

Clinical and Epidemiological Study of Measles Cases in Central Teaching Hospital of Pediatrics in Babylon Province

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Abstract

Background: It is an acute highly contagious disease occurs frequently in young children. It consists of three stages: An incubation stage of approximately 10–12 days. Prodromal stage with an enanthem (Koplik's spots) on the buccal and pharyngeal mucosa, low grade fever, conjunctivitis, coryza, and sometimes-increasing cough. A final stage of a maculopopular rash erupting over the neck and face, body, arms, and legs associated with high fever. **Objectives:** The aim of this study was to determine the epidemiology, clinical features, complications, effectiveness of vaccine and treatment on cases of measles. **Materials and Methods:** Prospective case study of measles cases who are less than 13 years of age admitted to central teaching hospital of pediatrics during the period between 1/4/2015-1/10/2015. Diagnosis of measles was done by the classical history of the prodromal, fever, and cough, conjunctivitis, followed by the appearance of the classical rash after few days of the prodromal stage with the presence of the pathognomonic Koplik's spots in some patients. Chest X-rays (CXR) was done to all patients with suspicion of pneumonia. In addition to CBC and blood film. GSE was done to all patients with gastroenteritis, in addition to CBC, blood film and stool culture. **Results:** Two hundred seventy-seven patients were studied. The male patients were (158, 57.03%) patients and the females were (119, 42.97%) patients, most of them (203, 73.28%) were not vaccinated (74, 26.72%) patients received the first dose of the vaccine at age of 9 months (21, 7.58%) patients received the first dose at 9 months with the second dose (MMR) at age of 15 months and only three patients (1.08%) received first, second, and third dose (MMR) at age of 4 years. The commonest clinical features were rash, fever, cough, conjunctivitis with coryza. Pneumonia was the commonest complication followed by gastroenteritis. There are only two cases of death: one due to severe pneumonia and the other due to septicemia and its complications. **Conclusion:** Measles is still a major health problem even in vaccinated children and the severity of illness is the same in both vaccinated and non-vaccinated children, with the peak age of incidence is during the second half of first year of life.

Keywords: Central teaching hospital, clinical, epidemiological study, measles

INTRODUCTION

It is an acute highly contagious disease occurs frequently in young children. It consists of three stages: An incubation stage of approximately 10–12 days. Prodromal stage with an enanthem (Koplik's spots) on the buccal and pharyngeal mucosa, low grade fever, conjunctivitis, coryza and sometimes-increasing cough. A final stage of a maculopopular rash erupting over the neck and face, body, arms and legs associated with high fever.^[1-3] Measles is endemic in most of the world. Epidemics tend to occur in spring especially in large cities. Communicability lasts for about 7 days from onset of prodrome and is maximal just before the rash appears. It's an RNA virus of the family paramyxoviridae, genus morbillivirus. It is about 140 nm

in diameter, with outer envelope consisting of lipid and protein. Measles virus is not a highly resistant organism, at room temperature it loses 60% of its infectivity in 3–5 days, its half-life is 2 hours at 37 Centigrade and only half an hour at 56 Centigrade, but it preserves well in the cold environment.^[4,5] The age at which measles occurs varies according to the environment. In developing countries, it is common in infants between 6 months and 2 years. But

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in developed countries it is common in preschool-aged children and in teen ages and young adults who have been vaccinated.^[1,6,7] In temperate climates, measles is a winter disease and epidemics occur biannually. In tropical and subtropical countries, the disease is more prevalent during the late spring and summer months.^[8-11] The incidence of measles in developed countries has decreased over the past 2 decades due to wide spread use of live attenuated measles vaccine.^[7] The essential lesion of measles is found in the skin, in the mucous membranes of the nasopharynx, bronchi, intestinal tract and the conjunctivae. Serous exudate and proliferation of mononuclear cells and few polymorphonuclear cells occur around the capillaries, in association with hyperplasia of lymphoid tissue, particularly in the appendix where multinucleated giant cells of up to 100 nm in diameter (warthin - Finkeldey reticuloendothelial giant cells) may be found. The skin lesion seen about the sebaceous glands and hair follicles. The Koplik spots consist of serous exudate and endothelial cells proliferation.^[12,13,14] The clinical feature of measles consist of prodromal stage: This stage begins about 10 days after infection and lasts until day 14, there is a fever, cough, coryza with conjunctivitis, the Koplik spots appear during the last 2 days of this phase.^[6] Exanthemata's stage: The temperature increases suddenly as the rash appears and sometimes reaches 40–40.5 C. The rash appears as faint macules on the upper lateral parts of the neck, behind the ears and on the posterior parts of cheek.^[11,4] During the first 24h the rash spreads rapidly over the whole face, neck, upper arms and upper part of chest.^[15-17] The treatment of measles consists of supportive measures, sedatives, antipyretics, bed rest and adequate fluid intake.^[3] Ribavirin is indicated for immune compromised patients with measles.^[1,3] Vitamin A supplementation is given for patients 6 months–2 years of age who are hospitalized for measles and its complications.^[11] The aim of this study is to determine the epidemiology of measles cases, the age group mostly affected, the sex ratio and the distribution of these cases whether it occur more in urban or rural areas in addition to the clinical features, the complications and the effects of vaccination and treatment on cases of measles.

