

## *Outbreak of Measles in an Orphanage*

EE EKANEM<sup>+</sup> AND AA ASINDI<sup>++</sup>

### Summary

**Ekanem EE and Asindi AA. Outbreak of Measles in an Orphanage.** *Nigerian Journal of Paediatrics* 1992; 19:52. An outbreak of measles that occurred among 11 of 16 inmates of an overcrowded motherless babies home in Calabar is presented. The last child, aged eight months, to be admitted into the home, was also the first to develop symptoms of measles, 11 days after admission; thus, it is suggested that this child was incubating the disease before his admission. The patients were aged, between four months and nine years; four patients were below the age of nine months, while six were aged between nine and 18 months; four of these six patients had been immunized against measles. Fifty percent of the 16 inmates were malnourished and of these, 87.5 percent developed measles. Complications of measles consisted mainly of diarrhoea, dehydration and bronchopneumonia. The case fatality was 27.3 percent. It is suggested from the present findings, that immunization of children at the age of six months and perhaps, below, in an environment of poverty and overcrowding should be a policy in our immunization schedule.

### Introduction

MEASLES remains a scourge in the developing world, causing an estimated 1.5 million childhood deaths per year.<sup>1</sup> Unfavourable adverse factors that contribute to this high mortality include malnutrition,<sup>2 3</sup> early age of onset and overcrowding.<sup>4 5</sup> The age for measles immunization in Nigeria was, as a matter of policy, changed in 1984, from six to nine months with the hope of stimulating a greater build-up of antibodies at nine months. Unfortunately, the benefit of this change has not yet been proven, hence the repeated demands for a review of the present policy.<sup>5-7</sup> An outbreak of measles in a motherless babies home (MBH) in Calabar, in

October 1991, prompted us to undertake the present study with the aim of finding out contributory factors to the morbidity and mortality of the disease.

### Patients and Methods

The present study involved 16 children who were inmates of MBH in Calabar; this home is a Cross River State institution, staffed by a social worker, a nurse and four female aides. At the time of the outbreak, 14 of the 16 children were accommodated in two separate rooms, each measuring 40 by 50 metres in size, while two older children occupied one small room. Information obtained about each child included age, dates of admission into the home and onset of symptoms, immunization status and the reason(s) for admission. Physical examination was undertaken on all the 16 inmates with particular attention to the nutritional status. All the children who developed measles were admitted into the department of paediatrics, University of Calabar Teaching Hosp-

---

University of Calabar

Department of Paediatrics

\* Lecturer

\*\* Reader

---

Correspondence: EE Ekanem

ital (UCTH). Complications and outcome of the measles were noted in each case.

**Results**

Table 1 summarizes the age, immunization status, dates of admission into the home and of the onset of symptoms in the 11 patients, aged between four and 108 months. The last child to be admitted (case No 1, Table 1) was eight months old on admission; this child was also the first to develop measles, 11 days after admission. It is noteworthy that after three days of the first case, two other children also developed symptoms of measles, while a third child developed measles symptoms seven days later. It will also be observed that of the 11 patients, four (case Nos 1,7,9 and 11) were under the age of nine months; six were aged between nine and 18 months, while one was 108 months (nine years) old. Furthermore, four of the six patients, aged between nine and 18

months, had received measles vaccine; all the four patients under nine months of age as well as two others, aged between nine months and nine years, had not been immunized. Thus, of the 16 inmates, nine (56.3 percent) had previously received measles vaccine; yet, four (44.4 percent) of the nine immunized children developed measles. Evidence of malnutrition was present in eight (50 percent) of the 16 inmates; of these eight with malnutrition, seven (87.5percent) developed measles. Complications and outcome in the 11 patients are listed in Table II. As can be seen, there

Table 1

*Age, Immunization Status, Dates of Admission and Onset of Measles in 11 Patients*

Case No	Age (months)	Immunization Status	Date of Admission	Date of onset of Measles
1	8	Nil	23-9-91	4-10-91
2	*16	BCG, DPT <sub>3</sub> Measles	12-9-90	7-10-91
3	*16	BCG, DPT <sub>3</sub> Measles	12-9-90	7-10-90
4	18	Nil	20-11-90	11-10-91
5	11	BCG, DPT <sub>3</sub> Measles	10-12-90	14-10-91
6	108	Nil	18-9-91	16-10-91
7	8	BCG, DPT <sub>3</sub>	9-4-91	17-10-91
8	12	BCG, DPT <sub>3</sub> Measles	18-10-91	20-10-91
9	7	BCG, DPT <sub>3</sub>	2-3-91	21-10-91
10	12	BCG, DPT <sub>3</sub>	18-10-91	23-10-91
11	4	BCG, DPT <sub>3</sub>	15-8-91	23-10-91

\*twins

Table II

*Age, Complications and Outcome of Measles in 11 Children*

Case No	Age (months)	Complications	Outcome (months)
1	8	Diarrhoea, dehydration	Died
2	16	Diarrhoea, dehydration, bronchopneumonia	Recovered
3	16	Diarrhoea, bronchopneumonia	Recovered
4	18	Bronchopneumonia	Recovered
5	11	Diarrhoea, dehydration, bronchopneumonia	Recovered
6	108	None	Recovered
7	8	Diarrhoea, dehydration, bronchopneumonia, septicaemia	Died
8	12	Oral thrush, septicaemia	Recovered
9	7	Diarrhoea, dehydration, bronchopneumonia, septicaemia	Recovered
10	12	Diarrhoea, dehydration	Recovered
11	4	Diarrhoea, dehydration, ?encephalitis	Died

were complications in 10 (90.9 percent) of the 11 patients, the commonest complications being diarrhoea with dehydration and bronchopneumonia. Three infants, under the age of nine months, died, a case fatality of 27.3 percent.

