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Manuka honey curbs activity and growth of bacteria even at low dilutions

It works on plastic surfaces, prompting hopes of use for urinary catheters

Even low dilutions of Manuka honey curbs the activity and growth of bacterial biofilms—the thin but resilient layer of microbes that build up on, and attach to, any surface—including plastic, finds research published online in the **Journal of Clinical Pathology**.

The findings raise the prospect of the honey's potential use in patients fitted with medical devices, such as urinary catheters, which carry a high infection risk.

Around 100 million urinary catheters, which are used to drain the bladder of urine, are sold worldwide every year. Up to one in four hospital inpatients may have to use a catheter. But long term use is associated with frequent complications, such as inflammation and infection.

The use of honey as a health remedy dates back centuries, and, among other things, recent research suggests that it may have antibacterial and anti-inflammatory properties.

To find out if Manuka honey might have a role in curbing the establishment and development of biofilms, the researchers

cultured strains of *Escherichia coli* and *Proteus mirabilis* bacteria on plastic plates in the laboratory.

These two bacteria account for most of the urinary tract infections associated with long term catheter use.

The honey was diluted with distilled water and added to medium to give different 'strengths': 16.7%; 13.3%; 10%; 6.6%; and 3.3%.

In the first part of the experiment, the various dilutions were added at the same time as the bacteria in two of the wells of each of the 96 'growth' plates, and just plain medium or artificial half strength honey to the other two wells.

These were then sealed and incubated for 24, 48, and 72 hours to see whether the honey had any effect on the formation of a biofilm.

In the second part of the experiment, honey was added after 24 hours and incubated for either a further 4 or 24 hours to see if honey restricted growth of the biofilm.

The results showed that Manuka honey strongly inhibited the 'stickiness' of the bacteria, and therefore the development of a biofilm.

Even at the lowest dilution of 3.3%, it curbed stickiness by 35% after 48 hours compared with the plain medium and artificial honey.

But the greatest effect was seen after 3 days and at a dilution of 16.7%, when stickiness had been reduced by 77%. All the dilutions suppressed this by around 70% after 3 days.

As to the impact of Manuka honey on further growth, the 16.7% dilution restricted growth by 38% after 4 hours and by 46% after 24 hours. The impact was even stronger after 48 hours, but not for the weaker dilutions of 3.3% and 6.6%.

The researchers are at pains to point out that their study only related to the stickiness of bacteria and early biofilm development under laboratory conditions. Further studies in which clinical conditions more closely resembling the flow of liquid in the bladder would be needed before any firm conclusions could be drawn.

But they go on to say: “Our study demonstrates that diluted honey is potentially a useful agent for reducing biofilm formation on indwelling plastic devices such as urinary catheters, probably by using a periodic flushing agent.”

They add that patients might also benefit from honey’s anti-inflammatory properties, which are generally stronger in dark honeys, such as Manuka, and point out that antibacterial resistance is unlikely to be a factor when honey is used.

[Ends]

Notes for editors:

Research: Diluted honey inhibits biofilm formation: potential application in urinary catheter management?

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