MATERIALS AND METHODS

Two hundred seventy-seven patients less than 13 years of age with a clinical diagnosis of measles admitted to central teaching hospital of pediatrics/ Babylon province/ Iraq. During the period from 1/4/2015-1/10/2015, 158 were males and 119 were females. The following information's were obtained from parents including age, sex, residence, vaccination status, fever, cough, and coryza. Diagnosis of measles was done by the classical history of the prodromal, fever, cough, conjunctivitis followed by the appearance of the classical rash after few days of the prodromal with the presence of the pathognomonic

Koplik spots in some patients. Chest X-rays (CXR) was done to all patients with suspicion of pneumonia. In addition to CBC and blood film. GSE was done to all patients with gastroenteritis, in addition to CBC. blood film and stool culture. Statistical analysis done SPSS 22 frequency and percentage used for categorical data, mean, median and SD for continuous data. Chi-square used for assessed association between variables, person correlation show the correlation between continuous data. P-value less or equal to 0.05 is consider significant.

Ethical approval

The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with patients verbal and analytical approval before sample was taken. The study protocol and the subject information and consent form were reviewed and approved by a local ethics committee according to the document number 1234 (including the number and the date in 01/03/2015) to get this approval.

RESULTS

The incidence of age of children included in study are shown in Table 1; more incidence occur in age>1 month–1 year (26.72%).

According to Table 2, male (57%) and (61%) of children live on urban area. 100% of children have rash, 91% of them have fever.

Most of patient 203 (73.28%) were not vaccinated, 74 (26.72%) received the first dose of vaccine at age of 9 months, 21 patients (7.58%) received the first dose at 9 months with second dose (MMR) at age of 15 months and only three patients (1.08%) received first, second, and third dose (MMR) at age of 4 years [Table 3].

Table 1: Distribution of measles incidence according to age groups

Age	Number of cases	Percentage
0–1 month	2	0.72%
>1 month–1 year	74	26.72%
>1 year–2 years	38	13.71%
>2 years–3 years	33	11.91%
>3 years–4 years	29	10.47%
>4 years–5 years	19	6.86%
>5 years–6 years	20	7.22%
>6 years–7 years	11	3.97%
>7 years–8 years	17	6.14%
>8 years–9 years	12	4.34%
>9 years–10 years	3	1.09%
>10 years–11 years	12	4.33%
>11 years–12 years	7	2.52%

Table 2: Distribution of children according to sex, residence, and symptoms

Sex	No.	Percentage
Male	158	57.03
Female	119	42.94
Total	277	100
Residence	No.	Percentage
Urban	169	61.01
Rural	108	38.99
Total	277	100
Symptoms and signs	No.	Percentage
Rash	277	100
Fever	253	91.33
Cough	219	79.06
Conjunctivitis	215	77.61
Vomiting	195	70.39
Dyspnea	43	15.52
Koplik's spot	12	4.33
Otitis media	9	3.24
Convulsion	0	0

Table 3: Distribution of children according to vaccine taken

Vaccinated	No. of patients	%
Not vaccinated	203	(73.28%)
First dose of vaccine	74	(26.72%)
First dose at 9 months	21	(7.58%)
Second dose (MMR)	3	(1.08%)

Table 4: Distribution of children according to complications

Complications	No. of patients	%
Pneumonia	79	28.51
Gastroenteritis	35	12.63
Otitis media	11	3.97
Laryngotracheobronchitis	5	1.80
Gingivostomatitis	5	1.80
Septicemia	1	0.36

Pneumonia was the commonest complication reported in 79 patients (28.51%) followed by gastroenteritis which is reported in 35 patients (12.63%). The list of complications, which were detected among the studied group in order of frequency, There are two cases of death: one because of severe pneumonia and its complications (female age 2 years and 5 months) and the other was due to septicemia (male age 19 months) [Table 4].

Treatment

153 patients (55.23%) received antibiotics. 218 patients (78.70%) received vitamin A supplementation, of those only 15 patients (5.41%) had more than single dose of vitamin A. Intravenous fluid was given to some patients with gastroenteritis special those with repeated vomiting [Table 5].

