

Clinical and laboratory features of adult measles cases detected in Van, Turkey

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Abstract

Objective: To evaluate adult measles patients with respect to their clinical and laboratory findings as well as complications.

Methods: The retrospective study was conducted at YuzuncuYil University, Van, Turkey, between December 2012 and June 2013, and comprised cases diagnosed with measles. The diagnosis was based on clinical findings and all were serologically confirmed with the presence of Anti-measles Immunoglobulin M antibodies.

Results: Of the 50 records studied, 41(84%) related to women. Overall mean age was 25.52±4.07 years. The most common symptoms were fever and rash 50(100%), malaise 49(98%), cough 48(96%), headache 44(88%) and sore throat 36(72%). The presence of Koplik spots, lymphadenopathy and hepatomegaly were observed in 3(6%), 6(12%) and 2(4%) patients respectively. Thrombocytopenia and elevated liver enzymes were detected in 26(52%) and 22(44%) patients. Pneumonia was the most common complication in 9(18%) patients. Other respiratory complications were bronchitis 5(10%) and laryngotracheitis 6(12%). Of the cases, 9(18%) exhibited otitis media. Premature delivery and spontaneous abortus occurred in 2(4%) and 3(6%) patients of the 15(30%) pregnant women.

Conclusion: Measles continues to be an important health problem in Turkey and needs an effective elimination programme.

Keywords: Measles, Adult, Complication, Pregnancy. (JPMA 65: 273; 2015)

Introduction

Measles is an acute, contagious, feverish exanthematous infection and follows a course of winter-spring outbreak lasting 3 to 4 months which may be every 2 to 5 years.¹ Although there is an effective vaccine against measles, but it still remains an important health problem worldwide which may affect almost all of the non-immune individuals. Diverse complications, including otitis media (7-9%), pneumonia (1-6%), diarrhoea (6%), post-infectious encephalitis (0.1%), sub-acute sclerosingpanencephalitis (SSPE) (0.001%) and death (0.1-0.3%), often accompany measles.^{2,3} Measles is a disease with a good prognosis in uncomplicated cases, but the mortality rate in patients presenting with complications is high. In the developing world, mortality rates of 3-5% and higher are seen. Mortality rates and morbidity of the disease continue to be high due to several factors in developing countries. Among these factors, are occurrence of measles frequently under one year in these regions and bad environmental conditions, and can include secondary bacterial infections.⁴

The current study was planned to evaluate patients of measles with respect to their clinical and laboratory findings and complications.

Patients and Methods

The retrospective clinical trial was done at Yuzuncu Yil University, Hospital of Medical Faculty, Van, Turkey, between December 2012 and June 2013. After obtaining approval of the institutional ethics committee. Records of patients diagnosed with measles clinically and serologically and then hospitalised in the clinics of infectious diseases were retrieved.

Measles cases were confirmed using a standard case definition. A measles case is considered confirmed if it is laboratory-confirmed or meets the clinical case definition which comprises an illness characterised by a generalised rash lasting ≥ 3 days, a temperature of $\geq 101^\circ\text{F}$ [$\geq 38.3^\circ\text{C}$], and cough, coryza, or conjunctivitis and Koplik spots on first day. It is linked epidemiologically to a confirmed case. Laboratory confirmation of measles was made by detection in serum of measles-specific immunoglobulin M (IgM) level. IgM has sensitivity 96.7% and specificity 100% in diagnosing measles.⁴

Patients having measles complications were hospitalised and followed up in the clinic. Observed complications such as hepatitis, pneumonia, otitis media, laryngotracheitis, abortion, preterm labour, encephalomyelitis, lymphadenopathy, gastroenteritis,

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bronchitis, anaemia, thrombocytopenia and neutropenia were recorded.

Descriptive statistics for the investigated features were expressed as frequencies and percentages.

Results

Of the 50 records studied, 41(84%) related to women. Overall mean age was 25.52 ± 4.07 years (range: 18-33 years). The mean hospitalisation period was 6 ± 2.40 days. None of the patients had a prior history of measles. Anti-measles IgM antibody was positive in all the 50(100%) patients.

The most frequent symptoms observed were fever and rash in 50(100%), malaise 49(98%), cough 48(96%), headache 44(88%) and sore throat 36(72%). Koplik spots, the pathognomonic finding of measles, was positive in 3(6%) patients, lymphadenopathy existed in 6(12%) and hepatomegaly in 2(4%) patients (Table-1).

