

New class of antibiotic raises hopes for urgently-needed gonorrhoea drug

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A new class of antibiotic has been found to work in the lab against the sexually transmitted infection gonorrhoea, which can cause infertility and damage to babies and is fast becoming resistant to all existing drugs.

Although it is early days, because the antibiotic has yet to be tried in animals or humans, researchers say they are excited by its potential. The World Health Organisation has listed [gonorrhoea as a high priority infection](#) that poses a great threat to human health, estimating that there about about 78m gonorrhoea infections worldwide each year. In the UK, gonorrhoea is the second most common bacterial STI after [chlamydia](#), with 35,000 cases in England in 2014 alone. New drugs are urgently needed.

Closthioamide, which was discovered in 2010, has been tested in the lab against samples of the *Neisseria gonorrhoeae* bacterium causing the disease by researchers from Imperial College London and the London School of Hygiene and Tropical Medicine (LSHTM).

They tested 149 samples of bacteria from hospital patients with infections in the throat, urethra, cervix and rectum. Very small amounts of the antibiotic were effective against 146 of the 149 samples. The drug was also effective against samples of the drug-resistant bacteria provided to the researchers by the World Health Organisation. [Their results are published in the journal Antimicrobial Agents and Chemotherapy.](#)

[Drug resistance](#) is an escalating problem. The World Health Organisation (WHO) has estimated that 700,000 people around the world die annually from drug resistant infections. Scientists have found it difficult to discover new antibiotics and many pharmaceutical companies have left the field, because it is hard and there are no reliable long-term markets. New antibiotics are used as little as possible to conserve their potency. When they are widely used, resistance begins to set in and they cease to be effective.

Victoria Miari, lead author from LSHTM, said: "Antibiotic resistance, combined with the reduction of drug development, is one of the biggest health issues facing the world today. The problem threatens to render many human and animal infections untreatable, including gonorrhoea. With no effective vaccine available, new antibiotics are urgently needed to tackle this infection which, left untreated, can have very serious consequences.

"The results of our initial laboratory studies show that closthioamide has the potential to combat *N. gonorrhoeae*. Further research is needed, but its potential to successfully tackle this infection, as well as other bacteria, cannot be underestimated."

Dr John Heap, lead author from Imperial's department of life sciences, described the new findings as exciting, but stressed the antibiotic will not be in use any time soon. "There is a long way to go

from where we are right now before we have a medicine ready to give to anyone in the clinic,” he said.

But, Heap added, the antibiotic is promising, not least because it has a very unusual structure. “Often you might come across an antibiotic and it looks just like all the other antibiotics – it is a very close relative of an existing one or it turns out it does just the same thing,” he said.

“[Closthioamide] is exciting, partly because it has such a weird structure we might expect it to have different properties to other antibiotics.”

And there is another advantage. “Fortunately, in the case of this [antibiotic], there is a method to make it synthetically so we don’t have to grow massive, massive vats of the bacteria and squeeze tiny amounts out,” said Heap.

Claudia Estcourt, professor of sexual health and HIV at Glasgow Caledonian University and a member of the British Association for Sexual [Health](#) and HIV, said she was cautiously optimistic about the development, pointing out there are many steps before the drugs can be used in clinic.

“Because of the biology of gonorrhoea itself and, I think, the lack of success in work gone into producing a vaccine, antibiotics are absolutely essential because currently they are the only treatment for an important sexually transmitted infection which has both public health and individual health impact.

“To have something at this stage that is showing very early promise in the laboratory is very exciting – but there are many compounds that may produce early, exciting results across the spectrum of infectious disease but never reach usability in humans.”

Estcourt also stressed the need for greater awareness of safe sex and for individuals to have check-ups, pointing out that gonorrhoea infections do not always come with symptoms.

“Prevention is better than cure and services need to be available to support this,” she said.

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