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Local resistance profile of bacterial isolates in uncomplicated urinary tract infections (LORE study)

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Introduction and Purpose

Whereas microbiological tests are routinely performed in complicated urinary tract infections (UTI), little is known on the antibiotic resistance in uncomplicated urinary tract infection (UTI) in Germany since bacterial resistance testing is not performed in UTI in the outpatient setting.
The German clinical guidelines for uncomplicated UTI recommend fosfomycin or nitrofurantoin as drugs of first choice, cotrimoxazole should rather be avoided due to bacterial resistance >20% in former studies.
The LORE study aimed to define a local resistance profile for uncompli-cated UTI. Furthermore, alternative drugs were to be found for first-line treatment for uncomplicated UTI

Methods

- Study period: twenty-two months
- Setting: 29 practitioners and gynaecologists of the outpatient sector in Kiel, united in the “Praxisnetz Kiel”
- patients: female, 16 to 65 years with clinically diagnosed uncomplicated UTI. Exclusion criteria: pregnancy, diabetes, or chronic diseases as well as previous antibiotic therapy in the past two weeks before the current episode of UTI.
- antibiotic testing according to the EUCAST for: ampicillin or amoxicillin without or with beta-lactamase inhibitors, piperacillin, ceftazidime, cefpodoxime, imipenem or meropenem, ciprofloxacin, cotrimoxazole, fosfomycin, and nitrofurantoin.

The study was supported by the Robert Koch-Institute, Berlin.

	LORE study	
Study volume	**N**	**%**
Samples recruited	954	100
Samples to be included	**896**	**94**
from General Practinioners	**746**	**83**
from Gynaecologists	150	17
from Urologists	0	0
Sterile samples	**257**	**29**
Samples with relevant bacterial load	**491**	**55**
Gram-negative Rods	521	58
Gram-positive Bacteria	216	24

Tab. 1: sample characteristics, N number

	LORE study	
	N	**%**
Gram-negative Rods	**521**	**100**
Escherichia coli	**450**	**86**
Klebsiella	30	6
Proteus	23	4
Citrobacter	11	2
Enterobacter	5	1
Morganella	2	0
3MRGN	3	0,6
4MRGN	0	0

Tab. 2: distribution of isolated gramnegative rods, N number

	N	%
Gram-positive Bacteria	**216**	**100**
Staphylococci, Koagulase-neg.	**92**	**43**
Enterococci	**70**	**32**
Streptococci	43	20
Staphylococcus aureus	8	4
Corynebacteria	3	1

Tab. 3: distribution of isolated grampositive bacteria, N number

Gram-negative Rods	**N**	**S**	**%**	**Recommendations for therapy**
Fosfomycin	483	474	98	suboptimal: selection pressure
Ciprofloxacin	489	468	96	suboptimal: selection pressure
Nitrofurantoin	452	423	94	suboptimal: side effects
Cefpodoxim	**466**	**443**	**95**	recommended
Cotrimoxazol	**487**	**417**	**86**	recommended
Piperacillin	**477**	**319**	**67**	not recommended: resistance
Ampicillin+Sulbactam	**480**	**209**	**44**	not recommended: resistance
Ampicillin/Amoxicillin	**489**	**181**	**37**	not recommended: resistance

Tab. 4: results of resistance testing of isolated gramnegative rods, N number, S sensitivity

Results

- 896 samples included into the study.
- 491 samples (55%) with significant bacterial load (> 100,000 colonies per ml), 269 samples were sterile (30%).
- gram-negative bacteria isolated from 521 samples (58%)
- gram-positives in 216 cases (24%).
- *Escherichia coli* was isolated most frequently (n = 450; 70% of all samples with bacterial isolates)
- sensitivity of all samples: to fosfomycin 98%, to nitrofurantion 94%, and to cotrimoxazole 86%.
- sensitivity of gram-negative bacteria only: to fosfomycin 98%, to nitrofurantoin 95%, to cefpodoxime 95%, to ciprofloxacin 96%, and to cotrimoxazole 85%.

Conclusion

With this study, a local bacterial resistance pattern for uncomplicated UTI in women in the region of Kiel was determined.
The sensitivity rates of 95% for cefpodoxime and 86% for cotrimoxazole in Gram-negative bacteria suggest their use instead of the presently recommended drugs fosfomycin and nitrofurantoin - in order to save fosfomycin for severe infections and to avoid adverse effects of nitrofurantoin.

Wissen schafft Gesundheit

EV 0562

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