In laboratory examinations, thrombocytopenia was present in 26(52%) patients and liver transaminases

Table-1: Symptoms and physical findings of patients.

Symptoms & Signs	n (%)
Fever	50 (100)
Rash	50 (100)
Malaise	49 (98)
Sore throat	36 (72)
Headache	44 (88)
Redness in eye	17 (34)
Cough	48 (96)
Nausea-vomiting	21 (42)
Fever	50 (100)
Rash	50 (100)
Conjunctivitis	16 (32)
Koplik spot	3 (6)
Lymphadenopathy	7 (14)
Rales-roncus	9 (18)

Table-2: Laboratory findings.

Laboratory parameters	n (%)
Leukopenia ($< 4 \times 10^3$ /mL)	7 (14)
Anaemia (haemoglobin < 11 g/dl)	3(6)
Thrombocytopenia ($< 100 \times 10^3$ /mL)	26(52)
erythrocyte sedimentation rate > 20 mm/h	35(70)
C-Reactive Protein positivity > 5 mg/l	44(88)
ALT $>$ twice upper limit of normal	26(52)
AST $>$ twice upper limit of normal	23(46)

ALT: Alanin aminotransferase.

AST: Aspartat aminotransferase.

Table-3: Distribution of complications in patients.

Complications	n (%)
Hepatitis (ALT $>$ 10 times upper limit of normal)	4 (8)
Otitis media	9 (18)
Lymphadenopathy	6 (12)
Hepatomegaly	2 (4)
Pneumonia	9 (18)
Laryngotracheitis	6 (12)
Encephalomyelitis	1 (2)
Bronchitis	5 (10)
Gastroenteritis	1 (2)
Preterm labour	2 (13.3)
Abortion	3 (20)

elevation in 22(44%) (Table-2). Respiratory complications comprised pneumonia in 9(18%), bronchitis in 5(10%) and laryngotracheitis in 6(12%) and otitis media in 9(18%) patients (Table-3).

There were 15(30%) pregnant patients who were followed up in the clinic. Preterm labour was seen in 2(4%) and abortion was observed in 3(6%) patients respectively.

Appropriate antibiotic treatment was given to the patients where indicated, such as in complications suspected to be with bacterial origin, as well as symptomatic and supportive therapy. No mortality was seen.

Discussion

Although measles is a vaccine preventable disease, but it continues to be an important health problem worldwide. In Turkey, while vaccination against measles began in 1970, regular vaccination was initiated in 1985. Widespread use of the measles immunisation has led to a decrease in viral load circulating in society. Consequently, the incidence of measles infection at early ages has decreased and the number of individuals having antibodies below the preventable level in older ages has increased.⁵ Unfortunately none of our patients could give information about their prior measles vaccinations. Therefore, we could not get evidence about primary or secondary vaccine failure.

According to World Health Organisation (WHO) reports, some outbreaks have occurred in various countries in European region since 2005. In 2012, outbreaks or cases have been seen in a lot of countries such as Romania, Russia, Ukraine, Germany, Spain, Italy, Ireland, Belgium and in Turkey's neighbours Iran, Iraq and Syria. Due to the frequency of travellers from or to these countries, the risk of importation is increased.^{6,7} According to the data of Turkish Health Ministry, 18 measles cases have been

reported between 2007 and 2010. However, measles cases have been recorded as 111 from the beginning of 2010 up to 2011.⁸ The number of reported cases has increased at the end of 2012 and has led to an outbreak in the first 6 months of 2013 in Turkey.

The most frequent symptoms and clinical findings observed in our patients were similar to those reported in previous studies in which adult measles cases were evaluated.^{1-5,9-17} However, Koplik spots, the pathognomonic finding of measles, was positive only in 6% of our patients and lower than the studies cited above (38-100%). The low rate of Koplik spots in our study may be attributed to the fact that our patients had generally been admitted to other health centres at the beginning of the disease and later came to our hospital, which is a third-level health centre after a few days' delay. In laboratory examinations, thrombocytopenia was the most frequent complication in our cases. However, no severe thrombocytopenia which may lead to clinical haemorrhage was observed. Liver transaminases were elevated in 44% of our patients. Transaminase elevation has been reported in varying rates between 9% and 100% in other studies.^{5,9-19} The values more than 10 times the upper limit of the normal range in liver enzymes in the cases have been assessed in favour of viral hepatitis and this figure has been found as 8%. However, none of our patients showed bilirubin increase or cholestasis findings. Transaminase elevation is seen more frequently in adult age group rather than children in the reported studies and it has been postulated as that this condition may be considered as a common finding of measles in this age group.^{19,20} The self-limited course of the hepatitis without clinical findings and absence of correlation between the severity of the disease and liver transaminase elevation in these patients supports this opinion.

