MEDWIN PUBLISHERS
Committed to Create Value for Researchers

Virology & Immunology Journal
ISSN: 2577-4379

Measles: A Highly Infectious Viral Zooanthroponosis of Public Health Concern

Pal M*

Narayan Consultancy on Veterinary Public Health and Microbiology, India

***Corresponding author:** Mahendra Pal, Managing Director of Narayan Consultancy on Veterinary Public Health and Microbiology, India; Email: palmahendra2@gmail.com

Mini Review

Volume 8 Issue 2

Received Date: May 20, 2024

Published Date: June 13, 2024

DOI: 10.23880/vij-16000348

Abstract

Viral diseases, such as Nipah virus, Covid-19, monkeypox, swine flu, Hendra virus, avian influenza, rabies, yellow fever, Rift Vally fever, and others are important cause of morbidity as well as mortality in humans and animals worldwide. Measles is one most devastating viral disease that is responsible to infect around 20 million people globally every year. Measles virus is more infectious than influenza virus. The incidence of measles is higher in children than adults, and outbreaks of disease usually occur in early spring and late winter. Disease can spread rapidly unless the herd immunity is sustained. Hitherto, humans are known as the only natural host of measles, and can infect the monkeys. Clinical symptoms including cough, coryza and conjunctivitis are observed in most of the cases. Laboratory tests, such as immunofluorescence, virus isolation, immunological and molecular tools can be useful to make an unequivocal diagnosis of disease. Since there are no antiviral chemotherapeutic agents are available to treat the sick persons, immunization is the mainstay to control the disease as it provides a lasting immunity of about two decades.

Keywords: Children; Epidemic; Immunization; Measles; Public Health; Zoonosis

Introduction

Zooanthroponoses (reverse zoonoses) are the infectious diseases, such as poliomyelitis, measles, infectious hepatitis, influenza A (H1N1), *Mycobacterium tuberculosis, Streptococcus pneumonia,* methicillin resistant *Staphylococcus aureus* (MRSA). *Trichophyton rubrum, Candida albicans, Entamoeba histolytica, Giardia duodenalis, Cryptosporidium parvum, Ascaris lumbricoides*, and *Trichuris trichura*, which are transmitted from humans to animals [1,2]. Measles also known as Hard measles, Morbili, Red measles, Rubeola, is an important highly contagious viral disease of global public health concern, and is caused by measles virus (RNA genome) that belongs to the genus *Morbillivirus* and family *Paramyxoviridae* [1]. The virus can be easily inactivated by ultraviolet rays, heat, and formaldehyde, and can be grown in monkey kidney cells and human amnion. The measles virus shares the antigen with bovine rinderpest and canine distemper [3]. The respiratory tract or conjunctiva are recognized as the portal of entry of virus to the body of the host. The spread of virus to the reticuloendothelial system occurs through blood [3].

Measles is worldwide in distribution, and outbreaks of disease has been described from many nations, such as Indonesia, Philippines, China, Romania, Madagaskar, Democratic republic of Congo, and others [1,4-6]. In addition to humans, measles virus infection has been reported in langur, marmoset, monkey; antibodies in chimpanzee, gibbon, and orangutan [1,3]. In this context, Wily and co-

investigators reported an outbreak of measles among Old World non-human primates in the USA [7]. There are evidences to believe that monkeys acquire the infection from humans [1]. The present communication delineates the public health significance of measles, a highly infectious viral zooanthroponosis.

Transmission

Measles can be transmitted through several ways [1].

1. Droplet spread secretions from throat and nose of sick patient.
2. Direct contact with infected secretions, urine, or soiled articles.
3. Person-to-person transmission through airborne route.
4. Conjunctiva can also act as a portal of entry of the virus.
5. Human can transmit measles virus to the non-human primates.

