Predicting HIV treatment response in Romania – Comment

Maja Stanojević,[1] Djordje Jevtović,[2] Gordana Dragović[3]*

In recent years mathematical modeling has become a valuable tool in the analysis of infectious disease dynamics at both individual and population level. Mathematical models allow us to extrapolate from current information about the natural history of a disease, therapy/intervention outcome, state and progress of an outbreak, to predict the future and, most importantly, to quantify the uncertainty in these predictions, thus, increasingly gaining the ability to perform as a link between basic science, clinical medicine and public health. With the current technological and computational power it is tempting to build very complex models in order to fit the data the most. However, models are only as good as the data they are trained on and supplied with, making predictions based on limited information very difficult and unreliable.[1] The study presented by Revell et al. actually manages to overcome lack of information and still provide plausible predictions.[2] This does seem very promising for countries with limited resources, such as the case is with Serbia.

The time of the initial identification of the HIV-1 epidemics in Serbia is comparable to that in West European countries, and so is the timeline of introduction of antiretroviral therapy (ART) use.[3] However, the healthcare system and infrastructure in the country have been severely challenged during the last decades, suffering from the lack of financial resources, equipment and supplies, which is particularly reflected in the field of HIV treatment. Thus, supply of drugs was periodically irregular and unreliable, introduction of new ARV drugs rather late and inefficient, as was the access to state of the art laboratory monitoring. HIV-1 epidemics in Serbia is largely caused by subtype B, thus the issue of viral subtype is not as relevant as in Romania, however, important clinical parameters such as CD4 cell count or viral load are lacking.

In Serbia, there are 4 centers for the management and treatment of HIV/AIDS patients. The largest Serbian center where over 915 HIV/AIDS patients (over 85% of the total patient population in Serbia) are being treated is situated at the University Infectious Diseases Hospital in Belgrade. In those centers, especially in the one in Belgrade, doctors are facing with long periods of time with no completely available HAART monitoring tools. [4] Precisely, CD4 cell count has been not available, and less often plasma viral load could not be measured. HIV resistance testing has not become an everyday routine yet. Our prospective follow-up study of all HIV positive, drug-naive individuals who started antiretroviral treatment between January 1st 2003 and June 1st 2011 has shown that among patients with over 9 months of follow-up, the frequency of CD4 monitoring had a median (IQR) of 1 (IQR 1, 2) measurements in the first year of ART with an average of 2 (IQR 1, 3) CD4 tests per year. The frequency of plasma viral load monitoring had a median (IQR) of 1 (IQR 0, 2) measurements in the first year of ART with an average of 1 (IQR 1, 2) plasma viral load tests per year (unpublished data).

For those patients who experience virological failure and when resistance testing is not

Received: 21 February 2011; accepted: 23 February 2012

[1]MD, PhD, National Retrovirus Reference Laboratory, University of Belgrade Faculty of Medicine, Belgrade, Serbia; [2]MD, PhD, Institute of Infective and Tropical Disease 'Dr Kosta Todorović', Professor, School of Medicine, University of Belgrade, Bulevar oslobodjenja 16, 11000 Belgrade, Serbia; [3]MD, PhD, Institute of Pharmacology, Clinical Pharmacology and Toxicology, Associate Professor, School of Medicine, University of Belgrade, Dr Subotica 1/III, P.O. Box 38; 11000 Belgrade, Serbia

*Corresponding author: Gordana Dragović, MD, PhD, Institute of Pharmacology, Clinical Pharmacology and Toxicology, Associate Professor, School of Medicine, University of Belgrade, Dr Subotica 1/III, P.O. Box 38; 11000 Belgrade, Serbia, gozza@beotel.net

Article downloaded from www.germs.ro
Published on 1 March 2012
© GERMS 2012
ISSN 2248 – 2997
ISSN – L = 2248 – 2997

available, doctors relay on the standard of care practice. That means considering all possible antiretroviral drugs cross-resistance and changing the combination accordingly. Having in mind these circumstances, it would be very useful to test the reliability of HIV Resistance Response Database Initiative (RDI) method to assess the current Serbian practice using only baseline viral load and the viral load after the change of antiviral combination, regardless of the CD4 cell count.

Conflicts of interest All authors – none to declare.

Authors' contributions All authors had equal contributions.

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Please cite this article as:
Stanojević M, Jevtović D, Dragović G. Predicting HIV treatment response in Romania – Comment. GERMS. 2012;2(1):23-24