Leukopenia, being a frequent complication due to viral infections, was detected in 14% of our cases and our finding was consistent with previous reports.^{5,9-15,17,20} Leukopenia, which develops after measles infection, is accepted to be secondary to bone marrow suppression and leukopenia is related to the apoptosis in non-infected cells.²¹ Leukocyte counts of our cases returned to normal values within 2 weeks without any complications. Anaemia which was detected in 6% of our cases was not considered a complication because 42 of our 50 cases were females, and 15 of them were pregnant, and their laboratory values prior to measles infection were not known.

Fatal respiratory complications have been observed frequently in measles patients and reported in high rates.

Especially the epithelial damage and abnormal mucociliary clearance caused by either measles virus or secondary bacterial infections leads to debris accumulation in airways and alveoli. Pneumonia incidence due to measles has been reported between 2.4% and 26% in previous studies.^{5,9-12,14,22,23} In addition, any respiratory complication rates in adult measles cases have been found to be as high as 52%.¹⁶ The respiratory complications rates in our cases were consistent with literature.

Otitis media is a complication frequently observed, especially in children, in measles patients. In literature, the incidence of otitis media due to measles has been reported between 0.8% and 7%.^{5,9-11,14,15,22} In our study, the incidence of otitis media was significantly higher than earlier studies. This discrepancy might be attributable to the fact that our cases were selected patients for hospitalisation. Therefore, they had at least one complication in order to be hospitalised.

The incidence of gastroenteritis complication due to measles seen in adults has been reported between 12% and 85% in various studies. However, there are some case series in which no case of gastroenteritis was observed.^{5,9-14,16,22,24} This incidence rate of gastroenteritis complication was found to be 2% in our cases.

The incidence of encephalomyelitis, which is a mostly fatal complication of measles, has been reported between 0.3% and 9.5%.^{5,12,25} In a meta-analysis related to measles mortality, encephalomyelitis was observed to be associated with 11% of deaths.²⁶ Only one case of encephalomyelitis (2%) complication was seen in our study and no mortality was observed.

Although measles follows a severe clinical course in pregnant women, it does not result in congenital abnormality. However, measles virus causes a histological damage in placenta and has been reported to be able to result in some complications such as spontaneous abortion, premature delivery or stillbirth, at rate of 20% according to gestation week at which the mother suffers her measles.^{1,3,27} Two premature delivery and three abortion cases, out of 15 pregnant women were observed as complication in our study.

Conclusion

Measles continues to be an important health problem because of its complications large-scale epidemiological studies are needed in order to examine some critical issues such as primary and secondary vaccine failure, the spread of this disease despite the reported high rates of immunisation in Turkey.

