



Letter to the Editor

Herd immunity and primary immune deficiencies

Albert Farrugia^{a,*}, Isabella Quinti^b^a School of Surgery, Faculty of Medicine and Surgery, The University of Western Australia (M509), 35 Stirling Highway, 6009 Crawley, Australia^b Department of Molecular Medicine, Sapienza University of Rome, Rome, Italy

ARTICLE INFO

Article history:

Received 24 August 2018

Received in revised form 27 September 2018

Accepted 20 November 2018

Available online 26 November 2018

Keywords:

Measles
Immune deficiency
Vaccination

ABSTRACT

This letter addresses the issues adjoining the article by Bernadou et al. Measles outbreak linked to insufficient vaccination coverage in Nouvelle-Aquitaine Region, France, October 2017 to July 2018. *Euro Surveill.* 2018;23(30):pii = 1800373. <https://doi.org/10.2807/1560-7917.ES.2018.23.30.1800373>. The decreased vaccination rates against measles are decreasing herd immunity to this agent, posing a risk for patients with Patient Immune Deficiency as the measles antibody titre decreases in products used to provide prophylactic cover against this illness.

© 2018 Elsevier Ltd. All rights reserved.

The report from Datta et al. [1] is an important historical description of the progress in eliminating measles and rubella in Europe, although it needs to be augmented by the World Health Organization's report of 20 August 2018 indicating a decreasing herd immunity against this virus in the European region [2]. We would like to propose to the authors that the inclusion of patients with Primary Antibody Deficiency (PAD) and other immune-compromised patients in their consideration of the vulnerable population groups affected merits consideration. These patients lack the ability to produce adequate levels of functional antibodies, leaving them subject to increased morbidity and mortality from infectious pathogens. Regular prophylactic replacement therapy with plasma-derived polyclonal immunoglobulin preparations has enhanced considerably the expectancy and quality of life in these patients.

In recent years, variation in the concentrations of specific antibodies against Hepatitis A Virus and Hepatitis B Virus, pneumococcal polysaccharides, measles, diphtheria, polio viruses and other pathogens in the immunoglobulin products have been described [3]. These differences, reflecting the natural occurrence of various infections and the immunogenicity of vaccines in the plasma donors, account for the fluctuations of antibody titers related to the countries of origin of the immunoglobulin products and may result in sub-optimal clinical outcomes in PID patients [4].

In particular, the anti-measles titer in immunoglobulin products, a mandatory regulatory requirement, has come under scrutiny as measles antibody levels in the plasma donors contributing to the immunoglobulin product have decreased following

the introduction of mass vaccination [5]. This has led to proposals that the specified content of anti-measles antibody be decreased in order to ensure continued adherence to the specification and immunoglobulin product release.

Hence, the protective effect of the main therapeutic modality for immune deficient patients may be decreasing in efficacy, and any measure which decreases herd immunity in the normal population, including possible measures decreasing mandatory vaccination in Italy, which may precipitate outbreaks of infections, will put PID patients at risk of substantial morbidity. We encourage the authorities of countries, such as Italy, with suboptimal herd immunity levels of protection, to maximize their effort to potentiate their vaccination policy to protect this group of vulnerable patients, and all investigators such as Datta et al. [1] to reflect this concern in their assessments of the progress of vaccination policy globally. Declining anti-measles titers in immunoglobulin products is an important topic, both in connection with decreasing vaccination in the population as antibody titers after measles are much higher than antibody titers after vaccination, and even more so after incomplete or lack of vaccination in the population of blood donors. For this reason, regional differences between immunoglobulin products are likely to increase, accentuating the desirability of sourcing plasma for such products from the same geographical area where the patients using these products are located.

Conflict of interest statement

Albert Farrugia provides compensated services to the manufacturers of immunoglobulin therapies.

* Corresponding author.

E-mail address: Albert.farrugia@uwa.edu.au (A. Farrugia).

Funding statement

None.

References

- [1] Datta SS, O'Connor PM, Jankovic D, Muscat M, Ben Mamou MC, Singh S, et al. Progress and challenges in measles and rubella elimination in the WHO European Region. *Vaccine* 2018;36(36):5408–15.
- [2] World Health Organization. Measles cases hit record high in the European Region. Available from: <<http://www.euro.who.int/en/home/copyright-notice>> [Internet, cited 2018 Aug 17].
- [3] Lee Soyoung, Kim Han Wool, Kim Kyung-Hyo. Antibodies against Hepatitis A and Hepatitis B Virus in intravenous immunoglobulin products. *J Korean Med Sci* 2016;31(12):1937–42.
- [4] Kaplan LJ, Daum RS, Smaron M, McCarthy CA. Severe measles in immunocompromised patients. *JAMA* 1992;267(9):1237–41.
- [5] Modrof J, Tille B, Farcet MR, McVey J, Schreiner JA, Borders CM, et al. Measles virus neutralizing antibodies in intravenous immunoglobulins: is an increase by revaccination of plasma donors possible? *J Infect Dis* 2017;216(8):977–80.