



Wellbeing Clinic Newsletter

Today's Focus: **ANTIBIOTIC RESISTANCE**

Having done a couple of slightly more leisurely newsletters during the summer months, it is now time to focus on one of the most serious problems that medicine faces today and which at some point could affect everyone. It is well known that conventional medicine relies heavily on antibiotics. Antibiotics, starting from penicillin, discovered with a bit of random luck in 1928, truly revolutionised conventional medical practice and enabled it to become what it is today. It is largely thanks to these drugs that people are today less likely to die from a simple respiratory infection or an infected cat scratch. It is also thanks to them that countless other medical interventions, including surgical procedures, became possible (without reliable means of controlling infection many such procedures would be too risky to perform or, putting it simply, could kill you). However, for decades antibiotics have been very irresponsibly used, not only in the human health treatments but also, perhaps even more so, in agriculture, with potentially disastrous consequences.

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A recent news article, published by the Guardian on 16 September 2024, with a self-explanatory title [Superbugs 'could kill 39m people by 2050' amid rising drug resistance](#) describes how mass deaths may possibly result from increasing microbial resistance to antibiotics. Further article, also published by the Guardian on the same day [Drug-resistant infections are on the rise – so why aren't we getting any new antibiotics?](#) provides insights into how “*Infections that were once easy to cure with antibiotics are becoming untreatable*” and how the development of new antibiotic drugs has “*stalled*” meaning that there are too few new antibiotic drugs to replace those that have now become less effective in treating infections due to microbial resistance. The problem is not a future or a hypothetical one. Already, as the Guardian put it, “*The number of deaths caused by drug-resistant bacteria in 2019 was 1.27 million, and economic costs are on track to exceed \$1tn (£765bn) by 2030.*”

Paradoxically, as we learn from the Guardian, in spite of a desperate and truly global need, the pharmaceutical companies are abandoning the ship *en masse*, in search of better profits elsewhere, since, as the Guardian put it “*Cheap drugs for chronic conditions such as diabetes or high blood pressure can still make companies big profits, because they are taken*

by a lot of people for a long period – often a lifetime. By contrast, antibiotics are used for a short period to deal with infections.” Doesn't this make you think of the old fashioned saying “A friend in need is a friend indeed”?

If you think about it however, it cannot possibly be just about the financial incentives, because, given the demand, the lucky one who did manage to come up with another breakthrough antibiotic treatment should make some decent profits. So, let us speculate a little. Is it perhaps that these companies have now so little to offer in this area that they don't even bother to invest in it anymore, but it is a little too embarrassing to admit? Saying that they have a bigger fish to fry hardly seems to save their face though, especially noting that this very sector has created this dangerous mess in the first place. Or may there be some other considerations?

Indeed, rather counterintuitively, the above may still not be the worst news. Another the Guardian article [Rivers you think are pristine are not': how drug pollution flooded the UK's waterways – and put human health at risk](#) published on 27 September 2024 reveals how it may now be dangerous to swim in British rivers, due to them being polluted with “*concoction of chemicals that could pose a*

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threat to the freshwater organisms and humans who come into contact with it" since "Antidepressants, antibiotics, diabetes treatments and anti-inflammatory drugs are among the chemicals flowing in the water". The article explains how the levels of antibiotic pollution in many rivers are such that this may promote development of antibiotic resistant bacteria, which essentially means that you may be exposed to those superbugs even if you have never been in a hospital or have never taken an antibiotic yourself, because of antibiotic residues which are now also present in the wider ecosystem, along many other forms of pharmaceutical pollution which also causes a widespread damage to the environment. The problem is obviously not limited to the UK, similar drug pollution is now reported all over the world. This creates a seemingly unresolvable problem since we need more antibiotics to fight antibiotic resistant bacteria but even if we did manage to create more such antibiotics, these would only end up creating more antibiotic resistance and even more powerful and dangerous superbugs.

So, are we all doomed?

Not quite yet. Let's look at this research paper published on 22 December 2020 on NCBI's

website [Novel Opportunity to Reverse Antibiotic Resistance: To Explore Traditional Chinese Medicine With Potential Activity Against Antibiotics-Resistance Bacteria](#). If you have the time, we highly recommend reading it in full as it is fascinating (just as all other TCM studies).

We are learning from there that given the difficulty with synthesising new antimicrobial drugs "Recently, researchers shifted their sights to traditional Chinese medicine (TCM)." (Surprise, surprise!)

The paper explains how the antibiotic therapies are at first effective against infection for some time but eventually lose or significantly decrease in efficacy due to development of microbial resistance and how "it is dramatically important for human health to effectively prevent the spread of antibiotic-resistant bacteria".

Furthermore, the paper describes in some detail various mechanisms by which pathogens are able to develop resistance against antibiotic treatment. These include genetic mutations, formation of bacterial biofilm, enzymes which allow the pathogen to destroy or deactivate the antibiotic molecules as well as mechanisms which prevent the antibiotic from entering the pathogen's cells or

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others allowing the pathogen to eliminate the antibiotic from the entrance of its cell. With so many forms of defence the pathogens are able to deploy it is no wonder why finding new effective antibiotic drugs is difficult.