### Discussion

In the present study, the last child to be admitted into the MBH was also the first patient to develop measles. It might therefore be assumed that the measles outbreak in the small and closed community was introduced by this patient. The difficulty in accepting this assumption however, is the short interval of three to seven days between the exposure of the next three patients to the index case and their developing symptoms. With the known incubation period of measles, this period would be too short.

Adverse factors of age, malnutrition and overcrowding in our study were similar to those reported by others.<sup>2-5</sup> The case fatality of 27.3 percent in the present series, occurred in children, aged below nine months and several workers<sup>5-8</sup> have pointed out the devastating effects of measles in children in this age group. Indeed, a rapid decay in maternally-derived measles antibodies in Nigerian infants to very low levels at between the ages of five and six months, has been reported.<sup>9</sup> To our knowledge, the benefits of immunizing children in Nigeria against measles at the age of nine months rather than at six months have not been demonstrated. Thus, in an environment of poverty and overcrowding, it would be prudent to immunize children against measles at the age of six months. It is noteworthy that recent reports have shown the effectiveness of Edmonston-Zagreb measles vaccine in infants, aged between four and six months, without any risks of adverse reactions.<sup>10 11</sup>

It is of great interest that 44.4 percent of the immunized children developed measles. This may be a reflection of a poor response to vaccine in the presence of malnutrition;<sup>3</sup> it may also be due to a breakdown in the potency of the vaccine. Administration of human immune globulin (ISG) as a

preventive measure against measles, seems to have replaced isolation of children exposed to measles.<sup>12</sup> As ISG is not available in Nigeria, isolation policy remains our only option. While it may not be easy to diagnose measles in the pre-rash phase, there should always be a high index of suspicion. In Nigeria, the seasonal incidence of measles is well-documented, with a peak of infection in the dry season (November through March).<sup>8 13</sup> Thus, a child with fever, cough and conjunctivitis during this peak period, should be suspected of having measles and be isolated from crowded homes.

### Acknowledgements

The authors thank the resident staff and nurses in the UCTH and the orphanage who looked after the patients. We are equally grateful to Mr A M Udia and Mrs Patience Akpabio for their secretarial services.

### References

1. WHO Expanded programme on Immunization: survey for the WHO African Region WHO/EPI/GEN 89.2 AFR 1989:9.
2. Whittle HC, Bradley-Moore A, Fleming A and Greenwood BM. Effects of measles on the immune response in Nigerian children. *Arch Dis Child* 1973; **48**: 753-6.
3. Whittle HC, Nee J, Werblinska J, Onoura C and Gomwalk N. Immunity to measles in malnourished children. *Clin Exp Immunol* 1980; **42**: 144-51.
4. Morley D, Woodland M and Martin WJ. Measles in Nigerian children. *J Hyg* 1963; **61**: 115-34.
5. Hendrickse RG. Problems of future measles vaccination in developing countries. *Trans Roy Soc Trop Med Hyg* 1975; **69**: 31-4.
6. Taylor WR, Ruti-Kalisa, Mambu Ma-Disu and Weinman JM. Measles control efforts in urban African complicated by high incidence of measles in the first year of life. *Am J Epidemiol* 1988; **127**: 788-92.

7. Dabis F, Sow A, Waldman R, Bikakouri P, Senga J, Madzou G and Jones TS. The epidemiology of measles in a partially vaccinated population in an African City: Implications for immunization programmes. *Am J Epidemiol* 1988; **127**: 171-8.
8. Effiong CE. Immediate prognosis of severe cases of measles admitted to University College Hospital, Ibadan. *J Nat Med Ass* 1975; **67**: 455-60.
9. Ogunmekan DA, Brachen P and Marshall WC. A seroepi-demiological study of measles infection in normal and handicapped persons in Lagos, Nigeria. *J Trop Med Hyg* 1981; **84**: 125-8.
10. Whittle HC, Rowland MG, Man WH and Land RA. Immunization of 4-6 month old infants with Edmonston-Zagreb measles vaccine. *Lancet* 1984; **2**: 834-7.
11. Whittle HC, Hanlon P, O'Neill K, Hanlon L, Marsh V, Jupp E and Aaby P. Trial of high dose Edmonston-Zagreb measles vaccine in the Gambia: Antibody response and side-effects. *Lancet* 1988; **2**: 811-4.
12. Krugman S and Katz SL. Measles. In: *Infectious Diseases of Children*. London: CV Mosby, 1981: 159.
13. Asindi AA and Ani OEO. The pattern of measles in Calabar. *Nig J Paediatr*. 1984; **11**: 115-9.