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RESEARCH ARTICLE

Measles, One of the Re-emerging Diseases

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ABSTRACT

Objective: The aim of the study is to stand out the measles which is a highly contagious re-emerging viral illness and may cause severe complications in susceptible population.

Methods: This retrospective study was conducted on patients who were diagnosed with measles in the department of Infectious Diseases, Erciyes University Hospital, between January 2013 and February 2014. The diagnosis of measles was confirmed by measles specific immunoglobulin M (IgM) antibody positivity in serum samples.

Results: Nine patients were included the study. Three patients had a co-morbid condition including hematopoietic stem cell transplantation, pregnancy and diabetes mellitus. Four of the patients had hepatitis and one of them had pneumonia as a complication.

Conclusion: Susceptible population, especially immunocompromised people are still at risk about measles. Adherence to universal vaccination programs is determinative in terms of breaking out of an outbreak. *J Microbiol Infect Dis 2016;6(1): 19-22*

Key words: Measles, immune-suppression, adult, outbreak

Kızamık; Yeniden Ortaya Çıkan Bir Hastalık

ÖZET

Amaç: Çalışmanın amacı bulaştırıcılığı yüksek ve ağır komplikasyonlarla seyreden viral bir enfeksiyon hastalığı olan kızamığa dikkat çekmektir.

Yöntemler: Ocak 2013- Şubat 2014 tarihleri arasında Erciyes üniversitesi Tıp Fakültesi Enfeksiyon Hastalıkları ve Klinik Mikrobiyoloji Bölümü'nde kızamık tanısı ile takip edilen hastalar retrospektif olarak incelendi. Kızamık tanısı serum örneğinde kızamık spesifik immunoglobulin M pozitifliği ile doğrulandı.

Bulgular: Çalışmaya dokuz hasta alındı. Hematopoetik kök hücre nakli, gebelik ve diyabetes mellitus olmak üzere üç hastada komorbidite mevcuttu. Kızamık komplikasyonu olarak dört hastada hepatit, bir hastada pnömoni gelişti.

Sonuç: Duyarlı popülasyon ve özellikle immunosupresif hastalar kızamık açısından risk altındadır. Salgınların önlenmesi için aşılama programlarına uyum önemlidir.

Anahtar kelimeler: Kızamık, immunosupresyon, erişkin, salgın

INTRODUCTION

Measles is a highly contagious acute viral illness which may cause heavy complications and death [1]. It is difficult to limiting the spreading of disease in susceptible population because of high reproductive numbers [2]. Although, strategic plan for global measles eradication was commenced by The Health Organization (WHO), the measles outbreaks are occurring in the worldwide and also in Turkey. WHO reported eight outbreaks at The European Region in 2013 [3]. Turkey has been carried out 'Measles Elimination Program' since 2002 [4]. Because of routine vaccination of measles and increasing the number of vaccinated children, pandemic incidence has decreased. However, in the last few years, with increasing the cases of measles in the neighboring countries, measles cases have been reported again in Turkey, too. The incidence of measles was 1.3 per 100000 population in 2013. There was an in-

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crease in the reported cases in a year from 318 to 6731 cases. Eighty percent of the outbreaks have been seen in large cities and that getting migration. One of the city reported measles is Kayseri. [4]. Previously, the reported outbreak could be seen in determining the genotype D6, however most common genotype was reported as D9 in 2011 [5]. Genotype D8 was reported in 2013 and the index case was a three-year old unvaccinated girl who had a history of contact with the Syrian neighborhoods [6]. These types of genotypic changes are thought that the sourced cases are from abroad [4,5].

In this report, we presented demographic characteristics of patients who had the diagnosis of measles in our department. Early diagnosis and isolation precautions are important because of the increased number of the cases. We also aimed to emphasize the importance of the vaccination and diagnosis of immunosuppressive patients.

METHODS

This retrospective study was conducted on patients who were diagnosed with measles in Department of Infectious Diseases, Erciyes University Hospital, Kayseri, Turkey between January 2013 and February 2014. The study was approved by the Erciyes University Faculty of Medicine Ethics Committee. Patients who had fever, conjunctivitis and rash were hospitalized with the suspicion of measles. Enzyme-linked immunosorbent assay (ELISA) technique was used for the diagnosis of serological assay (Euroimmun-Germany). The diagnosis of measles was confirmed by measles specific immunoglobulin M (IgM) antibody positivity in serum sample. The disease was diagnosed with clinical suspicion and laboratory confirmation. Standard isolation airborne precautions were applied for every patient who was suspected measles until the result of ELISA, and were followed closely for the complications of measles.

Age, gender, occupation, history of exposure, duration of fever and rash, clinical and laboratory findings were recorded. The time between the beginning of symptoms and admission of hospital were recorded as admission time. Under the level of 4000 mg/dl of white blood cell (WBC) were considered as leucopenia and 150 x10^3 mg/dl of platelet considered as thrombocytopenia. Hepatitis was defined as an increase in alanine aminotransferase levels to >2.5 the upper limit of normal value [6]. Pneumonia was defined as the presence of clinical signs and chest X-ray abnormalities. All relevant data was extracted from the charts and electronic records from the time of hospital registration.

