MedCrave
Step into the World of Research

Journal of Human Virology & Retrovirology

Mini Review

Open Access

CrossMark

Pertinence of immune waning in measles virus infection – a short review

Abstract

A striking occurrence will mark an acute infection with the measles virus. The patient soon acquires a lifelong specific immunity to the virus. But, unexpectedly, a transient cellular immune deficiency takes place as well, for several months. The causes of this paradox have not been entirely elucidated. An atypical measles syndrome was scrutinized in order to evaluate the immune status of patients who developed this disorder, subsequently to the administration of the formalin inactivated measles virus vaccine. Although considered not to occur in classic measles, an immune waning develops, at least, in atypical measles syndrome.

Keywords: measles virus, permanent immunity, immune deficiency, immune waning, atypical measles syndrome

Volume 8 Issue 1 - 2020

Daniel Benharroch
Department of Pathology, Soroka University Medical Centre and Faculty of Health Sciences, Ben-Gurion University of the Negev, Israel

Correspondence: Prof. Daniel Benharroch, Department of Pathology, Soroka University Medical Centre, Rager Blvd, P.O.Box 151, Beer-Sheva 84101, Israel, Tel 972-507579140, **Email** danielbenharroch1@gmail.com

Received: February 07, 2020 | **Published:** February 25, 2020

Abbreviations: MV, measles virus; AMS, atypical measles syndrome; FMIV, formalin inactivated MV

Introduction

Measles invariably leads to a permanent immunity to the virus. Measles virus vaccination is reported to provide also long term immunity, most probably in the absence of endemic measles virus (MV) transmission. Rates of MV vaccination should reach more than 95%, in order to secure herd immunity.[1]

Nevertheless, immune deficiency develops regularly, in spite of a lifelong specific immunity to the virus. Two notions add some confusion onto the concept of human protection against the MV. By "immune waning" it is understood that immunity to MV gradually diminishes, spontaneously or otherwise. A majority of relevant studies exclude this occurrence in classic measles.[2] Two publications are cited, which underline the hazy boundary between classic measles and atypical measles syndrome (AMS), as they relate to immune waning. It remains to confirm that a two-dose MMR vaccine has indeed been provided.[3,4]

"Secondary vaccine failure" has referred, among others, to vaccination with the live attenuated MV, as it is followed by the incidence of AMS.[5,6] The AMS differs by major features from typical measles. The AMS is a rare disorder, now even more infrequent, at least apparently. This disorder affects older patients, showing a polymorphous rash, involving specifically hands and feet; pulmonary nodules; functional hepatic disturbances; prolonged fever and Koplik spots that persist for 7 days or more. This disease, first described in 1963, followed vaccination with a formalin inactivated MV (FMIV) vaccine. The subsequent exposure to wild-type MV seemed necessary for AMS to occur. The FMIV conferred protection which lasted a few months, but was followed by an abrupt drop of titers. In AMS, anti-MV antibody titers are about 1:160, which is rare in typical measles.[7,8]

To underline the ease by which the diagnosis of AMS can be missed, an article is cited, which describes 291 soldiers diagnosed as suffering from measles. The patients were young adults with abdominal pain, diarrhea and vomiting (33%); Koplik spots that lasted about 7 days; abnormal liver function tests (86%). The diagnosis of AMS in most or all the cohort was probably missed. The type of the anti-MV vaccine used prior to the event was not identified.[3]

In 2015, Levine et al reported the status of the MV immunity, 20 years after the two-dose MMR vaccine was introduced. In 1996, 95.6% of the cohort had shown positive MV antibodies, while in 2007, these positive results had dropped to 85%. In this report, one is probably dealing with the development of a state of waning immunity.[4] Since several events involving the immune system have occurred, driving the network to various, often conflicting directions, the mechanism delineating the effect of the MV is poorly characterized.

Conclusion

A number of events, mostly of immune nature and often showing discordant trends, may result from infection or vaccination with the MV. One of the consequences seems to involve the development of waning immunity, but, whether this occurrence concerns also classic measles, is controversial.[2]

Acknowledgments

Thanks to Kibbutz Sde-Boker for the opportunity.

Funding

No funding.

Conflicts of interest

The author declares no Conflicts of interest.

References

1. Knipe DM, Howley PM, Griffin DE. Fields Virology, 5th ed, Philadelphia: Wolters Kluwer/Lippincott, Williams and Wilkins, Publishers. 2007.

©2020 Benharroch. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and build upon your work non-commercially.

2. Kontio M, Jokinen S, Paunio M, et al. Waning antibody levels and avidity: implications for the MMR vaccine-induced protection. *JID*. 2012;206(10):1542–1548.

3. Giladi M, Shulman A, Kedem R, Danon YL. Measles in adults: a prospective study of 291 consecutive cases. *BMJ*.1987;295(6609):1314.

4. Levine H, Zarka S, Ankol OE, et al. Seroprevalence of measles, mumps and rubella, among young adults, after 20 years of universal two-dose MMR vaccination in Israel. *Hum Vaccin Immunotherapy*. 2015;11(6):1400–1405.

5. Rauh LW, Schmidt R. Measles immunization with killed virus vaccine. Serum antibody titers and experience with exposure to measles epidemics. *Am J Dis Child*. 1965;109:232–237.

6. Griffin DE, Pan CH. Inactivated vaccines. In: Griffin DE, Oldstone MBA, editors. *Measles, pathogenesis and control*. Berlin: Springer; 2009. p. 194–195.

7. Melenotte C, Cassir N, Tessonier L, et al. Atypical measles syndrome in adults: still around. *BMJ Case Rep*. 2015.

8. Benharroch D. Atypical measles syndrome - a brief review. *Ann Clin Cytol Pathol*. 2016;2:1039–1041.

9. Wood DL, Brunell PA. Measles control in the United States: problems with the past and challenges for the future. *Clin Microbiol Rev*. 1995;8(2):260–267.

Citation: Benharroch D. Pertinence of immune waning in measles virus infection – a short review. *J Hum Virol Retrovirology.* 2020;8(1):7–8.
DOI: 10.15406/jhvrv.2020.08.00213