

MEASLES OUTBREAK IN THE NIŠAVA AND TOPLICA DISTRICTS

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Measles are a highly contagious viral disease. Until the discovery of a vaccine, it was one of the most common diseases of children younger than 5 years. The aim of this paper was to present the measles outbreak in the territory of the Nišava and Toplica Districts in 2015. To detect outbreaks, the recommendations of the Commission for Infectious Diseases of the European Union (EU) from 2012 were used. Analysis of blood serum was carried out in the reference laboratory of the Institute of Virology, Vaccines and Sera Torlak. From January to 31st of August 2015, 240 patients with measles were registered, of which 103 (42.9%) men and 137 (57.1%) women. The first sick person was detected on the 11th of January (six-year-old unvaccinated child from Niš). The largest number of patients was registered in April (71) and May (61). Of the total number of patients, 210 (87.5%) were younger than 40 years. The largest number of patients was registered in the age of 1-4 years (n=55), 30-34 (n=20) and 35-39 (n=16). Only two (0.8%) persons were vaccinated with two doses, 7 (2.9%) had received one dose of vaccine, 127 (52.9%) were unvaccinated and in 104 (43.3%) patients vaccination status was not known. The diseases was laboratory confirmed in 120 (50%) patients, 55 (22.9%) were suspected cases in which the epidemiological link was established, in 40 clinically diagnosed cases serum was not taken. Twenty-five sera were negative. Complications were found in 57 (33.1%) patients, of which 21 (36.8%) had diarrhea, 8 (14.05) had pneumonia, and in 7 (12.3%) cases malnutrition was registered. Before the introduction of vaccination in 1971, measles were the disease among the youngest population. After the introduction of vaccination, the structure of patients was altered - the number of patients younger than 5 years decreased, and the number of those older than 15 increased. In the present epidemic, the majority of cases were unvaccinated, and in the vaccinated population more than ten years after the vaccination had elapsed. Due to the limited duration of immunity, vaccination coverage less than 95% of the vulnerable population, irregular supply of vaccine as well as the increasing activity of the anti-vaccine lobby, new cases of measles can be expected in the future. *Acta Medica Medianae* 2016;55(2):71-75.

Key words: measles, vaccination, epidemics

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Introduction

Measles is a highly contagious, acute viral disease (1). Before the vaccine was available, infection with measles virus was nearly universal during childhood, and more than 90% of the population were immune by the age of 15 years. The first live attenuated vaccine was licensed for use in the United States in 1963 (Edmonston B strain) (2).

The case-fatality rate is approximately 15%. Measles is still a common and often a fatal disease in developing countries (3).

The aim of the paper was to describe the measles outbreak in the Nišava and Toplica Districts in 2015.

Material and Methods

For the investigation of the outbreak, the general principles of the case definition of the European Union (EU) Commission Decision of 2012 were used (1). Laboratory investigations of initial patients were collected at the Center for Control and Prevention of Diseases in the Institute of Public Health Nis, and all specimens were sent to Belgrade to the Institute of Virology, Vaccines and Sera "Torlak".

Virological surveillance of viral infections is carried out in cooperation with the epidemiology service at the network level of Institutes of Public Health in the Republic of Serbia, and in coope-

ration with the clinical physicians in different in-patient health institutions, in line with the current epidemiological situation. The diseases such as poliomyelitis, influenza, intestinal and respiratory viral infections, morbilli, rubella, varicella, mumps and hemorrhagic fever diseases have been continuously monitored at the territory of the Republic of Serbia.

Results

Since the beginning of 2015, a measles outbreak was registered in the Nišava and Toplica Districts. A total of 240 cases were registered up to the end of August 2015. The first case was notified on the 11th of January 2015, in a six-year-old non-vaccinated child from the city of Niš. A measles outbreak was registered on the 30th of March 2015. Almost all cases lived in Niš or in the neighboring rural places and had many contacts with the urban population.

From the beginning of January until 31st of August 2015, a total number of 240 measles cases was notified by the local public health authorities. The monthly incidence increased from 1 case registered in January to a peak of 71 cases in April and decreased in May when the number of notified cases was 61 (Figure 1). The highest number of cases was in the municipalities of Niš 186 (77.5 %).

Overall, the majority of cases 210 (87.5%) were under the age of 40 years. The highest num-

ber of cases (n=55) was reported in children aged between 1 and 4 years, followed by adults 30 and 34 (n=20 cases) years of age, and adults from 35 up to 39 (n=16) (Figure 2).

In the measles outbreak, there were 103 (42.9%) males and 137 (57.1%) females. More male subjects were reported in the two age groups: 1-4 years (58.5%: 41.5%) and 30 - 34 (71.4%:28.6%). There were more registered measles cases in females after 35 years of age, (Figure 2).

