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Occupational exposure of healthcare workers to antibiotics

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Antibiotics are used in the treatment and prevention of bacterial infections and in the treatment of autoimmune diseases. Preparation and administration of antibiotics is widespread over many departments in hospitals and many healthcare workers are involved in handling these drugs daily. Most common side effects in patients include rash, diarrhea, nausea and vomiting. Allergies or hypersensitivity reactions, and especially anaphylactic reactions are the most severe side effects. Adverse health effects of occupational exposure to antibiotics in healthcare workers are scarcely published. Weak and moderate effects include hypersensitivity, allergic skin reactions and respiratory symptoms. More severe effects include drug resistance and even anaphylactic shock. Healthcare workers handling antibiotics, frequently report that they smell the drugs, have a bitter taste in their mouth, and observe splashes and leakages during the preparation. Piperacillin and ceftriaxone are reported to have additional handling issues that perpetuate the problem. Syringe withdraws from these vials result in leakage along the needle's shafts. Considering all these aspects, there is a concern that healthcare workers continuously exposed to levels of antibiotics may suffer from adverse health effects, raising a need to reduce potential exposure as much as possible. A few studies were performed, monitoring antibiotics at different departments in hospitals in Europe. The aim was to measure contamination on surfaces during preparation and administration of antibiotics using the most common needle/syringe or needle/spike/syringe

combination. Surface contamination was measured by taking wipe samples from potentially contaminated surfaces. The most frequent antibiotics were monitored: vancomycin, meropenem, augmentin, ceftriaxone, cefotaxime, cloxacillin, piperacillin and benzylpenicillin. Extracts of wipe samples were analyzed using LC-MS/MS (detection limit: 1 ng/ml extract or 100 ng per sample) and contamination levels were calculated in ng/cm². The results of the studies show widespread contamination with antibiotics at nursing departments resulting in potential exposure of the healthcare workers.

Biography

Paul J M Sessink studied Chemistry (Organic Chemistry and Toxicology) at the University of Nijmegen (Radboud University) in The Netherlands. In November 1996, he attained a PhD in Medical Sciences at the University of Nijmegen by defending his thesis entitled, "Monitoring of occupational exposure to antineoplastic agents". In 1995, he founded Exposure Control, a consulting firm that has developed a broad spectrum of methods for environmental and biological monitoring of hazardous drugs which are of great concern to the (occupational) population world-wide due to potential adverse health-effects. He is the Co-Author of approximately 40 scientific publications regarding environmental and biological monitoring of occupational exposure to cytotoxic drugs. An overview of his publications is available on the website www.exposurecontrol.net.

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