To plan an effective primary health care system, however, the pattern of common diseases in the community needs to be known and reviewed periodically. Due to the inadequacy of hospital-based data as a basis for health care planning, it is necessary to provide community based data on the pattern of morbidity with the hope that such information will be of assistance to health planners.

It is with the above objective in view that a study of morbidity pattern among Nigerian children under five from a low socio-economic background was carried out.

Subjects and methods

The study was carried out in Idikan community situated in the inner core of the city of Ibadan. The inhabitants belong to the low socio-economic status and are mostly artisans and petty traders. They live in units called households, each household consists of three to ten families. Each family consists of the husband, two or more wives and several children. Environmental sanitation is poor in this area with numerous open drains flowing on to the narrow streets.

Two hundred and fifty-six children aged from 0 to 5 years were randomly recruited and the study protocol were explained to their parents. Informed consent was obtained for all the children. The morbidity data were collected through weekly visits to the homes of the study children. The approach was basically symptom oriented using retrospective interviews of mothers in their homes by two female visitors. Between September 1984 and September 1985, a home visitor visited each child once a week to inquire about the presence of any symptoms on that day or the preceeding 6 days. Information recorded for the child included the presence or absence of fever, cough, vomiting, nasal discharge, ear drainage, eye discharge, anorexia, skin rash and diarrhoea (if diarrhoea was present, number and consistency of stools and the presence or absence of blood or mucus in the stool was recorded).

Validation of results

The home visitors were changed round periodically among the children to reduce interviewer bias and the method was validated by a paediatrician. A sub-study was carried out to evaluate the morbidity information obtained from mothers and recorded by home visitors. Once a week, a paediatrician examined ten children picked randomly who had already been seen on that day by the home visitors noting the presence or absence of specific symptoms. Throughout the study period, there were 480 such double assessments. The two sets of data were compared. The two independent assessments of fever agreed in 86%, nasal discharge in 98% and skin rash in 100% of the children. Of the 480 interviews, history of diarrhoea was recorded by the home visitors in 50 instances, of these 45 (90%) provided stool specimens which were of loose consistency.

Statistical methods

The morbidity data collected were collated and

statistical analysis was done using a hand held calculator. Age-specific incidence rates per 100 child days for the various illness symptomatology were calculated. The Chi-square test of association was used to determine any significant association between age and the occurrence of each symptom. The proportion of all monthly visits during which specific symptoms were recorded were computed for the 14-month surveillance period. The information for four symptoms (fever, cough, nasal discharge and diarrhoea) were plotted on a frequency polygon in order to depict their general pattern of occurrence over time.

Results

There were 256 children in all consisting of 140 males and 116 females. A total of 14,066 home visits were carried out to record details of the 10 symptoms specified; illness was present in 69.5% of all observation days.

Table 1 shows that the commonest illness symptoms among this cohort were those relating to the respiratory tract. Of the 10 illness symptoms inquired about during the surveillance period, nasal discharge had the highest incidence rate (30.3 episodes per 100 child days) followed by cough (12.2 episodes per 100 child days) and fever (10.8 episodes per 100 child days). Anorexia and skin rash had similar incidence rates, 4.9 and 4.0 per 100 child days respectively. In this community, the incidence of diarrhoeal disease of 3.3 episodes per 100 child days was much lower than that of the respiratory symptoms. Conjunctivitis, ear discharge and sore throat as illness symptoms occurred least frequently.

Table 2 shows the incidence of the six most common symptoms stratified by age. The incidence of nasal discharge rose from 29.9 per 100 child days among the 0–6 month age group to 35.8 per 100 child days among those aged 13–24 months, then gradually fell to 25.7 per 100 child days in the oldest group of children. There was a statistically significant association between age and occurrence of nasal discharge ($P < 0.05$). Cough as an illness symptom had a similar age distribution. With an incidence rate of 11.9 per 100 child days among those aged 0–6 months, rising to 15.2 per 100 child days among those aged 13–24 months and decreasing to 10.4 per 100 child days among the oldest children. The association between age and occurrence of cough was statistically significant ($P < 0.05$). This table shows that respiratory symptoms were more common among the younger age groups with a peak incidence in the age interval 13–24 months.

The incidence of fever as an illness symptom rose from 9.2 per 100 child days among those aged 0–6 months, to 13.8 for ages up to 24

Table 1. Incidence of illness symptomatology in a cohort of 256 under fives in Idikan community, Ibadan, Nigeria, 1984–1985

Symptom	Incidence per 100 child days
Nasal discharge	30.3
Cough	12.2
Fever	10.8
Anorexia	4.9
Skin rash	4.0
Diarrhoea	3.3
Vomiting	1.9
Red eyes/eye discharge	1.2
Ear discharge	0.3
Sore throat	0.2

Table 2. Incidence of illness symptomatology by age in a cohort of under fives in Idikan community, Ibadan, Nigeria (incidence per 100 child days)

Age group	Nasal discharge	Cough	Fever	Anorexia	Diarrhoea	Skin rash
0–6 months (n = 51)	29.9	11.9	9.2	4.5	2.9	2.7
7–12 months (n = 33)	34.5	13.1	13.8	5.7	5.5	1.2
13–24 months (n = 53)	35.8	15.2	13.8	5.9	4.4	4.5
25–36 months (n = 53)	31.8	12.8	11.3	6.0	2.8	4.1
37–60 months (n = 66)	25.7	10.4	8.6	4.3	1.6	5.2

months; and decreased to 8.6 per 100 child days among those aged 37 to 60 months. There was a statistically significant association between age and occurrence of fever ($P < 0.05$).