Table 5: Distribution of children according to treatment received

Treatment	No. of patients	%
Received antibiotics	153	55.23
Received vitamin A	218	78.70

DISCUSSION

In this study, the peak age incidence of measles is during second half of first year of life because of the transplacental passage of maternal antibiotics which persist for the first 4–6 months of the life and disappear at variable rate. Marin *et al.*^[18] and Gastanaduy *et al.*^[7] found that the peak age incidence is during the second year of life, and Compel *et al.*^[4] and McLean *et al.*^[19] mentioned that the peak age incidence is in 5–10 years and preschool, teenage, respectively, while Jahan *et al.*^[20] found that the peak age incidence is in 6–11 months of age. There are two cases reported in this study, one aged 15 days' male and the other was 23 days old female. Both of them were from rural areas with history of maternal and other sibling's measles with no family member had received any measles vaccine. This is not reported in any other study as neonatal cases of measles. About the sex incidence there is no much difference between male and female ratio, with males 158 (57.03%) patients and females 119 (42.97%) patients, this incidence is about to be similar to what has been found by Marin *et al.*^[18] in which males were (46.25%) and females (53.75%), others like Herrera^[21] has found that males are (53.7%) and females are (46.3%). Although Jahan *et al.*^[20] found that males were (46.5%) and females (53.5%), Hyde *et al.*^[22] found that males were (52%) and females (48%). About the residence, the majority of patients came from urban areas (61.02%), whereas 38.98% came from rural areas, because the people in rural areas consult the primary health centers in the area and only complicated cases referred to the urban areas, these results are consistent with studies done by Benn *et al.*^[23] and Kiraly *et al.*^[24] Hyde *et al.*^[22] found that (92%) of patients came from urban areas and (8%) only came from rural areas. The higher percentage of admitted cases to the hospital were during April (96) patients and the least number admitted during September (7) patients, this result about to be similar to what had been found by Lopez *et al.*^[25] who found that most of cases occur during Spring months. According to signs, symptoms and complications, the rash which is the commonest presenting feature occur in (100%) of patients. Hyde *et al.*^[22] found that it occurred in (96%) of cases. Fever appeared in (91.33%) of cases, Hyde *et al.*^[22] found that it occurred in (86.8%) of cases. The cough reported In (79.06%) of patients, whereas Gregory A. Poland *et al.*^[26] found that it occurred in (53.2%) of cases. Conjunctivitis occur in (77.61%) of cases, Gastroenteritis which is reported in (12.63%) of patients was reported to be only (8.7%) by Hyde *et al.*,^[22] whereas Marin *et al.*^[18] found it

(52.7%) and Kiraly *et al.*^[24] found it only (15%). Koplik's spots reported in (4.33%) of patients, whereas others like Gregory A. Poland *et al.*^[26] found it occurred in (17.2%) of his cases. Pneumonia which was reported in (28.51%) of patients, was found to be only (7.5%) by Hyde *et al.*^[22] and (21.8%) by Kiraly *et al.*^[24] and (86.5%) by Marin *et al.*^[18] Otitis media reported in only 9 patients (3.24%) was found to be only (0.5%) by Hyde *et al.*^[22] Convulsion was not reported in any of patients but Marin *et al.*^[18] found it occur in (3.6%) and Kiraly *et al.*^[24] found it occur in (0.595%) of cases. About the vaccination status, most of cases (77.28%) were not vaccinated, whereas Jahan *et al.*^[20] found that (62.1%) were vaccinated and Hyde *et al.*^[22] found that (75%) of patients were vaccinated. There were (7.58%) of patients received the MMR at age of 15 months, Hyde *et al.*^[22] found that (42%) of patients received the MMR at age of 15 months. There are (2cases) dead in this study, 1 because of severe pneumonia and the other 1 due to septicemia, while in Hyde *et al.*'s^[22] study there are (3 cases) dead, 2 of them due to severe pneumonia and other 1 due to encephalitis. About the treatment, (55.23%) of patients received Antibiotics, while in Marin *et al.*'s^[18] study there are (26.3%) of cases received Antibiotics, and (46.2%) of cases received Antibiotics. (78.7%) of patients received Vitamin A supplementation while in Kiraly *et al.*^[24] it was (92.5%) of patients and in Hussein (67%) of patients received Vit. A supplementation.

CONCLUSION

Measles is still a major health problem even in vaccinated children and the severity of illness is the same in both vaccinated and non-vaccinated children, with the peak age of incidence is during the second half of first year of life.

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Conflicts of interest

There are no conflicts of interest.

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