RESULTS

Nine patients were included in the study. The mean age of patients was 27.0 ± 3.8 years and five of them (55.5%) were female. We failed to get information about the source of infection except a medical student and a health care worker. Mean admission time to the hospital was 6.2 [2-15] days. Three patients had a co morbid condition including hematopoietic stem cell transplantation (HSCT), pregnancy and diabetes mellitus.

Table 1. The characteristics of the cases.

Gender/age (year)	Profession	Admission time to (day)	Additional Disease	White blood cell (cells/mm^3)	Platelet count x10^3 mg/dl	ALT (U/L)	Outcome
M/33	Computer Programmer	3	DM	7020	203	348	Recovered
F/29	Housewife	5	Pregnancy (14 weeks)	7880	186	29	Recovered
F/26	Housewife	7	No	3550	114	393	Recovered
M/27	Engineer	7	No	4400	142	395	Recovered
F/26	Housewife	5	No	4650	150	45	Recovered
F/29	Healthcare Worker	7	No	2550	119	39	Recovered
M/20	Student	15	ALL, ABMT (after 5th month +GVHD	5310	128	33	Recovered
F/30	Teacher	5	No	2240	48	101	Recovered
M/23	Medical student	2	No	-		-	Recovered

ALL=acute lymphocytic leukemia, ABMT=Allogeneic bone marrow transplantation, GVHD=Graft versus host disease, DM=Diyabetes Mellitus ALT=Alanine aminotransferase

One of the patients was a medical student who claimed a history of measles when he was a child. He suffered from with fever on 8th day of the contact, and the rash was appeared on his face and head two days after the fever. Rash and conjunctivitis were shown on Picture 1. Another patient was an allogeneic HSCT receiver due to acute lymphocytic leukemia, and treated with two kinds of immunosuppressive drugs for the graft versus host disease (GVHD). He had fever and rash on his body and arms, fifteen days before the admission. When he admitted to our department, he had severe lesions on his oral mucosa.

Four of the patients had hepatitis; one of them had pneumonia as the complication of measles.

In the laboratory examination, three of the patients had leucopenia and five of the patients had thrombocytopenia. Median recovery time of the fever and the rash were 4.1 ± 1.5 and 5.3 ± 2.1 days, respectively. The demographic characters, clinical and laboratory values were shown in Table 1.

All of the patients recovered with the supportive treatment.

DISCUSSION

Measles virus that is an enveloped non-segmented, single stranded negative sense RNA virus belongs to the genus Morbilivirus of the family Paramixoviridea [8]. The virus is spread by direct contact with droplets from respiratory secretion of infected people. Droplets that include virus can remain in the air for several hours [8]. Despite using widespread and long-standing vaccination programmers, the number of measles cases has been increasing steadily. Increasing number of unvaccinated people and international transporting of the virus are the most important cause of the increasing of the measles cases [9]. In Europe, the incidence per 1 million population of measles was 27134 in 2012, this number has increased to 31,520 in 2013 [10]. During these years the incidence of measles per 1 million population was 698 and 7404 respectively in Turkey [10]. In our department, an epidemic was reported which included six patients in 2002 [11]. After this epidemic, only sporadic cases were seen until 2013. Because of the travels, wars and the immigrants, the number of the cases has been in decreased to nine in a year such as the globally world.

Hungerfort et al. found the independent risk factors as incomplete/partial vaccination for age, under age for routine vaccination and hospital admission [12]. We could not have the knowledge about the vaccination. However, because of the occupation and co-morbid disease, thirty-five percent of the patients had the history of hospital admission. (Table 1). We found a high proportion of patients with hepatitis (44% of all cases). The incidence was similar with the reports described previously in young adults [6,13].

Patients with defects in cell mediated immunity (AIDS, lymphoma, or other malignancies) have the higher risk for severe, progressive measles virus infection [14]. Mortality is changing 40% to 70% in immunosuppressive patients [8]. Exanthema may be absent or severe and desquamative or the purpura may be seen in the clinical presentations [8]. Kawamura et al. reported that the seropositivity rate was estimated to be less than 44% six years after the allogeneic HSCT in adults [15]. Development of acute GVHD has also been reported to be a risk factor for seronegativity [16]. The seroconversion rate is also lower than the immunocompetans (more than 90 percent). Aytaç et al. found this rate 55% after HSCT [17]. These rates were 65% and 70% in other studies [18,19]. Our immunosuppressive patient was diagnosed with ALL and treated with cyclosporine and mycophenolate mofetil for the diagnosis of GVHD. The mortality of disease was higher because of early period of allogeneic HSCT and acute GVHD. However he was treated successfully with the supportive therapy.

R0 is the expected number of secondary cases was caused by an infectious individual in its lifetime. From this definition, it is apparent that when R0<1, each infected person generates less than one new infected person, and it is predicted that the infection will decrease the population. If the R0 is less than one, the pathogen is able to spread the susceptible population. In an endemic infection, control measures can be established, and at what magnitude, would be most effective in reducing R0 below one, providing important guidance for public health initiatives [20,21]. Classically basic reproductive number of measles is 12-18 but, it has been published as 1.2 in last epidemic [22]. Nine cases we followed did not cause a second case of measles except one who is a medical student. This limitation may be due to high vaccination coverage for measles, which is over 98% according to WHO data in Turkey [23]. After the outbreaks, routine measles vaccination age was switched nine months.

In conclusion, susceptible population and especially immunocompromised people are at risk about measles, adherence to universal vaccination

programs is determinative in terms of breaking out of an outbreak.

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