Vaccination status of registered cases is shown in Figure 3.

The majority of the outbreak cases had not been vaccinated against measles. Only 2 subjects (0.8%) had received a full course of vaccination (two doses of the measles, mumps, and rubella (MMR) vaccine, 7 (2.9%) received one dose, while 127 subjects (52.9%) were unvaccinated. For 104 (43.3%) cases vaccination status was unknown.

Laboratory findings are shown in Figure 4. Of all the notified measles cases, 120 (50%) were laboratory-confirmed, 55 (22.9%) were probable cases with documented epidemiological link, and there were 40 (27.1%) clinical measles cases for whom sera could not be obtained. Twenty-five cases were refused.

Of the total number of measles cases, complications presented in 57 (33.1%). Twenty-one (36.8%) cases developed diarrhea, 8 (14.05) pneumonia, 7 (12.3%) cases developed malnutrition.

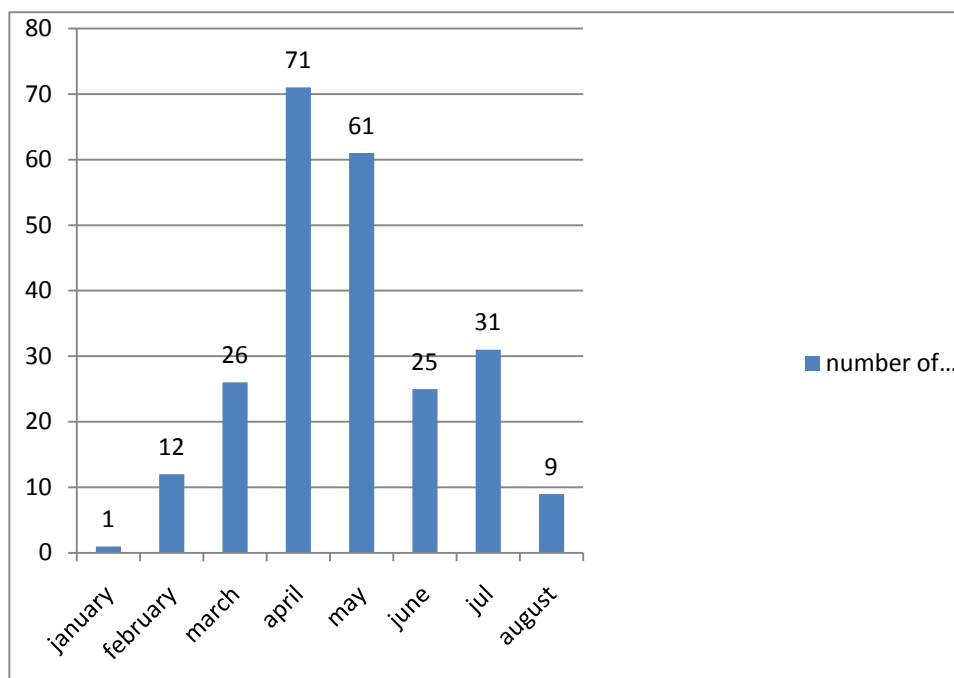


Figure 1: Reported measles cases by month of rash onset, Nishava and Toplica District, January-August 2015

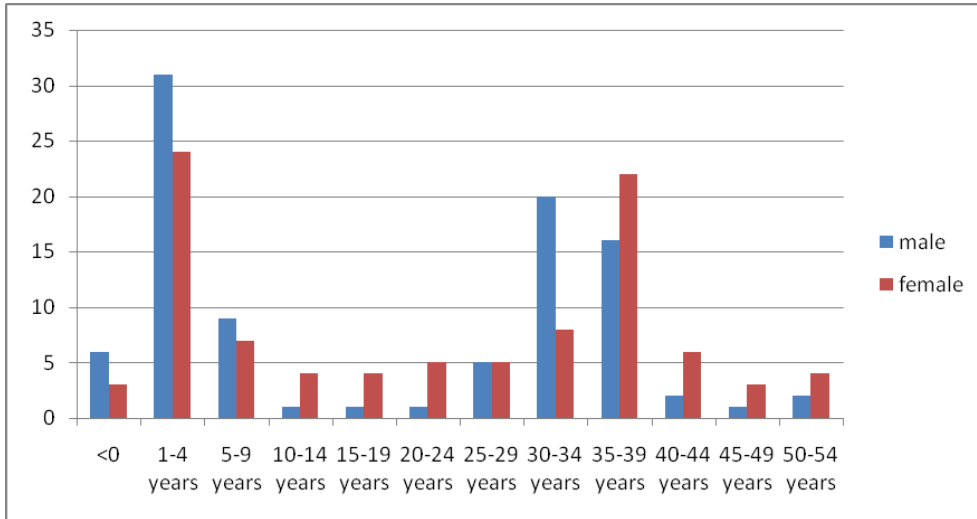


Figure 2: Age and sex distribution of measles cases in the measles outbreak, in the Nišava and Toplica District, from January to August 2015

