Measles Outbreak in Qatar 2007

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Abstract:

To analyze the epidemiological and clinical characteristic of a measles outbreak in Qatar in 2007, the records of 212 confirmed cases of measles were analyzed retrospectively, confirmation being based on clinical suspicion of the disease with a positive measles IgM (170 cases) and /or exposure to a laboratory confirmed measles case during the infectious period (42 cases; epidemiologic link). Eighty five percent of the cases occurred between April and July. Seventeen percent were in infants < 1 year of age, 47% in children between 1 - 5 years of age, 24% in school age children ≤ 10 year of age and 12% in children >10 years old. Vaccinations were up to date in 60% of cases, second dose missed in 30% and no vaccination in 10% because of travel outside the country, concurrent illness, or lack of transportation. Thirty one percent of the cases required admission, with a mean hospital stay of four days. Cases were reported predominantly in Pakistani and Qatari patients, living mainly in three areas within the capital, Abu Hammour, Al Rayyan, and Al Mamuora.

Conclusion:

Status of vaccination in Qatar needs careful analysis and the vaccination schedule should be reviewed. Early administration of vaccine, increasing community awareness, a well-coordinated school-based immunization program and immunization campaigns are required to prevent future outbreaks.

Keywords: Measles, Outbreak, Qatar, Vaccination

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Introduction:

Despite the availability of an effective vaccine developed more than 30 years ago, measles still affects millions of people annually. In 2002 the World Health Organization (WHO) reported 40 million cases of measles every year, with 745,000 deaths each year.[1,2]

Measles is a highly communicable disease; lifelong immunity usually follows the primary infection.[3] The disease is marked by prodromal fever, cough, coryza, conjunctivitis, and pathognomonic enanthema (Koplik spots), followed by an erythematous maculopapular rash. Although measles signs and symptoms can mimic other viral illnesses, the measles immunoglobulin M (IgM) test is considered a reliable diagnostic test.[3,4]

The American Academy of Pediatric (AAP) recommends a two dose regime for measles vaccination but some authors in developing countries where epidemics are observed in young children recommend an additional dose before one year of age.[3,5,6,7,8,9] The State of Qatar applies a regime of two doses, one at the age of 12 months and a second at 4-6 years as part of a mandatory vaccine program for school entrance. Serum measles antibodies develop in approximately 95% of children vaccinated at 12 months of age and 98% of those vaccinated at 15 months of age.[3] Two doses of the vaccine give up to 99% protection against the disease[3].

Outbreaks are likely to occur if missed cases accumulate gradually over a number of years[3] or vaccination failure occurs due to improper vaccine storage, handling or incorrect administration of the vaccine.[3] Measles vaccine is given in combination with mumps and rubella (MMR) and are both heat and light sensitive. This might compromise the efficacy of the vaccine in developing countries with hot climates if it is not properly stored and transported.[3]

Methods:

The charts were reviewed retrospectively of children aged 14 years or younger with a diagnosis of measles or suspected measles, reported to the public health and/or presented to one of the pediatric emergency centers during the outbreak between January and December 2007. A measles case was defined by clinical suspicion of

the disease with a positive measles IgM and /or exposure to a laboratory confirmed measles case during the infectious period, four days before to four days after the rash onset (epidemiologic link).

Probable measles cases were identified from PEC database ICD-10, code (B05) for measles and in addition all pediatric measles cases reported to the public health during the study period were looked at for eligibility. All patients' data were integrated from patient charts and the electronic lab result system of the hospital (Therp). The following data for eligible patients were collected; demographics, presenting signs and symptoms, history of contact with suspicious measles case, vaccination status, length of stay in hospital for admitted patients, complications, morbidity and mortality if any. In addition all eligible patients were called confirming their vaccination status, number of measles vaccine received before presentation, health centre where vaccinations were given and reasons for not being vaccinated.

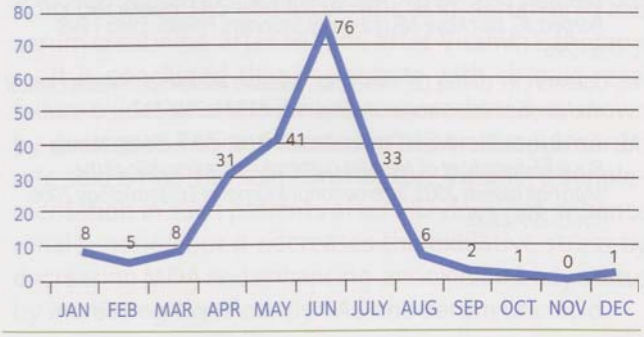
During the outbreak 65 pediatric blood samples were not tested for measles IgM, due to shortage of the reagent but were stored in refrigerator in virology lab at 4 °C temperature, the study was budgeted to process the IgM test on the stored samples, to enroll the maximum number of patient.

