

Restricting antibiotics could be key to fighting 'superbug'

September 25 2013

New ways are needed to fight the infection *Clostridium difficile* and better use of antibiotics could be key, according to the authors of ground-breaking research.

In a unique United Kingdom study, the team from the University of Leeds, Oxford University Hospitals NHS Trust and Oxford University, mapped all cases of *Clostridium difficile* (*C.diff*) in Oxfordshire over a three-year period (2008 to 2011).

C. diff causes severe diarrhoea, cramps and sometimes life-threatening complications, and has traditionally been thought to be transmitted within hospitals from other sick *C.diff* patients.

The research found that less than one in five cases of the so called "hospital superbug" were likely to have been caught from other hospital cases of *C.diff*, where the focus of infection control measures has been.

Researchers also found the total number of cases of *C.diff*, whether acquired from other sick patients in hospitals or acquired from elsewhere, fell over the three-year period. As a result, the research suggested stringent infection control measures in hospitals were not the most significant factor in curbing the infection.

Professor Mark Wilcox, of the University of Leeds and Leeds Teaching Hospitals NHS Trust, leads on *C. diff* infection for Public Health England and was member of the study team.

He said: "This is a landmark study in understanding how patients with *C. diff* are linked. The results have an important message for infection teams. Continuing on the same path to controlling *C. diff* will not ensure that all preventable cases are avoided. New measures are needed to prevent this bug spreading and being provoked to cause infection."

The study, supported by the National Institute for Health Research (NIHR) Oxford Biomedical Research Centre, the Wellcome Trust and the Medical Research Council, was published today in the *New England Journal of Medicine*.

Tim Peto, study author and Professor of Infectious Diseases at the University of Oxford, said: "We must be clear, good infection [control measures](#) have helped minimise transmission rates in hospitals. However, what our study has shown is the vast majority of cases were not caught from other hospital cases and the total number of cases has fallen, so other factors, in addition to hospital infection control, must be at work."

Prof Peto said that during an overlapping period to the study, the use of antibiotics fell across 175 English hospitals. He added: "*C. diff* is resistant to antibiotics and that is the key."

Dr David Eyre, co-author of the study, said: "People usually become ill with *C. diff* after taking antibiotics, because antibiotics don't just kill "bad" bugs but also "good" bugs in the gut, allowing the resistant *C. diff* to take over. One explanation for all types of *C. diff* going down is that using antibiotics more carefully can prevent people becoming ill with *C. diff* even if they are exposed to it.

"Our study indicates that restricting the use of [antibiotics](#) may be more effective in reducing the number people who fall ill with *C. diff* than lowering transmission rates through [infection control](#) measures."

By assessing the genetic variation between *C.diff* cases, the team identified those cases that were matched and were likely to be linked. By adding hospital records and the community movements of each case, they worked out if that transmission was likely to have happened as a result of hospital or patient contact.

They found that 35 per cent of cases were so genetically similar that they were likely to be caused by direct transmission. Of that group, just over half (55%) could be linked by hospital contact. In total, only 19 per cent of all cases could be clearly linked to hospital transmission from other sick patients with *C.diff*.

Prof Peto said: "Additionally, 45 per cent of all cases were so different that they could not have come from another sick *C.diff* patient in Oxfordshire. These results suggest that there is a large, unknown reservoir of *C.diff* bugs that can cause infection and more work needs to be done to identify these sources.

Provided by University of Leeds

Citation: Restricting antibiotics could be key to fighting 'superbug' (2013, September 25)
retrieved 27 April 2024 from

<https://medicalxpress.com/news/2013-09-restricting-antibiotics-key-superbug.html>

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