Antidepressant Use Connected To Antibiotic-Resistance Superbugs

The more fluoxetine an E.coli microbe is exposed to, the more likely that bacteria is to develop multidrug resistance, says a new study from the University of Queensland in Australia. What is fluoxetine, and why is this a big deal?

Fluoxetine is a selective serotonin reuptake inhibitor (SSRI) and the active ingredient in some of the world's most prescribed anti-depressants like Prozac and Sarafem. E.coli bacteria were exposed to fluoxetine for 30 days in different concentrations. The bacteria were then exposed to antibiotics like chloramphenicol, amoxicillin, and tetracycline. The microbes exposed to the fluoxetine showed an increased resistance to antibiotics that was 50 million-fold higher than the experiment control. The more the bacteria were exposed to the SSRI, the more quickly the drug resistance developed. Jianhua Guo is one of the authors of the study.

> *Fluoxetine is a very persistent and well-documented drug in the wider environment, where strong environmental levels can induce multi-drug resistance…This discovery provides strong evidence that fluoxetine directly causes multi-antibiotic resistance via genetic mutation."*

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Ubiquitous Fluoxetine

Fluoxetine is an incredibly popular drug. Healthcare practitioners issued more than 28 million prescriptions for it in 2018. It's almost always among the top 30 medications

prescribed worldwide. It’s everywhere, and the link between the antidepressant and antibiotic-resistant bacteria could have serious consequences.

This study is a lab-based study, and it’s fair to wonder how the drug and the bacteria interact in a real-world scenario. Scientists don’t know. When a drug this popular has the potential to hasten the evolution of multidrug-resistant bacteria though, we need more studies.

In People

Most antidepressants are taken for longer than a year. But even a short period on fluoxetine can give harmful bacteria the time they need to develop resistance. Prozac takes longer to exit the body than other SSRI medications like Paxil or Zoloft. While those examples 99 percent out of the body after 5 and 6 days respectively, Prozac takes nearly a month. These medications “fix” problems by disrupting the endocrine system. A disruption like that allows infections to flourish in the body.

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Not to Be Depressing…

We’re not ready for the level of antibiotic-resistant bacteria developing in our society. We know that antibiotics fed to food animals are a major source of those developments. Yet U.S. farmers are still using antibiotics regarded as “crucial to human health.” The authors of this study found that triclosan, an ingredient in antibacterial soaps, causes antibiotic-resistant bacteria. Now antidepressants have been linked to multidrug resistance.

We aren’t taking confirmed causes of this health seriously, and we are constantly finding new potential causes we hadn’t even considered. It’s a recipe for disaster.

Sources:

- *One of The Most Widely Used Antidepressants Has Just Been Implicated in Breeding Antibiotic Resistance* – Science Alert
- *Antidepressant may cause antibiotic resistance* – University of Queensland Australia
- *Antidepressant fluoxetine induces multiple antibiotics resistance in Escherichia coli via ROS-mediated mutagenesis* – Science Direct
- *Fluoxetine Hydrochloride Drug Usage Statistics, United States, 2005 – 2015* – ClinCalc
- *Going off antidepressants* – Harvard Health Publishing