

RESISTANCE OF *E.coli* ISOLATES FROM PREGNANT AND NON-PREGNANT WOMEN WITH COMMUNITY-ACQUIRED URINARY TRACT INFECTIONS IN RUSSIA: RESULTS OF MULTICENTER STUDIES UTIAP-2002 AND ARIMB

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REVISED ABSTRACT

Objective: To compare the resistance of *E.coli* isolates from non-pregnant women with uncomplicated community-acquired urinary tract infections (CA-UTIs) and pregnant women in different cities of Russia.

Methods: One hundred and forty four non-pregnant and 117 pregnant women with signs of upper or lower uncomplicated CA-UTIs were enrolled in two multicenter prospective epidemiological studies (ten medical centers), UTIAP-2002 and ARIMB respectively. The strains isolated from the patients who had significant bacteriuria ($>10^5$ CFU/ml) were included in the microbiological analysis. The MICs of antibiotics (ampicillin - AMP, amoxicillin-clavulanate - AMX/CLV, cefuroxime -CFR, cefotaxime - CFT, gentamicin - GNT, co-trimoxazole - CTZ, nitrofurantoin - NTF, fosfomycin - FSF) were determined by the agar dilution, as described in the NCCLS (2003) guidelines. Quality control was performed using reference strains including *E. coli* ATCC 25922, *E. coli* ATCC 35218.

Results: Resistance rates of *E.coli* from pregnant and nonpregnant women with CA-UTI in Russia are shown in figure 2. There are some statistically significant differences in antimicrobial resistance between studied groups. Ampicillin resistance was higher among UTI isolates of *E. coli* in non-pregnant women (45.8%) then in pregnant women (31.6%), $p<0.05$ (Chi-Square statistic). Similar distinction in co-trimoxazole resistance was found - 27.1% and 14.5%, $p<0,05$ (Chi-Square statistic).

Conclusions: The resistance rates of *E.coli* from non-pregnant women with CA-UTIs in Russia to ampicillin and co-trimoxazole are significantly higher than in pregnant ones. There are no significant differences in resistance to other antimicrobials tested.

INTRODUCTION

UTIs are one of the most common bacterial infections in adult women. Also UTIs are the widespread medical complications of pregnancy. UTIs are usually caused by gram-negative bacteria most of which belong to the family *Enterobacteriaceae*. In most cases the choice of antibiotics for the treatment of UTIs is made empirically and should be based on the local antibiotic susceptibility data.

MATERIALS AND METHODS

Study population. Total of 144 non-pregnant and 117 pregnant women with signs of upper or lower CA-UTIs were enrolled in two multicenter prospective epidemiological studies, UTIAP-2002 and ARIMB respectively (Fig. 1).



Figure 1. Centers participating in the studies UTIAP and ARIMB

Bacterial strains. A total of 261 consecutive urine isolates from the patients who had significant bacteriuria were included in the microbiological analysis. All isolates were initially identified in local laboratories and then transferred to the central laboratory of the IAC.

Susceptibility testing. The MICs of 8 antibiotics were determined by the agar dilution method according to the NCCLS guidelines (2003).

