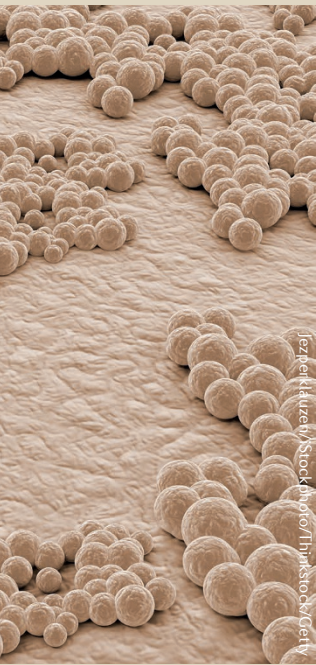


INFECTION

The urinary microbiota is unique and resilient



Patients with lower urinary tract symptoms (LUTS) owing to spinal cord injury or neurodegenerative disease often manage their long-term symptoms using catheterization. Although largely effective, this approach carries a major risk of recurrent UTI owing to colonization of the catheter. Now, data from three patients whose urinary microbiota was monitored consecutively over a year demonstrate that, although sensitive to both antibiotic-induced and probiotic-induced transient changes, an individual's unique urinary microbiota is largely resilient, and that changes in the urinary microbiota can be used to indicate an increased risk of infection.

Lead author Scott Rice explains "The motivation for this approach is the obvious issue with drug resistance, which is especially problematic in chronically catheterized patients, where it is not uncommon to have

patients with infections resistant to all antibiotics". Researchers collected explanted catheters over a 6-month period, during which patients received twice daily lactobacilli-containing probiotic formulations, and at several follow-up intervals. The composition of the catheter-associated microbiota of each patient was then investigated using amplicon-based sequencing.

Each patient was found to have a unique catheter-associated microbiota: bacteria of the phylum proteobacteria were the most abundant among all three patients, although substantial inpatient differences were observed at the genera level. Profound differences in the composition of the catheter-associated microbiota were observed in patients receiving probiotics, compared with the postprobiotic microbiota. A pretreatment catheter sample was available from one patient, and the microbiota composition was broadly similar to that observed at the end of the probiotic treatment period. Similarly, one patient had a UTI during the follow-up period, which was treated, and after which the composition of the microbiota returned to that observed prior to infection. Taken together,

although anecdotal, these observations highlight the resilience of an individual's urinary microbiota. On the relevance of these findings, Rice adds "the take home message or potential outcome is that it should be possible to monitor individuals at risk by establishing what is their baseline community and then, when there is a change in community composition, the indication is that they are likely to develop an infection. This can help alleviate the indiscriminate use of antibiotics, where, for example, the physician either simply requests that the catheters be changed more frequently or makes alternative interventions, rather than exposing the patient to drugs that should be a last line of defence."

When asked about future directions of this work, Rice speculates "we need to repeat this with a larger cohort of patients to better refine the results and, in particular, to get enough patients to see statically relevant UTI numbers".

Peter Sidaway

ORIGINAL ARTICLE Bossa, L. *et al.* Urinary catheter-associated microbiota change in accordance with treatment and infection status. *PLoS One* **12**, e0177633 (2017)