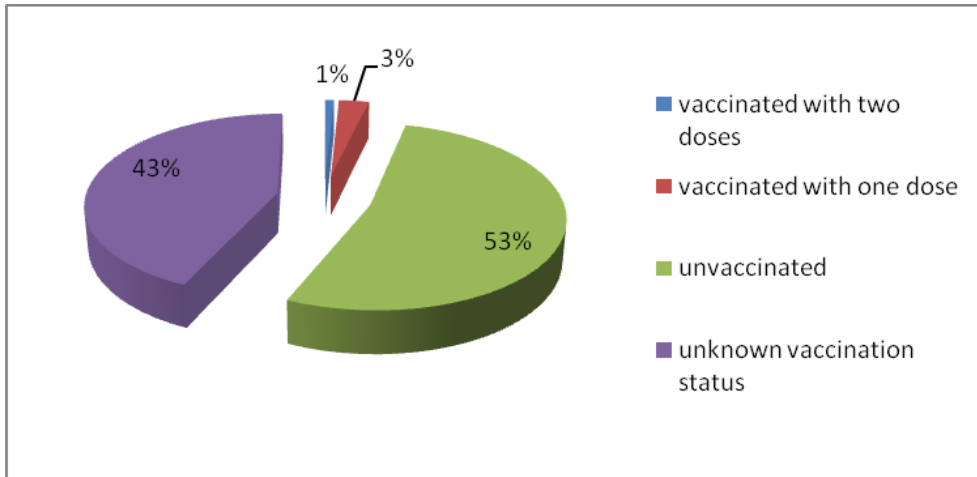


Figure 3: Vaccination status

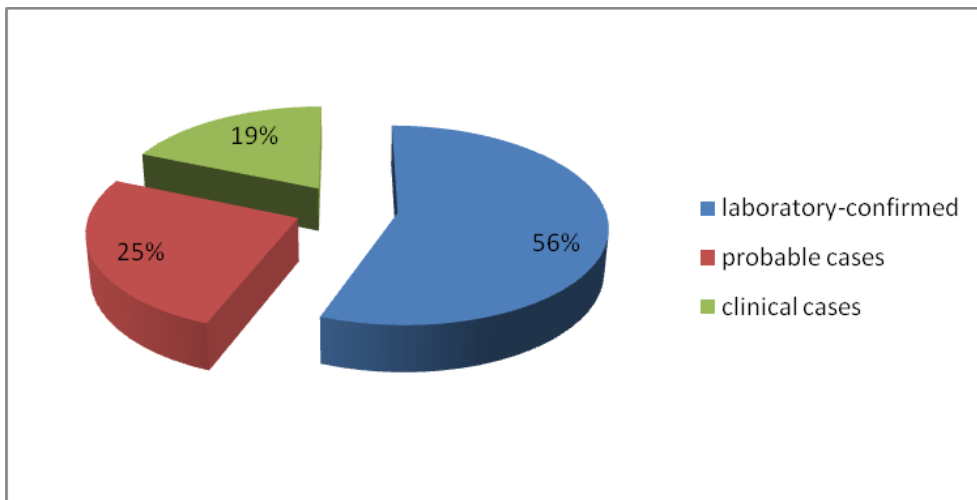


Figure 4: Laboratory findings in the measles outbreak

Discussion

Measles is a highly contagious, acute viral disease that can lead to complications such as pneumonia, encephalitis, and death (4). Measles is still a common and often fatal disease in developing countries (5).

The number of notified measles outbreaks especially in central and western Europe has been increasing in the last five years, with a reported peak in 2011 (32 124 cases) (6).

Several countries reported a considerable number of cases, including: France, Bulgaria, Germany, Italy, Romania, Spain, Ukraine, and the United Kingdom (7-9). The ongoing outbreak of measles in the Federation of Bosnia and Hercegovina accounts for 3.804 cases, highlighting the region as a European hot spot for the disease (6).

In order to achieve 95% immunity in the population for measles, vaccination coverage with two doses needs to be higher than 95%. However, this was not achieved in the EU (8), and, similarly, the Federation of Bosnia and Hercegovina has accumulated a large unvaccinated population over a long period of time. Vaccination coverage in the Nišava District is measured as the percentage of the vaccinated target population (12 months and 6 years). MMR vaccine coverage between 1998 and 2015 in the Federation of Bosnia and Hercegovina ranged from 80.7% (1999) to 96.2% (2007) (average value: 87.1 ± 4.12) for primary immunization and from 53% (2006) to 91.9% (2008) (average value: 82.9 ± 8.83) for the second dose. Disruption in the immunization programme during the war (1992-1995) and in the post-war period (1996-1998) left a considerable number of children susceptible to measles, as well as mumps and rubella (4,6).

