Nosocomial transmission of measles among healthcare workers, Bulgaria, 2010

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This report describes 326 cases of nosocomial transmission of measles with 286 cases among non-healthcare workers who acquired the disease in a hospital setting. Between October 2009 and April 2010, 40 healthcare workers from seven different regions in Bulgaria have contracted the disease.

Measles is a potentially severe highly contagious disease. However, at least 98% of those receiving two doses of measles-mumps-rubella vaccine (MMR) are protected against the disease. Preliminary reports for 2010 show that there were more than 30,000 measles cases in the Member States of the European Union (EU) / European Economic Area (EEA) – the highest number of measles reported in Europe in more than 10 years [1]. The highest number of cases was reported in Bulgaria, followed by France, Italy and Germany [1]. Measles continues to spread in 2011 with more than 4,000 cases reported in the EU/EEA in January and February [1].

Outbreak overview

The current outbreak in Bulgaria started in March 2009 following an imported case of measles from Germany [2]. It has been the largest outbreak ever reported in Bulgaria since the large outbreak which occurred in 1976, only a few years after the immunisation schedule with one dose of monovalent measles-containing vaccine starting with the age of 10 months had been implemented in the country. The second dose was introduced at four years of age in 1982. In 1993 the first dose of monovalent measles-containing vaccine was replaced by the MMR vaccine. Since 2001 the two-dose measles immunisation with MMR vaccine has been introduced with the first dose at 13 months and the second at 12 years of age [3].

In this outbreak, the total number of cases reached 24,253 during the two-year period, reached its peak in March 2010 and started gradually to subside in late summer [unpublished data]. Only a few cases were reported every week in September and October 2010 [3]. However, according to preliminary results, about 130 cases were notified in the first three months of 2011, some of them diagnosed in late December 2010 but notified in January 2011. This calls into question whether it is at all possible to control such a contagious disease in a short time and in the presence of many pockets of susceptible individuals.

Of the 24,137 cases with full epidemiological and clinical data available, 3,917 (16.2%) were laboratory-confirmed (measles IgM), 7,944 (32.9%) were epidemiologically linked and the remaining 12,276 (50.9%) were probable cases. The highest incidence rate was observed in children under one year of age (n=4,717; 6/100,000 population) who were not eligible for MMR vaccination. Despite the ongoing outbreak, the Bulgarian health authority did not change the recommendation regarding MMR vaccination, i.e. did not recommend the first dose to be given earlier, at the age of nine months. Of the 24,047 cases investigated, 89.3% belonged to the Roma ethnic community. The majority (86.8%) were hospitalised, mainly due to epidemiological considerations – patients from overcrowded households with poor living conditions and inadequate access to medical care. Twenty-four deaths were reported but no information on complications is available at the moment [4].

Transmission in medical settings

Transmission in medical settings was reported for 326 cases and the hospital was the most frequently reported setting. Of these 326 cases, 286 were not healthcare workers and acquired measles in hospital or primary care.

By April 2010, 40 healthcare workers (HCWs) (0.16% of all measles cases) in seven different regions in Bulgaria have contracted the disease. Most of them occurred during the peak of the outbreak, in March 2010. The measles case definition in Bulgaria is based on the EU case definition [5]. Twenty-three cases were classified as confirmed (presence of measles-specific IgM antibodies) and 17 as probable (not tested). Laboratory tests of all but two were performed at the National Reference laboratory of measles, mumps and

rubella in Sofia. Thirty-four cases occurred in hospitals and six in primary care.

The mean age of the cases among HCWs was 38 years (range 24–48 years) and 28 of them were women. The largest group of measles cases among HCWs were physicians (n=19), followed by laboratory technicians (n=8), nurses (n=7), cleaning staff (n=4) and pharmacists (n=2). All but one are likely to have acquired the infection from patients and one physician from a colleague. Ten HCWs developed radiologically proven pneumonia and all recovered. Fifteen HCWs were hospitalised due to dehydration or pneumonia.

According to their age, the majority of cases should have been vaccinated with at least one dose of measles-containing vaccine, as one dose measles immunisation was introduced in Bulgaria in 1969 and in 1972 it became part of the immunisation schedule in the whole country. Nevertheless, only one case had a vaccination record of two doses of measles-containing vaccine; the rest did not know their vaccination status.

No secondary cases among other contact patients and family members were reported. Information about susceptibility status or post-exposure prophylaxis of the HCWs' contacts was not available.

Control measures

Two supplementary MMR vaccination campaigns were implemented. The first one started on 27 April 2009 and targeted all individuals aged between 13 months and 30 years in the affected regions (Razgrad, Shumen, Silistra and Dobrich), who had not undergone the full vaccination with two doses. Later, in order to increase the vaccine coverage, a second campaign was directed towards those older than 30 years without documented measles vaccination [4]. These measures were not very effective maybe because they were not implemented simultaneously for all 28 regions in Bulgaria. On the other hand, a large number of cases might have received a supplementary vaccine dose when already infected with measles virus. Post-exposure immunoglobulin for people at risk for a severe form of the disease was not routinely given. The full analysis of the outbreak is still in progress.

Discussion

Measles among HCWs accounts for a relatively small proportion of the reported cases but is important because of the potential for transmission of the disease to susceptible colleagues (thereby disrupting healthcare service), high-risk patients such as pregnant women, immunocompromised individuals, and family members. They have a nearly 19-fold higher risk of acquiring measles than the general population [6]. Transmission among HCWs was also reported in France in 2010 [7,8]. The Advisory Committee on Immunization Practice in the United States of America recommends all healthcare personnel to have presumptive evidence of immunity (positive serological test results or written evidence of appropriate (two doses) immunisation to mumps, measles and rubella or being born before 1957). For unvaccinated persons born after 1957 who lack evidence of mumps, measles and/or rubella immunity or laboratory confirmation of the disease, healthcare facilities should recommend two doses of MMR vaccine during an outbreak of mumps or measles and one dose during an outbreak of rubella [9]. European countries in general should recommend measles vaccine for HCWs who do not have documented vaccination record or history of the disease. This outbreak highlights the need for further activities with respect to vaccinating non-immune HCWs. Moreover, it illustrates that a high rate of hospitalisation for measles poses a risk for nosocomial infections that may have a detrimental effect on certain immunocompromised or non-immune patients and HCWs. Therefore, strict hygiene measures are important to prevent the spread in hospital settings.

The 40 cases of measles identified in HCWs in the course of this outbreak further highlights the need for such recommendations. Increased vaccine uptake among HCWs of other contagious diseases like varicella and influenza also needs to be considered in medical settings. Maintaining a high immunisation coverage and strengthening surveillance are essential if Europe is to meet the new elimination target of 2015.

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