References

1. Asaria P, MacMahon E. Measles in the United Kingdom: can we eradicate it by 2010. *BMJ* 2006; 333: 890-5.
2. Plotkin SL, Plotkin SA. Measles vaccine. In: Plotkin S, Orenstein W, Offit P, editors. *Vaccines*. 4th ed. Philadelphia: W.B. Saunders, 2004; pp 389-440.
3. Gershon AA. Measles virus. In: Mandell GL, Bennett JE, Dolin R, editors. *Principles and Practice of Infectious Diseases*. 5th ed. New York: Churchill Livingstone, 2000; pp 1801-9.
4. T.A. Willke, G. Söyletir, M. Doganay (Eds.), *Infectious diseases and microbiology*. 3th ed. Istanbul: Nobel Tip Publication, 2008; 1218-9.
5. Pahsa A, Özsoy MF, Altunay H, Kocak N, Yildirim A, Kocabeyoglu Ö, et al. Adult Measles: Retrospective evaluation of 284 cases. *Flora* 1999; 4: 200-5.
6. Muscat M, Bang H, Glismann S. Measles is still a cause for concern in Europe. *Euro Surveill* 2008; 13: 18837.
7. Information Note. Measles Science Advisory Board Resolutions. Ministry of Health Public Health Agency of Turkey, Ankara; 2013.
8. Basara BB, Güler C, Eryilmaz Z, Yentür GK, Pulgat E. *Health Statistics Yearbook 2011* the Directorate General for Health Research, Ministry of Health. Ankara; 2012
9. Celebi G, Piskin N, Aydemir H, Türkyilmaz R. Evaluation of 35 adult measles cases detected in a measles outbreak. *Mikrobiyol Bul* 2007; 41: 79-86.
10. Yaldiz F, Fincanci M, Yetiskul F, Nazlican Ö, Yigit U. Measles in adults: 66 patients of the epidemiological, clinical and laboratory features. *Klimik J* 1998; 11: 35-8.
11. Yayli G, Agalar C, Akhan G, Sözen H. Measles Outbreak Detection Evaluation of the 286 adult patients. *Infeks J* 2001; 15: 411-4.
12. Baykam N, Colpan A, Erbay A, Erdogan H, Dokuzoguz B. Clinical and Laboratory Evaluation of Adult Measles Cases. *Infeks J* 2001; 15: 415-8.
13. Erdem H, Pahsa A. A Joint Military Measles Outbreak; Regarding infrastructure, a Discussion. *Infeks J* 2004; 18: 307-10.
14. Dizbay M, Hizel K, Arman D, Senol E, Aktas F, Ulutan F. Measles in adults: Evaluation of Different Clinical Picture. *Klimik J* 2003; 16: 15-7.
15. Leibovici L, Sharir T, Kalter-Leibovici O, Alpert G, Epstein LM. An outbreak of measles among young adults. Clinical and laboratory features in 461 patients. *J Adolesc Health Care* 1988; 9: 203-7
16. Wong RD, Goetz MB. Clinical and laboratory features of measles in hospitalized adults. *Am J Med* 1993; 95: 377-83.
17. Giladi M, Schulman A, Kedem R, Danon YL. Measles in adults: a prospective study of 291 consecutive cases. *Br Med J (Clin Res Ed)* 1987; 295: 1314.
18. Mijiti MT, Sun H, Zhang Y. Analysis on clinical characteristics of adult measles inpatients in Urumqi Municipal. *Zhongguo Yi Miao He Mian Yi* 2009; 5: 516-7
19. Dinh A, Fleuret V, Hanslik T. Liver involvement in adults with measles. *Int J Infect Dis* 2013; 17: e1243-4
20. Lee KY, Lee HS, Hur JK, Kang JH, Lee BC. Clinical features of measles according to age in a measles epidemic. *Scand J Infect Dis* 2005; 37: 471-5.
21. Okada H, Kobune F, Sato TA, Kohama T, Takeuchi Y, Abe T, et al. Extensive lymphopenia due to apoptosis of uninfected lymphocytes in acute measles patients. *Arch Virol* 2000; 145: 905-20.
22. Dales LG, Kizer KW, Rutherford GW, Pertowski CA, Waterman SH, Woodford G. Measles epidemic from failure to immunize. *West J Med* 1993; 159: 455-64.
23. Bassetti M, Schenone E, Calzi A, Camera M, Valle L, Ansaldi F, et al. Measles outbreak in adults in Italy. *Infez Med* 2011; 19: 16-9.
24. Sniadack DH, Moscoso B, Aguilar R, Heath J, Bellini W, Chiu MC. Measles epidemiology and outbreak response immunization in a rural community in Peru. *Bull World Health Organ* 1999; 77: 545-52.
25. Buccoliero G, Lonerio G, Rollo MA, Romanelli C, Loperfido P, Cristiano L, et al. Hospitalization rate due to measles in an area of the South East of Italy during an outbreak in the years 2002-2003. *Minerva Pediatr* 2006; 58: 273-7.
26. Gindler J, Tinker S, Markowitz L, Atkinson W, Dales L, Papania MJ. Acute measles mortality in the United States, 1987-2002. *J Infect Dis* 2004; 189 Suppl 1: 69-77.
27. Anselem O, Tsatsaris V, Lopez E, Krivine A, Le Ray C, Loulergue P, et al. Measles and pregnancy. *Presse Med* 2011; 40: 1001-7.