Rapid communications

NOSOCOMIAL MEASLES CLUSTER IN DENMARK FOLLOWING AN IMPORTED CASE, DECEMBER 2008-JANUARY 2009

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A cluster of six confirmed cases with identical measles virus genotype was reported in Denmark between December 2008 and January 2009. Transmission occurred among unvaccinated children aged 15-23 months admitted to the same hospital as a 36-month-old unvaccinated girl diagnosed with measles following travel. The findings highlight the importance of vaccination before travelling and adherence to the routine vaccination schedule.

Introduction

In Europe, recommendations regarding vaccination against measles vary, with the first dose of measles, mumps and rubella (MMR) vaccine recommended at around 13 months of age (range 9-23 months) [1]. According to the Danish routine immunisation schedule, MMR is recommended at the age of 15 months (first dose) and 4 years (second dose) [2]. A study aimed at estimating the age of children vaccinated between 2001 and 2005 showed a frequent delay in administering the first dose of the MMR vaccine in Denmark (Table) [3]. Since 1999, coverage with the first dose of MMR vaccine has been 89-90%, and coverage with the second dose 86-88% [3].

With 12 cases of measles reported in 2008 the national incidence rate in Denmark has reached 0.2 per 100,000 inhabitants [4].

Between 1 December 2008 and 30 January 2009, a cluster of six confirmed cases of measles occurred among children aged 15 to 36 months admitted to the paediatric department of Hvidovre Hospital in Denmark. The index case had recently returned from Africa. None of the six children had been vaccinated with the first dose of MMR, although it is recommended at the age of 15 months. They were admitted to hospital for reasons other than measles.

The paediatric department in Hvidovre hospital is an enclosed area consisting of four sections with 50 beds, including the emergency room, and a playing area.

Cases were confirmed by a positive measles IgM antibody test and considered nosocomial if the patient had been exposed to measles during hospital stay. The case definition and classification used was based on the European Commission Decision of 28 April 2008 [5].

Outbreak description

The first patient was a three-year-old girl who had returned from a four-week holiday in East Africa. She was admitted to

Hvidovre Hospital on 1 December 2008, two days after returning to Denmark, with symptoms of gastroenteritis. On admission rash was noticed. The following day the maculopapular rash spread from the face downwards on the trunk, and measles was suspected and confirmed. On day four the patient recovered and was discharged.

The second case was a 15-month-old boy admitted to the same hospital on 18 December. He had an earlier history of asthmatic bronchitis and was admitted to hospital due to fever despite of antibiotic treatment for pneumonia. He stayed in the paediatric emergency room, in the paediatric ward and in the playing area. He developed a rash on 21 December, and measles was suspected on 22 December. He recovered gradually and was discharged after eight days of hospitalisation.

The next four cases were 16 to 26 months of age, and were admitted to the hospital for various illnesses around 20 December, before measles was suspected in the 15-month-old boy described above. These four patients were readmitted on 7 and 8 January 2009. They developed rash and measles was confirmed. After a few days they recovered and were discharged. The exact sequence of events is shown in the Figure below.

All six cases were confirmed by a positive test for measles IgM antibody. The epidemiological link between the index case and the second case was not verified, however, viral isolates obtained

TABLE

Percentage of vaccinated with the first dose of measles mumps rubella (MMR) vaccine, by age, Denmark, 2001-2005

Year	< 18 months	18-23 months	24-35 months	> 36 months
2001	76	16	5	3
2002	74	18	6	2
2003	74	18	6	2
2004	75	19	5	1
2005	77	18	5	-

Source: Valentiner-Branth P, Glismann S, Christiansen AH, Andersen PH, Simonsen JB. MMR-vaccination: Coverage by end 2007. EPI-NEWS 2008;36 [3]

populations. The outbreak-cases were all above the age in which it is recommended to receive MMR vaccination in Denmark.

None of the cases reported in this outbreak had been vaccinated against measles. For three children the reasons for non-vaccination were chronic illnesses that do not contraindicate MMR vaccination. One child had not received the vaccine due to egg allergy which is no longer considered a contraindication to MMR vaccination. Two children were not vaccinated without any apparent reason.

As shown in the Table, in Denmark the proportion of children who receive vaccination with delay is considerable thus expanding the susceptible window between declining maternal antibodies and protection from the first dose of MMR. These missed or postponed vaccinations without obvious medical reason constitute an area where efforts to improve compliance with guidelines are recommended. More accurate knowledge of the parents about immunisation safety, effectiveness and timing may increase timely vaccinations. Improvement of the vaccination coverage is required to reach the 95% needed to eliminate measles virus transmission in the population [9].

With 12 cases reported in 2008, most physicians rarely diagnose measles. The outbreak described in this paper illustrates the difficulties in management of measles in a health care system where the disease is uncommon, and the suspicion is not necessarily aroused on admission, with the risk of transmission of measles virus to vulnerable patients. Also in 2008 an outbreak involving five cases of measles occurred in Denmark following one imported case [10]. Health-care providers should continuously be aware of symptoms of measles and include measles in differential diagnoses for febrile rash illnesses particularly in patients with recent travel to measles-endemic areas.

To protect infants from contracting measles when travelling and to prevent from transmission in Denmark, the MMR vaccine is recommended to infants from nine months of age before travelling to measles-endemic areas, and to all non-immune individuals of all age groups before travel and in general [11]. Young adults may have low levels of measles immunity as they were born too early to have been part of the two-dose MMR vaccination program (introduced in Denmark in 1987) and have grown up in a period when exposure to wild measles virus was declining.

An epidemiological survey made by the Surveillance Community Network for Vaccine Preventable Infectious Diseases (EUVAC.NET) including national surveillance data from 32 European countries reported 12,132 cases of measles during the period 2006-2007 [12]. Most cases were among unvaccinated or incompletely vaccinated children. This epidemiological report shows that major parts of Europe still have problems in maintaining herd immunity with a vaccination coverage of 95%, especially in minority communities contributing with a larger risk of cluster outbreaks [13,14]. Several outbreaks have been reported in 2008 [4]. The World Health Organization (WHO) measles elimination plan for Europe by 2010 [9] demands continued focus and enhanced international vigilance to achieve success.

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