

Measles a Highly Contagious Viral Infection and its Antibody Vaccination Therapy

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DESCRIPTION

Measles, a highly contagious viral infection, has been a global health concern for decades due to its potential for widespread outbreaks and severe complications. The disease is caused by the measles virus, a member of the paramyxovirus family, primarily transmitted through respiratory droplets or direct contact with an infected person. The infection starts with nonspecific symptoms like fever, cough, runny nose, and conjunctivitis, followed by a characteristic red rash. One of the critical aspects of measles is its ability to spread rapidly among unvaccinated populations. Its contagious nature and potential for complications like pneumonia, encephalitis, and even death make prevention a vital strategy. Vaccination has been the cornerstone in controlling and preventing measles outbreaks. The measles vaccine, typically given as the MMR (measles, mumps, rubella) vaccine, has significantly reduced the incidence of measles worldwide.

The vaccine works by introducing a weakened or inactivated form of the virus into the body, triggering the immune system to produce antibodies without causing the disease. These antibodies are specific proteins that target the measles virus, marking it for destruction by immune cells. Upon subsequent exposure to the actual virus, the immune system "remembers" and mounts a swift response, producing a higher level of antibodies to combat the infection before it causes significant illness.

However, despite the availability of the vaccine, some communities face challenges in achieving high vaccination coverage due to various factors. Vaccine hesitancy, lack of access to healthcare, misinformation about vaccine safety, and logistical difficulties in reaching remote areas all contribute to lower immunization rates in certain populations. These pockets of under-vaccinated individuals create opportunities for measles outbreaks to occur, putting both unvaccinated individuals and those with compromised immune systems at risk.

In response to outbreaks or in high-risk populations, antibody therapy, also known as passive immunization, can be used as a preventive measure or a treatment option. This therapy involves

administering pre-formed antibodies obtained from individuals who have recovered from measles or manufactured antibodies specifically targeting the measles virus. These antibodies provide immediate but temporary protection by neutralizing the virus and aiding in its clearance from the body. Passive immunization is particularly beneficial for individuals who have been exposed to measles but have not been vaccinated or do not have sufficient immunity.

Passive immunization is also crucial for certain groups who cannot receive the measles vaccine due to medical reasons, such as individuals with weakened immune systems or severe allergies to vaccine components. For these individuals, receiving a dose of measles antibodies can offer short-term protection against the virus. While antibody therapy can be effective in providing immediate protection, it does not confer long-term immunity like the vaccine does. Its effects wane over time, leaving individuals susceptible to subsequent exposures. Therefore, it serves as a temporary solution or an emergency measure in controlling outbreaks or protecting vulnerable populations until more comprehensive vaccination strategies can be implemented.

Combining vaccination efforts with public health measures such as surveillance, rapid outbreak response, and education about the importance of immunization remains crucial in achieving measles elimination goals. Strengthening healthcare systems to ensure vaccine accessibility, addressing vaccine misinformation, and fostering community engagement are essential steps toward achieving high vaccination coverage and preventing measles resurgence. Measles remains a significant public health concern despite the availability of an effective vaccine. Vaccination stands as the most effective and sustainable strategy to prevent measles infections and outbreaks. However, in specific situations where vaccination is not feasible or where immediate protection is needed, antibody therapy serves as a valuable tool in providing temporary immunity. Nonetheless, a comprehensive approach that emphasizes vaccination as the primary preventive measure coupled with robust public health initiatives is key to reducing the global burden of measles and safeguarding vulnerable populations from its potentially severe consequences.

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Received: 30-Oct-2023, Manuscript No. JADPR-23-28710; **Editor assigned:** 02-Nov-2023, Pre QC No. JADPR-23-28710 (PQ); **Reviewed:** 16-Nov-2023, QC No. JADPR-23-28710; **Revised:** 23-Nov-2023, Manuscript No. JADPR-23-28710 (R); **Published:** 30-Nov-2023, DOI: 10.35841/2329-8731.23.11.336

Citation: Tuon F (2023) Measles a Highly Contagious Viral Infection and its Antibody Vaccination Therapy. *Infect Dis Preve Med.* 11:336.

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