Patients cured of Ebola virus disease: rapid decline in antibody levels in patients treated with monoclonal antibodies

Press release | Marseille, December 1, 2023

Certain treatments to combat the Ebola virus, notably those based on monoclonal antibodies[1], have increased the survival rate of patients suffering from the disease and are now recommended. Researchers from IRD, Inserm, ANRS | Emerging Infectious Diseases and INRB, have evaluated, for the first time, the antibody response in survivors of the tenth Ebola epidemic in the Democratic Republic of Congo (DRC) who received specific drugs against the virus. This study of the "Ebola Victors" cohort was initiated as part of the French response to the Ebola epidemic, and was part of the Franco-Congolese roadmap signed by the Congolese and French presidents. Its results, published on November 30 in *The Lancet infectious Diseases*, show that monoclonal antibodies could have a negative impact on the production of anti-Ebola antibodies over time, potentially increasing the risk of reinfection or reactivation.

Ebola virus disease is a serious infection with a lethality rate ranging from 30% to 90% in the absence of treatment. Between 2018 and 2020, in the provinces of North Kivu, South Kivu and Ituri (DRC), the tenth Ebola epidemic was the longest and deadliest ever recorded to date in the country, and the second largest in the world, after the 2013-2016 epidemic in West Africa.

The experience gained from previous epidemics has led to the adoption of preventive measures and the implementation of new strategies to combat the virus. As a result, specific anti-Ebola drugs, in particular monoclonal antibodies, have improved patient care and survival. In this study, to better understand the long-term effects of these treatments, researchers assessed the humoral immune response[2] in survivors treated with anti-Ebola drugs during the tenth Ebola epidemic in the DRC.

Participants in the observational study, "Ebola Victors", were recruited on the day of discharge from the Ebola Treatment Center (ETC) and followed for up to 12 months. Of the 787 survivors included in the study, the researchers studied the antibody response of 358 of them: on discharge, almost a quarter were seronegative for at least two antigens of the virus. Those who had received specific anti-Ebola treatments, in particular monoclonal antibodies (Ansuvimab), experienced a rapid decline in their antibody levels to the virus over time. These results raise many questions, notably concerning the impact of these antibodies on viral persistence in privileged immune sites, with a risk of relapse or persistent clinical manifestations (sequelae), and also on the risk of reinfection in these patients.

This study underlines the need for further research into the human reservoir of the Ebola virus, in order to better understand the factors involved in the persistence and resurgence of the virus, and thus develop drugs capable of eradicating it. From a public health point of view, it is important to continue monitoring people declared cured of Ebola virus infection, and to discuss the advisability of vaccinating them to help prevent any resurgence or reinfection. Finally, this study illustrates the importance of interventions during epidemic periods, combining three essential actions: care, research and the ability of teams to mobilize.

[1] antibodies manufactured specifically to treat a disease

[2] is characterized by the excretion in the serum of antibodies specific for a given antigen.

Reference

Antoine Nkuba-Ndaye, Angele Dilu-Keti, Tamara Tovar-Sanchez, Mamadou Saliou Kalifa Diallo, Daniel Mukadi-Bamuleka, Richard Kitenge, Pierre Formenty, Anaïs Legand, François Edidi-Atani, Guillaume Thaurignac, Raphael Pelloquin, Placide Mbala-Kingebeni, Abdoulaye Toure, Ahidjo Ayouba, Jean-Jacques Muyembe-Tamfum, Eric Delaporte, Martine Peeters, Steve Ahuka-Mundeke.

Impact of Anti-Ebola virus monoclonal antibodies on endogenous antibody production in Ebola virus disease survivors in the Democratic Republic of the Congo: an observational cohort study, *The Lancet infectious Diseases*, November 30, 2023.

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Inserm is the only French public research organization entirely dedicated to health. Our aim is to advance knowledge of living organisms and diseases, and to develop innovation to improve the health of all.
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About ANRS | Emerging Infectious Diseases

ANRS | Emerging Infectious Diseases, created on January 1, 2021 and headed by Professor Yazdan Yazdanpanah, is an autonomous agency of Inserm under the supervision of the Ministry of Higher Education and Research and the Ministry of Health and Prevention. Its mission is to lead, evaluate, coordinate and fund research into HIV/AIDS, viral hepatitis, sexually transmitted infections, tuberculosis and emerging and re-emerging infectious diseases (including emerging respiratory infections such as COVID-19, viral hemorrhagic fevers and arboviroses).
https://anrs.fr/

About INRB

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[2] is characterized by the excretion in the serum of antibodies specific for a given antigen.

The Institut National de Recherche Biomédicale (INRB), founded in 1984, is a public institution. It has been a World Health Organization (WHO) collaborating center since 2018, headed by Professor Jean-Jacques Muyembe Tamfum. It serves as the national public health laboratory for the Ministry of Public Health, Hygiene and Prevention of the Democratic Republic of Congo (DRC). INRB is a multidisciplinary institute with thirty years' experience in the identification, treatment and prevention of priority infectious diseases in the DRC. Its core activities include medical and biological analysis, applied and translational research, communicable disease surveillance and the promotion of professional growth and development. INRB has continually developed and trained top-quality researchers and produced outstanding results, most recently in concrete control, prevention and research efforts in the context of the recent Ebola and Coronavirus epidemics.

https://inrb.net/

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