

Quaternary Prevention from the Laboratory of Microbiology

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At present, microbiologists, healthcare workers and the society in general, are becoming more and more conscious about the problem of antimicrobial use and abuse and its terrible consequences for people and for the planet we live in. We have been struggling for many years to rationalize the use of antimicrobials and, so far, all we see is a growing problem and a catastrophic forecast: it has been estimated that, by 2050, 10 million people could die every year due to antimicrobial resistance [1]. Some progress has been made in terms of the commitment made by policy makers to contribute to this cause. These measures are essential for combating this very worrisome worldwide problem. But, why do not we go a step behind and try not to encourage the use of antimicrobials?

Quaternary prevention involves actions taken to identify a patient or a population at risk of overmedicalisation, to protect them from invasive medical interventions and provide for them care procedures which are ethically acceptable [2]. It means that care providers must avoid making diagnosis or treating diseases that do not exist just because the patient seek for medical advice, following the old principle of “not to harm”.

As we know, overdiagnosis and overmedication is enormously motivated by defensive medicine [3] and by lack of time dedicated to the patient-doctor encounter [4]. It can be hard for a clinician to make the patient understand that he/she does not need tests or treatments, regardless of how skilled the clinician is or how much the patient trusts this doctor.

If we leave aside the global effects of antimicrobial overuse in the population and we only think in the patient, it is pretty obvious that when we prescribe a patient an antimicrobial that he/she does not need we are harming him/her in many ways: adverse effects of antimicrobials, disturbing of the normal microbial flora, financial costs, among others. Then, by not prescribing an unnecessary antimicrobial we are applying quaternary prevention measures. Another opportunity of quaternary prevention arises when we do not indicate an unnecessary paraclinical test, because the result of such test could lead to a harmful intervention.

Form the laboratory we can contribute to quaternary prevention by educating the healthcare workers and the patients about the importance of avoiding unnecessary testing. We also need to establish and follow strict protocols to reject performing tests that, to our judgement as specialists in microbiology, not only are not necessary but will probably be detrimental to the patient. Who will dare not to prescribe an antibiotic to a patient who comes with a laboratory result describing a pathogen and its antibiotic susceptibility?

As an example, let's imagine that a healthy adult complained of rectal itch/pruritus. Then a doctor indicated a rectal swab for microbiological analysis, the rectal swab was sent to the laboratory, a culture was performed and, obviously, the Petri dishes became invaded by fecal flora. Let's now suppose that a not very experienced and/or careful microbiologist could maybe decide to study and inform the predominant morphotype in the Petri dish, e.g. a *Escherichia coli* strain. The patient comes back to the doctor who indicated the rectal swab. What is this doctor going to do?

There are many possibilities, of which we are just going to mention two: 1) The doctor will maybe explain the patient that *E. coli* is normal fecal flora. The doctor, and maybe the patient, will then realize that, in the first place, he/she should not have indicated a

rectal swab, which, by the way, is almost always a useless test, except for the screening of multi-resistant bacteria and for some sexually transmitted diseases. 2) The doctor will simply prescribe an antibiotic because the patient brought a microbiological report indicating he has *E. coli* in his rectum. In this last case (in my experience, the more probable), imagine if the strain produces an extended spectrum beta-lactamase. The patient could end up with a carbapenem treatment because of fecal carriage of a multi-resistant.

Of course, this case illustrates a chain of errors in the medical care to a patient, begging with the prescription of an inappropriate laboratory test and finishing with the inadequate prescription of a broad spectrum antibiotic, not to mention that probably the doctor who indicated the rectal swab maybe did not even made a physical exam to the patient. This is another story, but it also contributes largely to over-testing and overmedication.

This example may seem exaggerated, and it was intended to be so in order to indicate a clear case of inappropriate use of a laboratory test. But, unfortunately, cases exactly like this occur too frequently in real life [5,6].

Clinical microbiologists should be involved in patient care as much as we can. We should not waste the opportunity to start at the beginning: prevention at all levels.

Bibliography

1. O'Neill J. "Antimicrobial Resistance: Tackling a Crisis for the Health and Wealth of Nations. 2014". Review on Antimicrobial Resistance, London, United Kingdom (2017).
2. Jamouille M. "Quaternary Prevention, an Answer of Family Doctors to Overmedicalization". International Journal of Health Policy and Management 4.2 (2015): 61-64.
3. Mahmood S and M Tabraze. "From Defensive Medicine to Quaternary Prevention: The Transition That Pakistan Needs". Cureus 10.4 (2018): e2449.
4. Visentin G. "The Difficult Choice Of "Not Doing" Comment On "Quaternary Prevention, an Answer of Family Doctors to Overmedicalization"". International Journal of Health Policy and Management 4.8 (2015): 559-560.
5. Silver SA., et al. "Positive Urine Cultures: A Major Cause of Inappropriate Antimicrobial Use in Hospitals?" Canadian Journal of Infectious Diseases and Medical Microbiology 20.4 (2009): 107-111.
6. Zhi M., et al. "The Landscape of Inappropriate Laboratory Testing: A 15-Year Meta-Analysis". PLoS One 8.11 (2013): e78962.

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