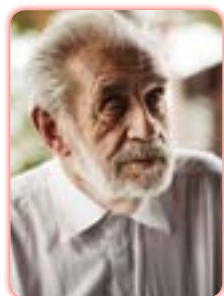


Antimicrobials, Multiple Drug Resistance & Antibiotics Resistance

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The eco-shadow concept: A holistic approach for evaluation of adverse effects regarding usage of antimicrobials

In the present setting, the term eco-shadow is defined as future alterations in an ecosystem following exposure of the ecosystem to antimicrobial agents. The alterations can be of variable length and can involve variations in numbers and functions of species/strains as well as development of resistance to such agents. In the past, most attention has been paid to development of antibiotic resistance following exposure of microorganisms to antibiotics. Nowadays, it is a rapid body of evidence showing that usage of any antimicrobial may lead to development of resistance and spreading of resistant microbial strains. Groups of substances studied to a certain degree include disinfectants, herbicides, pesticides, food additives, genetic modified organisms (GMOs) (depending on how they are produced), many heavy metals and even probiotics. Most often, the new resistance is found on plasmids, often rapidly coupled with resistance to commonly used antibiotics. Thus, usage of a disinfectant or an herbicide might be driving forces in a rapid spreading of resistance to clinically important antibiotics. Therefore, our fight against increasing antibiotic resistance cannot any longer be restricted to a more controlled usage of genuine antibiotics but has to include a similar usage control of all antimicrobials. Additionally, new approaches have to be taken into considerations and focus has to be put on spreading mechanisms. Cleansing of sewage will include eradication of antibiotic resistant genes, feces transplants have to be controlled for absence of defined gene resistance, etc. This is not science fiction, but technologies under establishment. Thus, eco-shadows following usage of any antimicrobial should be minimized.

Biography

Tore Midtvedt has been a Lecturer in Medical Microbiology, Department of Bacteriology, Faculty of Medicine, University of Oslo, Norway since 1961-1963. He was a Visiting Scientist in the Department of Germfree Research, Karolinska Institute, Stockholm, Sweden from 1963-1966, Lecturer in Bacteriological Pharmacology, Faculty of Medicine, University of Oslo, Norway since 1966-1969. He was an Associated Professor in Medical Microbiology, University of Oslo since 1973-1982. He was a Professor in Medical Microbiology, University of Oslo, Norway since 1982-1983. He was a Professor and Chairman in the Department of Medical Microbial Ecology, Cell and Molecular Biology in Karolinska Institute, Stockholm since 1983-1999 and has been a Professor Emeritus in Karolinska Institute since 1990.

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