



Are We Really Experiencing the End of the Antibiotic Era? Some Historical Reflections

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Editorial

All things are poisons, for there is nothing without poisonous qualities. It is only the dose which makes a thing poison. Paracelsus (Dec 1493 to Sep 1541).

Health was defined in 1948 by the WHO (World Health Organization) as the perfect and harmonious physical, social and mental well-being. In 2003 there was a menu that added, based on scientific evidence, the fourth factor of harmony, the spiritual one. By understanding health holistically, considering the advances in the health area, the aging of the world population and the increase in the demand for rehabilitative treatments, it is not possible to conceive that surgical interventions of medium and large size can be dissociated from therapeutic actions, be it to prevent, treat, diagnose or provide therapeutic drug support to the individual.

History is defined as the science that studies the past facts of humanity (historical fact) to understand the present and plan the future. Whatever our conception of the origin of life, by theories of creationism or evolutionism, germs, microbes, microorganisms, have always been present. Lest we see: In Leviticus 11:35 it is written, "And every thing whereupon any part of their carcass falleth shall be unclean; whether oven, or range for pots, it shall be broken in pieces: they are unclean, and shall be unclean unto you". From the other theory, the existence of microorganisms was already proven in the 1665 by Robert Hooke, with the publication *Micrographia*, where for the first time a microorganism, the *Mucor* microfungi, was described. Already in 1683, Antoni van Leeuwenhoek, observed and described protozoa and microscopic bacteria. These obvious discoveries were only possible thanks to Hooke and Leeuwenhoek's commitment to the manufacture and use of the first microscopes, capable of magnifying objects of about 25 to 250 times [1].

Since then, we have experimented (from Paul Ehrlich and Sir Alexander Fleming) discoveries of new antimicrobial agents, but also of (many) new pathogenic microorganisms. And it should always be remembered that resistance to antibiotics has also been present. There are reports that enzymes produced by microorganisms, such as β -lactamases being present on plasmids for millions of years.

The new definition of Antibiotic: Substance produced by a microorganism or a similar product produced wholly (synthetic) or partially (semi-synthetic) by chemical synthesis and in low concentrations inhibits the growth of or kills microorganisms-leads us to think how indelible is the relationship between disease and cure, between poison and remedy.

With a frightening growth of microbial resistance to antibiotics, by the non-rational use of the latter throughout the world, attempts to "break" the cycle of microbial resistance to these drugs have been made for some time, including restricting or isolating the use of some antibiotic agents in countries or even continents. But the so-called "globalization" has been a difficult process for the implementation of these "good practices".

The use of growth promoters for animals consumed as food for humans, many of which are based on antimicrobial agents such as tetracycline, and the irrational use of antimicrobial agents also in agriculture has led to a frightening increase in the number of microbial species that are resistant to several antibiotic agents, thus reducing the options of these agents to treat in particular individuals hospitalized in intensive care units, increasing treatment costs and also (unfortunately) increasing the number of deaths due to the lack of effective agents against various infections. With food exports across continents, it seems to us that population isolation is unfeasible, for a desirable loss of antimicrobial resistance.

The so-called superbugs have also spread around the world and are a real concern and are still lacking in efficient treatments. The antimicrobials used in animals belong essentially to the same

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classes used in humans.

Recently (2008), a clinical guideline from the National Institute for Health and Clinical Excellence (NICE) recommending the cessation of antibiotic prophylaxis was carried out in the United Kingdom. A 2011 study took stock of the effectiveness of the action and the results were inconclusive if antibiotic prophylaxis still has a role in protecting some patients at particularly high risk [2].

And we must to think globally. Can the reality of developed countries be applied to those emerging countries? One of the main guidelines for the non-use or even the rational use of antibiotic prophylaxis is the implementation and maintenance of a strict aseptic chain, in the whole process of manipulation of living tissue in surgical interventions, which is often difficult-no longer impractical in routine of medical and dental clinics in less developed countries. The simple use of PPE and disposables often makes health care actions practically impossible in these nations,

but not all are bad news sometimes we need to take a step back so that we can follow some ones ahead. And again history has shown this in 1846 the Hungarian doctor Ignaz Philipp Semmelweis proved the intimate relation of the puerperal fever with the medical care. He noted that physicians who went directly from the necropsy room to the obstetrics room had an unpleasant odor on their hands and postulated that puerperal fever affecting so many parturient women was caused by "cadaveric particles", transmitted from the necropsy room to the obstetrics, wing through from the hands of students and doctors. Probably in the 1847's, he advocated that students and physicians must wash their hands with chlorinated solution after necropsies and before examining obstetric patients. This simple action caused the mortality rate to fall from 12.2% to 1.2%.

Wash hands... so simple, and so effective. It is at least frightening to watch in supermarkets and in grocery stores in emerging countries that the box attendants humidify their fingers with their own saliva to facilitate the opening of plastic bags (and here we will not even cite the environmental risks of using non-biodegradable plastic bags) before placing the products within them.

A non-virtuous cycle forms and dissemination of microorganisms gains volume and concern. And the so-called developed countries are also not free from these disgusting practices that reconcile lack of health education, lack of guidance for good food safety practices and of course, life. Simple acts such as the use of alcohol-based gel containers to moisten the fingers in a healthy way and constant hand hygiene would be very effective measures in avoiding the abusive use of antibiotics all over the world. Wash your hands...feed yourself correctly and healthily...these simple acts brings us back to history, as in the following secular quotations:

Let thy food be thy medicine, and let thy medicine be thy food. (Corpus Hippocraticum-Hippocrates, father of medicine).

The art of healing comes from nature, not from the physician. Therefore the physician must start from nature, with an open mind. Paracelsus (1493 to 1541).

Hippocrates (460 to 377 a.C.)-before the discovery of microbes advocated the use of wine to wash wounds (prevent infections). But a phrase attributed to Alexander Fleming again traces historical reflection: "The antibiotic saves man, but only wine makes him happy".

So let's wash our hands and feed ourselves well..body, mind and soul. And disseminating health...

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