

THE ANTIBIOTIC PROPHYLAXIS AFFECT ON THE COLON *OXALOBACTER FORMIGENES* COLONIZATION IN PATIENTS WITH RECURRENT PYELONEPHRITIS AND HYPEROXALURIA (PILOT STUDY)

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OBJECTIVES

Nephrolithiasis and pre-nephrolithiasis state often coexist with recurrent pyelonephritis. Antibiotic therapy and long-term antibiotic prophylaxis can disturb the balance in oxalate-degrading bacteria in colon and induce of hyperoxaluria.

The present study was performed to investigate the quantitative content of *O. formigenes* in feces of patients with recurrent pyelonephritis and to evaluate the effect of long-term antibiotic prophylaxis on the colon *O. formigenes* colonization.

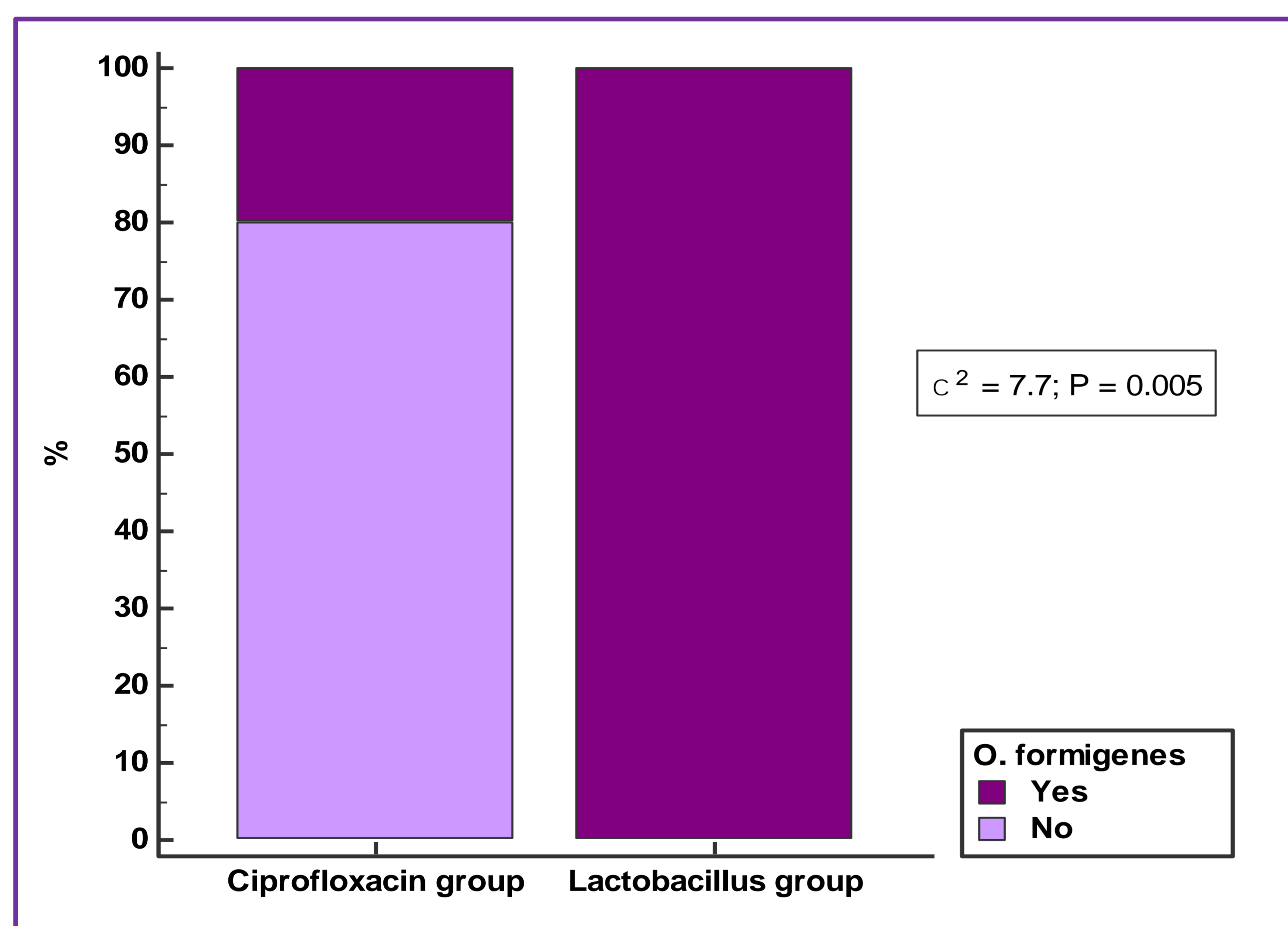
METHODS

The pilot observational cross-sectional study, involved 12 women with uncomplicated recurrent pyelonephritis, non-stone formers and 10 of conditionally healthy donors (a control group). The mean age in the patient population was 33.5 ± 9.6 years. The average of urinary oxalate excretion was 91.9 ± 22.7 mg/d.

After the main course of antibiotic therapy, the women were allocated into two groups. The first group of the patients ($n = 7$) received prophylaxis using *Lactobacillus rhamnosus* (intravaginally, twice daily, 2 weeks of every month) and the second group ($n = 5$) took Ciprofloxacin (125 mg, once daily, 5 days per week).

Oxalate-degrading bacteria in feces were identified by bacteriological culture method; sowing was realized on the selective medium, which contained oxalate as the only carbon source. The fecal samples were taken after 3 months of prophylaxis. The analysis of 24-h urinary oxalate excretions was performed using suppressed ion chromatography.

All the statistical analyses were performed using MedCalc.



The Frequency of *O. formigenes* Detection from the Feces of Patients with UTI, Depending on the Applied Prevention

RESULTS

O. formigenes in number $10^2 - 10^7$ CFU/g was detected in feces 8/12 (67 %) of the examined patients vs 7/10 (70 %) of the control group ($\chi^2 = 0.06; P = 0.8$).

The level of daily urinary oxalate excretion was significantly correlated with the quantitative content of *O. formigenes* in the intestine of the patients ($R = -0.6; P = 0.03$).

O. formigenes was isolated from the feces of all women (100 %) of the Lactobacillus group compared to 1/5 (20 %) the patients in the Ciprofloxacin one ($\chi^2 = 7.7; P = 0.005$).

CONCLUSIONS

Thus, the use of antibiotic prophylaxis by the patients with the recurrent pyelonephritis leads to the destruction of the normal composition of gut microbiota, and, primarily, due to the fact that, the content of *O. formigenes* is decreased. In turn, the deficit of *O. formigenes* violates oxalate metabolism with the formation of hyperoxaluria. The results of this pilot study are provisional and need further research with increasing sample of patients.

REFERENCES:

- Robijn, Stef et al. Hyperoxaluria: a gut-kidney axis?, *Kidney International*. 2011; Volume 80, Issue 11: 1146 - 115810.
- Miller AW, Dearing D. The Metabolic and Ecological Interactions of Oxalate-Degrading Bacteria in the Mammalian Gut. *Pathogens*. 2013; 2(4):636-652. 36