Screening prior to prostatic biopsy - a disk diffusion based method for detection of fluoroquinolone resistant Enterobacteriaceae in rectal swabs

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BACKGROUND

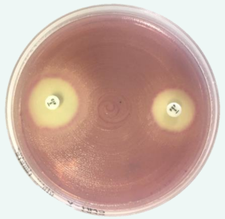
The increasing prevalence of antimicrobial resistance is challenging not only our guidelines for empirical therapy, but also those for antibiotic prophylaxis. This is particularly valid for transrectal prostatic biopsy, where an increasing frequency of post-operative bacteremia due to fluoroquinolone resistant Enterobacteriaceae has been reported (1). Here we present a disk diffusion based screening method for fluoroquinolone resistant bacteria prior to prostatic biopsy.

METHODS

Rectal swabs were obtained from patients prior to prostatic biopsy (n=414).

Samples were plated onto chromogenic Mueller-Hinton agar (CHROMagar, MH Orientation) supplemented with vancomycin 8 mg/L (CMH-V).

Ciprofloxacin 5 µg and pefloxacin 5 µg disks were applied, followed by overnight incubation.



110 of the 324 samples exhibiting growth on CMH-V were chosen for further examination. In these, susceptibility testing of all identified Enterobacteriaceae was performed using disk diffusion and EUCAST breakpoints.

CONCLUSIONS

Disk diffusion on CMH-V is a simple and promising method for the screening of carriage of fluoroquinolone resistant Enterobacteriaceae. Both ciprofloxacin 5 µg and pefloxacin 5 µg separates ciprofloxacin non-susceptible from susceptible isolates in a reliable way. Pefloxacin was superior in identifying non-wild type isolates.

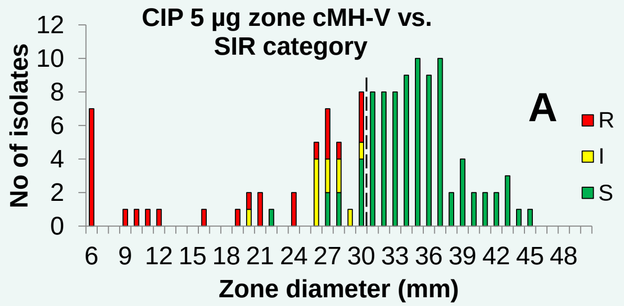
What degree of fluoroquinolone resistance that predisposes for post-biopsy complications is not known. A disk diffusion based approach allows for adjustment of the screening breakpoint depending on outcome data from ongoing clinical studies.

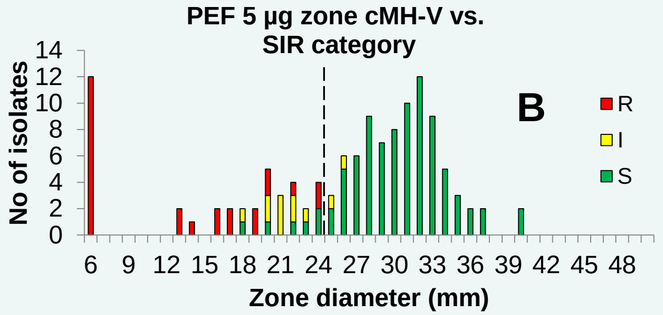
RESULTS

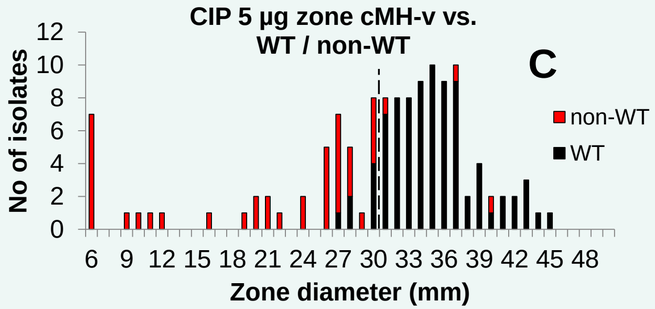
Both ciprofloxacin and pefloxacin on CMH-V plates gave a high degree of separation between susceptible and non-susceptible isolates, using breakpoints of 31 and 25 mm, respectively.

Separating non-susceptible from susceptible:
Ciprofloxacin: 100% sensitivity, 80,4% specificity
Pefloxacin: 97,6% sensitivity, 85,4% specificity

Separating non-wild type from wild type:
96,2% sensitivity, 84,8% specificity
95,2% sensitivity, 92,7% specificity







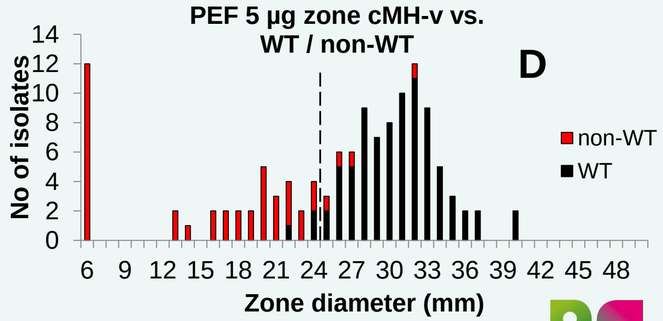


Figure A –D: inhibition zones on CMH-V of a total of 125 isolates.
Figure A and B: isolates categorised as ciprofloxacin S, I or R based on results from standard EUCAST disk diffusion
Figure C and D: isolates categorised as WT/non-WT based on the result from standard disk diffusion using pefloxacin 5 µg (WT ≥ 23 mm)

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Reference
Ref. 1. Preprostate Biopsy Rectal Culture and Postbiopsy Sepsis, Taylor et al., Urol Clin North Am, 2015.

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