Anorexia as an illness symptom had a pattern similar to the previously described symptoms. With an incidence rate of 4.5 per 100 child days among those under 6 months, it rose to 6.0 per 100 child days among those aged 25–36 months then fell to 4.3 per 100 child days in the oldest age group. There was a statistically significant difference between occurrence of anorexia among the different age intervals ($P < 0.05$).

Diarrhoea had an earlier peak than the previous four symptoms. The incidence of diarrhoea was 2.9 per 100 child days among those aged under 6 months, and peaked at 5.5 per 100 child days among those aged 7–12 months. The incidence of diarrhoea thereafter gradually decreased to 1.6 per 100 child days among those aged 37–60 months. A statistically significant association was found between diarrhoea occurrence and age of the children ($P < 0.05$).

Skin rash had a pattern different from the other symptoms in that it had higher incidence rates among children 2 years and above. With an incidence rate of 2.7 per 100 child days among those younger than 6 months, 4.5 per 100 child days among those aged 13–24 months and 5.2 per 100 child days among those aged 37–60 months. The difference in the occurrence of skin rash at different age intervals was statistically significant ($P < 0.05$).

Figure 1 shows the distribution of the four most common symptoms (fever, cough, nasal discharge and diarrhoea) over time. Because the surveillance was conducted for only 14 months, one cannot definitely associate incidence of symptoms with seasons of the year. However these figures describe the monthly pattern over the period of surveillance. The figure shows that there were no marked changes in the rate of occurrence of nasal discharge in this cohort throughout the 14 months of surveillance. Cough also occurred throughout the year with periods of low incidence in December and May. Fever as a symptom occurred throughout the study period again with a low incidence of occurrence in December and peaks of occurrence in the dry season. Anorexia as an illness symptom occurred throughout the study period, with an

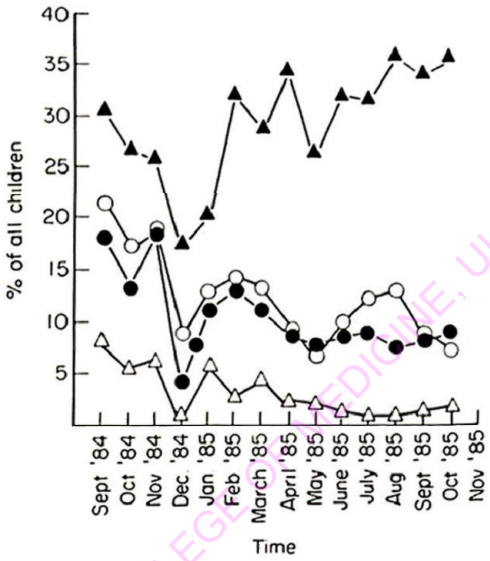

Fig. 1. Monthly pattern of occurrence of fever (●), cough (○), nasal discharge (▲) and diarrhoea (△) as illness symptoms among the under fives in Idikan, 1984–1985.

unusually high incidence in the first month of surveillance. The figure shows that diarrhoea, though present throughout the study period had higher incidence rates in the dry season. The incidence of diarrhoea during the year of study decreased from April to September (the rainy season) and gradually rose again from October. The incidence of skin rash during the study period was higher in the dry season and gradually decreased during the rainy season.

Discussion

This is one of the few reports of longitudinal, community-based study of morbidity pattern in Nigeria. The weekly visit to all the study children reduced the problem of recall associated with longer surveillance interval [5]. The finding of respiratory symptoms as the commonest illness symptoms in this cohort of children is similar to the findings from other parts of the world [6,7]. The incidence of diarrhoea in this study is much less than that reported in previous studies [6,8]. This low incidence might be due to the effect of health education activities of the primary health care centre that has been situated within the com-

munity for over 20 years and might not be representative of the incidence of diarrhoea within the city of Ibadan.

In general most symptoms were common in the younger age group, the only exception being skin rash. The incidence of respiratory symptoms were highest in the age group 13–24 months, this is different from previous studies [6,7,9] in which the incidence of respiratory symptoms did not vary much with age during the first 5 years of life. The age of peak incidence of fever as an illness symptom is similar to that of respiratory symptoms, this is expected because in a significant proportion of the children the fever is likely to be due to respiratory infections [10]. Malaria, the other common cause of fever in this community occurs less frequently in the very young due to some degree of protection offered by the maternal antibodies.

The highest incidence of diarrhoea occurs in children aged between 7 months and 12 months. This is similar to the age of peak incidence reported from other developing countries [6,8]. This age coincides with the age at which the children take more weaning diets and less of breast milk, so it is likely that food contamination accounts for the high incidence of diarrhoea in this age group. The incidence of the skin rash, mainly pyogenic skin infections and scabies was highest in the oldest group of children, this might be due to the fact that mothers pay less attention to the personal hygiene of the older children than the infants.

Although the study was not long enough to show clear seasonality in the pattern of illnesses, respiratory symptoms occurred frequently throughout the 14-month period, a finding consistent with an all-year-round transmission of respiratory viruses previously demonstrated [11]. Diarrhoea was present throughout the study period but the highest incidence is in the hot dry season, this might be attributable to shortage of water which becomes more marked during the hot season. Skin rash occurred more commonly during the hot dry season, this might be due to decreased frequency of bathing young children as a result of water shortage.

The morbidity information reported in this study shows that the children in this study, like children in many developing countries, suffer frequent episodes of infectious diseases. Their health can be significantly improved by effective health education, improved environment sanitation and an effective primary health care system.

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(*Accepted* 3 *December* 1987)