P006

ANTIMICROBICI

HOW TO REDUCE THE HUMAN ANTIBIOTIC RESISTANCES? SMART-WC AND GOOD PRACTICES

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INTRODUZIONE

The constant increase in the environment of antibiotic-resistant microbial forms is real emergency and therefore every year results in a significant increase in deaths caused by microbial infection from resistant strains. Antibiotic resistance is a European (or better global) phenomenon that has been constantly spreading in recent decades. The introduction of penicillin in 1929 offered the possibility of eradicating infectious diseases but also caused the appearance of bacteria resistant to the action of the antibiotics themselves. In fact, a large part of the drugs we take is eliminated as such by urine and faeces, while the existing purifiers are designed to reduce the organic load in the wastewater but not to eliminate the drugs that may be present and very diluted in them. So, the microflora in sewage treatment plants is not able to eliminate the cocktail of antibiotics (non biodegradable) which are therefore found into the aquatic environment as sea, rivers and lakes causing bio-accumulation.

METODI

In this study and tests a Smart-WC prototype equipped with a device that can guarantee, through chemical catalysts, the elimination / destruction / deactivation of residues of antibiotics and metabolites, and associate microflora potentially carrying resistance, is proposed. In practice, the new toilets are equipped with a system to dispense chemical reagents (eg tablets) containing nano-titanium dioxide particles or Fenton reagents, directly in the toilet bowl, readily able to initiate drug degradation, thus avoiding induction over time of the resistance of the bacteria to antibiotics.

RISULTATI

The new "original" proposal is a new "home-cleaning antibiotics technology" vs antibiotic resistance, based on the domestic treatment of antibiotic residues: it is in the bathroom that the individual is subjected to antibiotic therapy for a limited time, generally a few days, faeces and urine are released / containing a portion of antibiotic residues and metabolites (clearance). It is here, in bathroom, that action must be taken immediately, as the time zero, therefore "upstream" and not "downstream" of the wastewater treatment plants. Thhis solution allows the proportion of waste actually containing antibiotic residues in humans to be treated "only" in a targeted manner during those days of therapy; it is therefore an action in a reduced space, volume and time. This means into high degradation efficiency, as well as cost reduction.

CONCLUSIONI

The proposed technological solution allows the proportion of waste actually containing antibiotic residues in humans to be treated "only" in a targeted manner during those days of therapy; it is therefore an action in a reduced space, volume and time. This means into high degradation efficiency, as well as cost reduction. The following are avoided: effects of dilutions between few wastewaters with antibiotics and large volumes of wastewater without antibiotics; ii) the establishment of drug-resistance gene transfer processes in the microflora in sewer pipes, iii) the difficulties to make changes to the wastewater treatment plants already in use. An adequate and targeted campaigns of information is required for citizens in all coutries for new sustainability solutions combined to ad hoc environmental policies.