The possible cause of the measles outbreak described here is insufficient vaccination. The majority of those affected had not received necessary

vaccination (two doses of MMR) at the recommended time (up to 14 years of age). Our data demonstrate that most cases in the current outbreak either did not know their vaccination status (20%) or reported being either partially (8%) or not vaccinated at all (70%).

Detection of IgM in acute serum is the recommended test for rapid determination of acute measles infection. Collection of serum specimens for serologic detection of measles antibody in conjunction with a respiratory sample (nasopharyngeal swab or aspirate or throat swab) is helpful in the laboratory confirmation of a measles case. IgM antibody is generally detectable 3 days after the rash onset and can be detected up to 28 days (4-6).

In order to prevent further spread, and to control the epidemic, persons with measles were asked to stay at home. The vaccination of unvaccinated children was recommended to parents, as well as unvaccinated persons in families, kindergartens and schools, according to the national regulations. Active case finding was initiated by general practitioners in the areas most affected by the outbreak, as well as contact-tracing in hospitals and in the community.

Conclusion

In the period before vaccination against measles it was the disease of the youngest population. Vaccination modified the age distribution – it reduced the number of sick in the youngest age and increased the number of the persons older than 15. In the presented measles outbreak, the majority of persons were vaccinated more than ten years before. Due to the limited duration of immunity, vaccination coverage less than 95% of the vulnerable population, irregular supply of vaccine as well as the increasing activity of the anti-vaccine lobby, new cases of measles can be expected in the future.

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EPIDEMIJA MALIH BOGINJA NA TERITORIJI NIŠAVSKOG I TOPLIČKOG OKRUGA

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Male boginje su veoma kontagiozno virusno oboljenje. Do otkrića vakcine, bilo je jedno od najčešćih oboljenja dece mlađe od pet godina. Cilj rada bio je da prikaže epidemiju malih boginja na teritoriji Nišavskog i Topličkog okruga u 2015. Za otkrivanje epidemije korišćene su preporuke Komisije za zarazne bolesti Evropske unije (EU) iz 2012. Analiza krvnog seruma vršena je u referentnoj laboratoriji u Institutu za virusologiju, vakcine i serume "Torlak". Od januara do 31. avgusta 2015. registrovano je 240 obolelih od malih boginja, 103 (42.9%) muškarca i 137 (57.1%) žena. Prvi koji je oboleo otkriven je 11. januara (šestogodišnje nevakcinisano dete iz Niša). Najveći broj obolelih registrovan je u aprilu (71) i maju (61). Od ukupnog broja obolelih, 210 (87.5%) je bilo mlađe od 40 godina. Najveći broj obolelih registrovana je u uzrastu 1-4 godine (n=55), 30-34 (n=20) i 35-39 (n=16). Samo su dve osobe bile vakcinisane sa dve doze (0.8%), 7 (2.9%) je primilo jednu dozu vakcine, 127 (52.9%) bilo je nevakcinisano a kod 104 (43.3%) obolelih vakcinalni status nije bio poznat. Laboratorijski je potvrđeno obolenje kod 120 (50%), 55 (22.9%) su bili suspektne slučajeve kod kojih je utvrđena epidemiološka povezanost, kod 40 klinički dijagnostikovanih serum nije uzet. Negativno je bilo 25 seruma. Komplikacije su utvrđene kod 57 (33.1%) obolelih i to kod 21 (36.8%) dijareja, 8 (14.05) je imalo pneumoniju, a kod 7 (12.3%) utvrđena malnutricija. Pre uvođenja vakcinacije 1971. godine, male boginje su bile bolest najmlađih. Od uvođenja vakcinacije izmenjena je struktura obolelih, smanjen je broj obolelih kod mladih od 5 godina, a povećan kod starijih od 15 godina. U prikazanoj epidemiji, najviše je bilo nevakcinisanih, a kod vakcinisanih, je prošlo više od 10 godina od vakcinacije. Zbog ograničenog trajanja imuniteta, obuhvata vakcinacijom manje od 95% osetljive populacije, neredovnog snabdevanja vakcinom, kao i sve veće aktivnosti antivakcinalnog lobija, mogu se očekivati novooboleli od malih boginja i narednom periodu. *Acta Medica Medianae* 2016;55(2):71-75.

Ključne reči: male boginje, vakcinacija, epidemije

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