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Editorial

Transmission of Antibiotic Resistance from the Aquatic Environment to Humans

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DESCRIPTION

Antibiotics are persistent contaminants in the aquatic environments. These bacteria often are associated with hospitals and other health-care settings. These usually occur in the urban water cycles like in surface, groundwater, drinking or waste waters and in association with the intensive animal rearing. The increase in antibiotic-resistant bacteria might be the result of factors like overuse and misuse of antibiotics in humans, incomplete removal of biocides from the wastewater plants, antibiotic use in animal and crop agriculture and usage of antimicrobial substances in personal care products. The usage of antimicrobials has benefitted the aquaculture via improving on-farm biosecurity, husbandry and treatment of chronic and epizootic diseases. Vaccines are considered as vital tools for preventing and controlling of these diseases in fish and also act as a measure for controlling the unregulated use of antimicrobials in the aquaculture.

DISCUSSION

Antibiotic resistant bacteria and antibiotic resistance genes in rivers may pose risk to the human health and aquatic living organisms. Drug-resistant bacteria can infect any person of any age and in any country. They lead to the longer hospital stays, higher medical costs and more preventable deaths. This is the reason why antibiotic resistance has been identified by the WHO as one of the biggest threats to global health. The risks of transmission of the antibiotic resistance from the environment to the humans can be assessed based on the antibiotic-resistant bacteria that are able to colonize and proliferate in our human body. The risk is a function of their fitness in the human body and presence of the resistance and the virulence genes. The more often antibiotics are used, the more bacteria adapts and finds new ways to survive, which further means they can become resistant to the antibiotics. Instead of being killed by the antibiotics, some bacteria may survive and continue to multiply in us by causing more harm. Antibiotics are used treating of many diseases and surgical procedures. Antibiotics are consumed by humans and animals profoundly modify a commensal microbial flora and select bacterial strains that are increasingly resistant to these respective molecules.

CONCLUSION

The environment is a natural reservoir of many bacterial species and many antibiotic resistance genes, enriched continuously by the pollution from human and other animal sources. Permanent exchanges between the human, animal and environmental reservoirs perpetuate the emergence and spread of antibiotic resistance. Risk of spreading of the antibiotic resistance from the environment to the humans is to be managed below a precaution principle because it will become too late to act if we tend to wait till we've got to concrete the values of risk. Antibiotics can enter the aquatic environment through three different ways: inadequate treatment of the waste water, improper disposal of the unused prescriptions of antibiotics, and agricultural run-off. Antibiotic concentrations can be seen in many effluents, surface waters. Soil environments can be almost many times lower than the levels used in the clinical or industrial settings. Such concentrations can still be enough to allow the acquisition of resistance by the transfer of genes between bacteria. Reducing of the concentration of antibiotics in river water usually depends on the treatment of waste water.

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