Results:

Among the 374 reviewed files, 212 met the inclusion criteria, 170 had positive IgM and 42 were epidemiologically linked. Cases were reported throughout the year 2007 with a peak incidence from April-July (Figure1).

There was an equal male to female ratio. The nationalities of the affected patients were Pakistani 48%, Qatari 27%, Iranian 9%, and Indian 6%.

Figure 1: Cases presentation according to month



Although cases occurred throughout the country the highest incidence were seen in Abu Hammour area 20 %, Al Rayyan and Messameir areas 19 % and Al Mamoura area 15% where lower socio-economic classes commonly live (Table 2).

Seventeen percent of the cases were in infants < 1 year of age, 47% in children between 1-5 years of age, 24% in school age children 10 year of age and 12% in children >10 years old. One third of patients had a history of contact with measles or suspected measles case. All identified cases presented with fever and skin rash. Koplik spots were reported in 10% and conjunctivitis affected 9%. The most common complications were gastroenteritis 36%, pneumonia 19%, and otitis media 3%.

Sixty percent of the children had received two doses of measles vaccine or were vaccinated up to age as per the American Academy of Pediatric (AAP) recommendation[3].Thirty percent of cases omitted one dose, while 10% missed two doses of their due measles vaccine. The most common reported causes of failure of receiving vaccine were, traveling abroad 37%; illness during the vaccination period 25%, and lack of transportation to reach the vaccination center 19% (Table 1).

Thirty one percent of the cases required admission to hospital with a mean hospital stay of four days, three cases needed ICU admission for a diagnosis of encephalitis, severe gastroenteritis with electrolyte disturbances, and croup with severe respiratory distress. No deaths in children were reported during this outbreak.

Table 1: Reasons for not being vaccinated

CAUSE	NO	%
Travelling	31	37.0
Ill	21	25.0
Lack of transport	16	19.0
No Health Card	11	13.0
Visitor	3	3.5
Make the child ill	2	2.5
TOTAL	84	100

Table 2: Distribution of confirmed case by area

AREA	NO	%
Abu Hamour	42	20.0
Al Rayyan and Meazer	40	19.0
Al Mamoura	32	15.0
New Doha	13	6.0
Al Matar	11	5.0
Others	74	35.0
TOTAL	212	100%

Discussion:

Measles is one of the most infectious diseases known to man and remains a leading cause of death among young children worldwide.[1]

In this study, 17% of the cases were in children aged under one year, compared to 19%-45% reported in the

previous study This might indicate the need for an early vaccine introduction as suggested from previous literature[3,5,6,7,8,9]. Forty-nine percent of the study population had complications, consistent with previous literature that reported measles complications ranging between (23% -68%).[9,10,11] In this study pneumonia was found in 19% of measles complication which was previously variably reported as ranging between 32% and 77%.[9,12,13] Gastroenteritis was reported in 36%, which is similar to previous studies ranging between 28%-44%.[5,6,9,12]

Although many complications were observed during this outbreak no deaths were reported although deaths following an outbreak were frequent in previous studies.[7,8,9,11,14,15] Thirty-one percent of the study population needed hospital admission with a mean stay of four days, compared to previously reported admissions of between 12%-27%.

In this study, 60% of cases occurred in vaccinated individuals, consistent with other studies from Saudi Arabia and Egypt,[5,10] possibly due to an accumulation of missed measles cases or vaccination failure.

Forty percent of the study population missed one or more of their due measles vaccine, reasons for missing vaccine is shown in **(Table 1)**, which indicate the necessity for conducting a more comprehensive vaccine program, and the importance of raising the community awareness towards the disease and the needful vaccination.

Areas with lower socioeconomic class in the country e.g. (Abu Hammour, Al Rayyan, and Meazer) expressed a larger outbreak, which is described as a risk factor in previous literature.[8,9,12,13] In addition, the disease was reported mainly in Qatari and Pakistani nationalities.

Both of the above identify a group of population at a higher risk for future outbreaks, and locate areas where the needed interventions have to be started from.

Status of vaccination in Qatar particularly in areas with high incidence during the epidemic has to be carefully analyzed and vaccination schedule should be reviewed. Comprehensive plan with holistic approach supervised by health authority considering early administration of vaccine, increasing community awareness, well coordinated school-based immunization program, and immunization campaigns, are required to prevent future outbreaks.

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