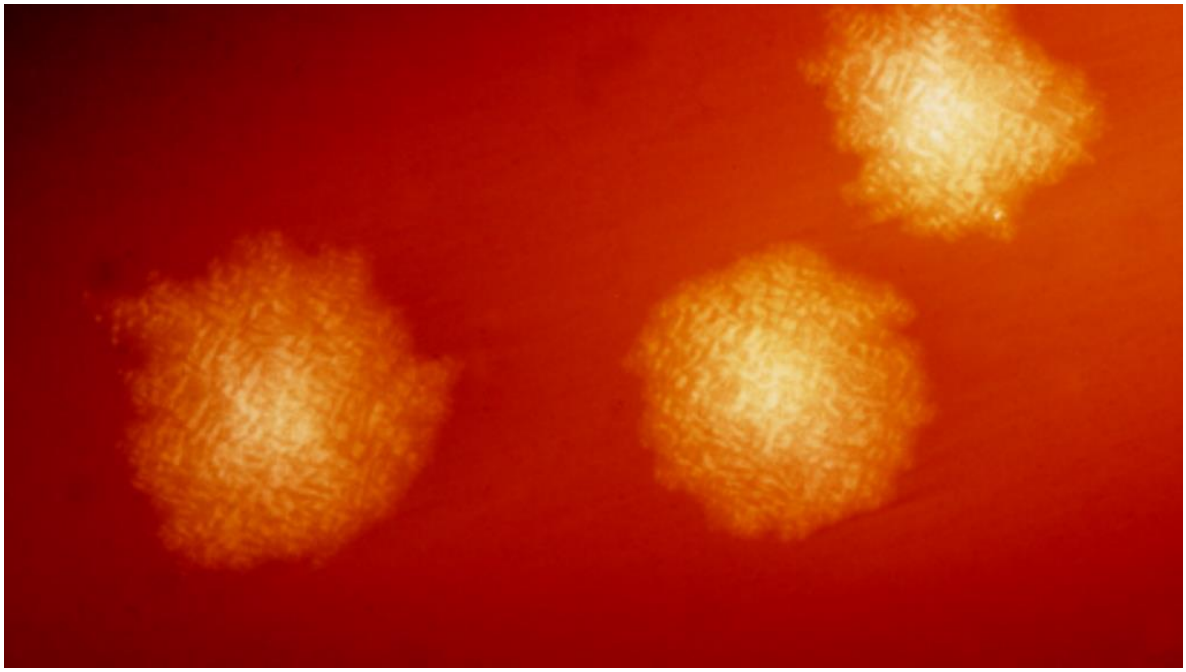
Improving Clostridium difficile diagnosis

In 2009, St George's researchers developed new diagnostic testing procedures for Clostridium difficile (C diff) after identifying serious inadequacies with existing testing procedures in an earlier study. These new procedures have been adopted across the NHS in the UK, as well as across Europe and the United States, allowing clinicians to improve their understanding of C diff and in turn improve prospects for patients.



Background and research

C diff can cause diarrhoea and severe inflammation of the bowel, and leads to around 3,000 deaths a year in the UK alone. C diff is a naturally occurring micro-organism which can thrive when the normal balance of the gut is upset, meaning patients on antibiotics are at risk.

The elderly are also at risk, with over 80 per cent of C diff infected people aged over 65. A quick and accurate diagnosis is important to halt the spread of the bacteria, alongside good hand hygiene and regular cleaning of wards, bedpans and toilets.

Following a systematic review of 18 studies on the effectiveness of C diff testing procedures, Dr Timothy Planche, consultant microbiologist and lead researcher, found that as many as 20 per cent of positive results were incorrect, and that a further 20 per cent of C diff infections were being missed. At the time of the research, this meant that as many as 11,000 patients were being incorrectly diagnosed with the infection in the UK.

A false negative result could mean that infected patients don’t get the right treatment and could pass the infection on to others. Conversely, patients receiving a false positive result may

receive inappropriate treatment and be placed in wards along with infected patients, putting them at risk of contracting the infection.

Dr Planche recommended a two-stage testing process, involving two different assays (tests). The first test would be a quick test to weed out the negatives. Stool samples returning a positive result on the first test would then be given a second test in order to weed out the false positives.

In 2009 Dr Planche confirmed the superiority and efficiency of the two-stage testing process during a nine month period at St George's Hospital, analysing 700 stool samples. This paved the way for a large St George's sponsored multicentre study, involving hospitals across England, to devise a diagnostic algorithm for NHS hospitals in England.

This major study, funded by the Department of Health and the Health Protection Agency, analysed over 12,000 stool samples. As well as clearly demonstrating the poor performance of individual tests, the study identified the optimum combination of dual assays and showed the importance of the cytotoxin assay component of the two-stage test in predicting mortality.

Impact

The two-stage testing procedures for C diff recommended by Dr Planche have been adopted across the NHS and in Europe and the United States.

C diff infection rates in the UK have reduced by 74 per cent since the introduction of the two-stage test.

Although several other factors including greater staff awareness, hospital cleanliness and prescribing habits are also factors in this decrease, the increased accuracy of the tests has allowed early intervention and isolation of infected patients, improving their outcomes and reducing the risk to other patients.