The reason why research is now setting its eyes on TCM is, as the paper says, that: *“TCM herbs and their active ingredients have been found to exert multiple antibacterial roles and effective therapeutic effects on antibiotic resistant bacteria. Therefore, the rescue roles of TCM on antibiotic resistance have become an international research hotspot in recent years.”*

So, as it turns out, not only is TCM not a scientific backwater as some like us to believe but **“an international research hotspot”**, which, as the researchers put it, provides *“an alternative path for finding new treatments against bacterial infections”*.

The paper further declares that there is a large resource globally of medicinal plants *“in which 400 species of TCM herbs are included. The application of those TCM herbs on the prevention and treatment of diseases, including infection and cancer, has been practiced for several thousand years.”* 400 herbs sounds like quite a lot but if you looked at other studies, the number of TCM herbs

known to have antimicrobial properties is stated as at least double this number, and that might still potentially be an underestimation.

As the researchers further explain *“TCM treatment on infection diseases have many advantages, such as abundant resources, moderate price, multi-component, multi-target, and medical synergism. Therefore, TCM treatment may be one of the effective methods to solve the problem of antibiotic resistance.”*

And this is because there is increasing evidence that TCM herbs *“exhibit obvious antibacterial ability and enhance the activity of antibiotics”* and *“some of them diminish antibiotic resistance”*. When “evidence” is mentioned, we understand they mean research papers (as you would expect from a research paper), but let's not forget the existence of empirical evidence, which may not be described in prestigious scientific journals but could include for example your very own TCM treatment experience.

The paper then goes on to provide several examples of herbs, including even some common spices, known to contain active antimicrobial ingredients and description of their action on microbes. We will not quote all these details but if you are interested you can refer to the full article. The bottom line here is

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that the sheer variety of medicinal herbs available with their multiple antimicrobial properties and mechanisms provides many ways in which it is possible to either fight the pathogens directly or to stop them from developing antibiotic resistance (i.e. make the antibiotics useful again). And so, as the researchers conclude *"There has been an emerging trend of multi-target drug development, using TCM herbs and their active ingredients."*

This is just one example of many studies on TCM herbs. As is typical for a research paper, its narrow scope is solely focused on antimicrobial properties of herbs. Remarkably, but not unusually, the focus is placed on *potential* development of *new* drugs from TCM herbs but omits the fact that there are already multiple TCM herbal formulas in existence and in widespread use, containing the same herbs or others with similar properties.

One other study (on a different TCM related subject) published in the Journal of Traditional Chinese Medical Sciences mentions for example that the number of all existing TCM formulas, not only those with antimicrobial properties, exceeds ...a mere 97,000. Yes, this is what it says, **more than ninety seven thousand**. We knew of course that there were

quite a lot of them but it is nice to have a figure in mind to help put things in a correct perspective, especially since the Western science loves figures and statistics. That same publication also says, what is an obvious fact for TCM professionals, that, if your TCM practitioner prescribes two or more existing formulas to be taken together, you get something called "a compound". Interactions between active ingredients of several formulas create essentially a "new" treatment that displays properties and health benefits different, and potentially more comprehensive, than just a sum of actions of individual formulas used separately. This essentially means that if one formula can't do it, you can still combine formulas and get a better chance of success, and therefore many more treatment options. How many you might ask? We'll leave it to someone else to do the maths.

We hope that this gives you an idea of the size of treatment toolkit TCM can already (and not just potentially) deploy at your service. In fact, Chinese medical sector routinely uses TCM herbal remedies in hospitals and other public healthcare settings. Whilst there is nothing wrong with finding new drugs, aren't some people out there trying to reinvent the wheel?

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And that's not all! There are some more good news which the research paper on the antimicrobial herbs we have discussed doesn't mention (and fairly enough as it would be outside of its scope). In addition to all the antimicrobial herbs we could rely on, TCM holds more heavy weapons in hand against infections and inflammations. Examples of which include:

- Prevention – if you are not sick you don't need antibiotics or other drugs, correct? TCM has many ways of either maintaining good health or treating problems at very early stages before they develop into a disease. In fact, in the "older days" the most highly respected TCM doctors were the ones who could keep their patients healthy.
- Ability to treat many conditions without surgery or other invasive procedures, thus largely eliminating the risk of life threatening infections associated with such procedures as well as greatly reducing the necessity of a hospital treatment or of an antibiotic treatment.
- Ability to regulate and support the healthy action of the immune system, helping your very own body fight infections more effectively. This again can reduce or eliminate the necessity of antibiotic

treatment in many cases, but also greatly support the efficacy and reduce the risks of many conventional treatments, including hospital procedures and treatments of more serious infections. By the way, this is also great for many autoimmune disorders.

In the end of the day, given the havoc that the antibiotics have already created, it would be best for everyone to keep their use to an absolute minimum, or if possible, eliminate them altogether, and TCM is capable of providing many (or shall we just say ... countless?) resources and solutions to do just that. If you read our earlier newsletter "TCM State of the Market", you may recall that in 2015, the total number of people diagnosed and treated in TCM institutions in China alone was of circa 910 million, or 17.5 million people a week (more than double of the whole NHS waiting list in a single week!). We can only assume that this number must have increased even further since then. This ancient discipline is not only a huge and actively growing market but also has a lot more to offer to the science and the wider medical sector. It may, and we very much believe it will, not only save the conventional medicine from self-inflicted extinction but also become an actual medicine of the future.

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