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Tackling resistance in infectious diseases

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Antibiotic resistance is regarded as a major threat to global public health, to the extent that medicine could be on its way “back to the future” of a pre-antibiotic era. The issue is receiving high-level political attention, with resolutions passed at events such as the G7 Health Ministries summit and the European Parliament, the endorsement by the WHO of the AMR Global Action Plan, and culminating at the United Nations High-Level Meeting on AMR and the adoption of its declaration by the UN General Assembly. The list was drawn up in a bid to guide and promote research and development (R&D) of new antibiotics, as part of WHO's efforts to address growing global resistance to antimicrobial medicines. The list highlights in particular the threat of gram-negative bacteria that are resistant to multiple antibiotics. These bacteria have built-in abilities to find new ways to resist treatment and can pass along genetic material that allows other bacteria to become drug-resistant as well. (27th February 2017, WHO) meantime Tuberculosis (omitted from the list) and resistant tuberculosis in particular (MDR/XDR) merits interest for rapid, affordable, easy diagnostic, innovative immunology approach for vaccine research. HIV/AIDS has known link with tuberculosis but other risk factors have also emerged in recent years as important determinants of the TB epidemic, one of which is diabetes mellitus. Bacille Calmette – Guérin (BCG) vaccine successfully helped to interrupt transmission cycle and along with antibiotic discovery to decrease mortality. BCG has been used for more than 90 years with astonishing safety records. However, its efficacy remains controversial. No universal BCG vaccination policy exists, with some countries merely recommending its use and others that have implemented immunization programs. XDR tuberculosis has evolved in several tuberculosis-endemic countries to drug-incurable or programmatically incurable tuberculosis (totally drug-resistant tuberculosis). Of note that HIV/AIDS has known link with tuberculosis but other risk factors have also emerged in recent years as important determinants of the TB epidemic, one of which is diabetes mellitus. This poses several challenges similar to those encountered in the pre-chemotherapy era, including the inability to cure tuberculosis, high mortality, and the need for alternative methods to prevent disease transmission. Another issue is reappearing of “old diseases” like pertussis, measles but meantime existence of viral or parasitic diseases resistant to current treatment (HIV, Malaria, Hepatitis C) underline important role of adapted immunization as one of strong tool with large impact along with role of effective diagnostic and surveillance and better understanding of genetic and immunologic background of host specific response and pathogen evolution. Additionally, risk or new emerging and re-emerging pathogens originated from animals after having crossed the species barrier underline importance to implement preventive and intervention strategies including boosted vaccine research and development. Immunology and deep understanding (along with genetics) and lesson learned from oncology research helps to orientate vaccine research for improved delivery (use of sIgA as mucosal vaccine vehicle for example applicable for live attenuated vaccines), vectors (live attenuated, recombinant virus vectored vaccines and to look at host improved innate and adaptive immune response (APC – DC, CD4/CD8) to combined major pathogens and development of “universal vaccines”. Know limitations for use of anti-infectives and antivirals anti-parasitic treatments such as comorbidities, potential drug toxicity, disease related organ dysfunctions, drug-drug interactions and overlapping toxicities, pill burden, particularities of children population and immune reconstitution inflammatory syndrome support role of vaccines as highly potent tool to tackle resistance and valuable alternative from long term perspective and clearly recognized being major tool for public health.

Biography

Ivana Haluskova Balter is a Medical and cosmopolitan professional specialised in infectious diseases, internal medicine covering various therapeutic axes, certified in Immunology and Pediatric, MBA vaccinology and years of clinical practise contributing to bring innovative science and diplomacy for global health.

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