Symptoms

Humans: The incubation period of disease is 7 to 10 days [5]. There is sudden rise of temperature, coryza, conjunctivitis, cough, hoarseness, laryngitis, pharyngitis, bronchitis, and stomatitis. Koplik's spots are observed on the buccal mucosa [1,5]. There is reddish brown maculopapular rash on the face, and later becomes generalized. In few cases complications, such as encephalitis, otitis and pneumonia occur. In addition, subacute sclerosing panencephalitis (SSPE) are noticed in children of 4-10 years following a natural attack of measles [1]. It is more severe in undernourished children, and death can occur due to secondary pneumonia. Disease affects generally children and those adults who are not exposed earlier [1]. It is pertinent to mention that Koplik's spot is considered as a pathognomic sign of measles virus infection [8,9].

Animals: Animals may remain asymptomatic, and can show the signs of rhinitis, dry cough, pneumonia, conjunctivitis, maculopapular eruption and desquamation [1].

Diagnosis

The virus can be isolated from blood, urine, pharyngeal washing, conjunctival swab, nasal secretion on primary human kidney cell culture, and monkey cell line (Vero) [1]. Smear prepared from the nasal swab may be examined to detect virus antigen by immunofluorescence technique [3]. Immunological methods (complement fixation, hemagglutination inhibition), and molecular test (reverse transcriptase PCR) are also helpful in the diagnosis of measles [3].

Treatment

Presently, no specific antiviral therapy is available. However, supportive therapy that includes complete bed rest, cough linctus, paracetamol, antibiotics, fluid intake, and eye wash with boric powder are advised in the management of disease [1]. It is emphasized that sincere attempts should be made to develop safe, effective, and low-cost drug that can be easily affordable by the poor resource nations for the treatment of measles.

Control

Measles is a terrible disease that can be eliminated through proper vaccination. Active immunization of children with live attenuated measles virus vaccine and passive immunization of contact, debilitated patient with gamma globulin is essential [1]. Strict isolation of primates in individual cages is advised. The people who are attending primates must wear face mask and protective clothing. Sanitary disposal of all secretions and discharges from sick person is required to prevent the spread of infection [1].

It is important to educate to physician and health department worker about the use of vaccine to all susceptible infant and children [1].

Conclusion

Measles is a highly contagious disease that primarily affects the children, and is reported from many countries of the world including India. It causes disability and deaths of millions of children globally. Koplik's spot that occurs primarily on the buccal mucosa, is an important symptom of measles. RT-PCR and virus isolation can be employed to establish the diagnosis of disease. Immunization remains the mainstay of control of measles viral infections. Further research on the development of safe, cheap and effective chemotherapeutic agent and potent vaccine may be rewarding.

References

1. Pal M (2007) Zoonoses. 2nd (Edn.), Satyam Publishers, Jaipur, India.
2. Messenger AM, Barnes AN, Gray GC (2014) Reverse zoonotic disease transmission (zooanthroponosis): A systematic review of seldom documented human biological threats to animals. PLOS ONE 9(2): e89055.
3. Kanungo R (2016) Ananthanarayan and Paniker's Textbook of Microbiology. (10th Edn), Universities Press, Hyderabad, India.
4. Kumar D, Sabella C (2016) Measles: back again. Cleveland Clinical Journal of Medicine 83(5): 340-344.
5. Husada D, Kusdwijono, Pupitasari D, Kartina L, Basuki

PS, et al. (2020) An evaluation of the clinical features of measles virus infection for diagnosis in children within a limited resource setting. BMC Pediatrics 20(1): 5.

6. Domai FM, Agruis KA, Han SM, Sayo AR, Ramirez JS, et al. (2022) Measles outbreak in the Philippines: epidemiological and clinical characteristics of hospitalized children, 2016-2019. The Lancet Regional Health Western Pacific 19: 100334.

7. Wiley ME, Woodsward RA, Thoronton VB, Wolf AV, Fynn BM, et al. (1999) Management of measles outbreak among Old Word nonhuman primates. Laboratory Animal Science 49(1): 42-48.

8. Perry RT, Halsey NA (2004) The clinical significance of measles: a review. Journal of Infectious Diseases 189(Suppl 1): S4-S16.

9. Zenner D, Nacul L (2012) Predictive power of Koplik's spot for the diagnosis of measles. Journal of Infection in Developing Countries 6(3): 271-275.