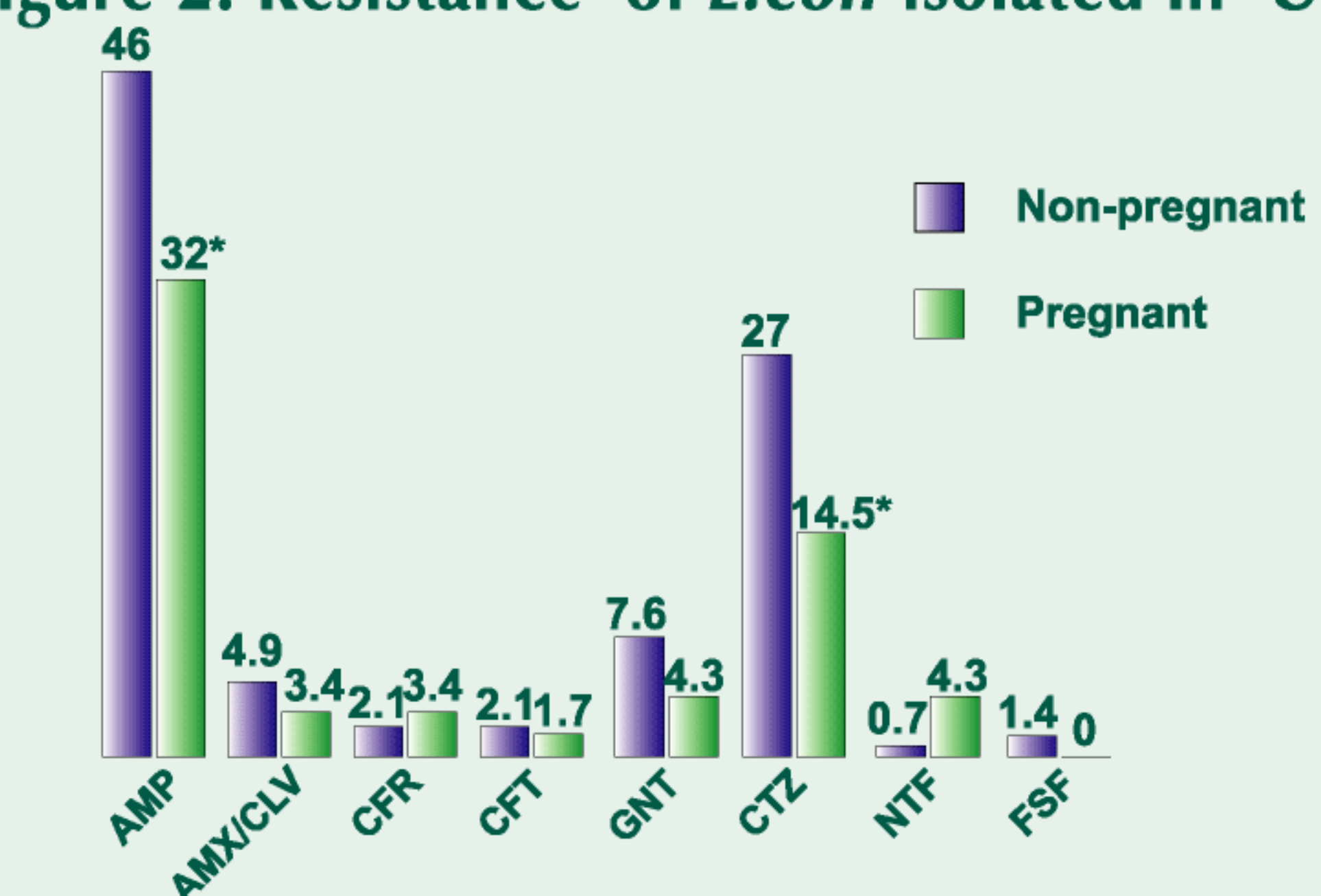
Data management and statistical analysis were performed using the M-Lab software (IAC, Smolensk, Russia) and Chi-Square statistic method.

RESULTS AND DISCUSSION

E.coli was the most frequently isolated microorganism from non-pregnant and pregnant women with CA-UTIs (76,2% and 53% respectively).

Results of the in vitro susceptibility testing of *E.coli* are summarized in Table 1 and figure 2.

Figure 2. Resistance of *E.coli* isolated in UTIAP and ARIMB studies (%) * - $p<0.05$



There are some statistically significant differences in resistance rate between studied groups. Ampicillin resistance was higher among *E. coli* in non-pregnant women (45.8%) then in pregnant women (31.6%), $p<0.05$. Similar distinction in co-trimoxazole resistance was found - 27.1% and 14.5%, $p<0,05$. No statistical differences were revealed for other studied groups.

Table 1. Susceptibility of *E.coli* to antimicrobials and MICs distribution.

Drug	Project	S, %	I, %	R, %	MIC 90 mg/l	MIC 99 mg/l	MICs distribution, mg/l															
							0.03	0.06	0.125	0.25	0.5	1	2	4	8	16	32	64	128	256		
AMP	UTIAP	54.2	-	45.8	4	256	0	0	0	0	1	3	27	43	4	0	1	1	6	58		
	ARIMB	68.4	0	31.6	4	256	0	0	0	0	0	8	38	30	4	0	1	0	1	35		
AMX/CLV	UTIAP	81.9	13.2	4.9	8	16	0	0	0	0	0	2	7	58	51	19	6	1	0	0		
	ARIMB	78.6	18	3.4	4	16	0	0	0	0	0	0	23	43	28	21	4	0	0	0		
CFR	UTIAP	97.9	-	2.1	4	8	0	0	0	0	0	10	50	62	19	0	0	2	1	0		
	ARIMB	96.6	0	3.4	4	8	0	0	0	0	0	3	28	66	16	0	1	0	0	3		
CFT	UTIAP	97.9	2.1	-	1	1	38	73	25	2	1	0	0	0	2	2	1	0	0	0		
	ARIMB	97.4	0.9	1.7	0.06	0.125	15	86	12	1	0	0	0	0	0	0	1	0	0	1		
GNT	UTIAP	92.4	0.7	6.9	1	2	0	0	0	0	0	72	58	3	2	1	3	4	1	2		
	ARIMB	94.9	0.9	4.3	1	2	0	0	0	1	12	64	13	1	1	0	0	3	2	0		
CTZ	UTIAP	72.9	-	27.1	1	64	40	0	22	22	10	8	3	0	0	0	1	37	0	1		
	ARIMB	85.5	0	14.5	0.125	64	0	54	21	13	8	5	1	0	0	0	0	17	0	0		
NTF	UTIAP	93.8	5.6	0.7	16	32	0	0	0	0	0	0	1	2	6	109	17	8	1	0		
	ARIMB	91.4	4.3	4.3	16	32	0	0	0	0	0	0	0	1	86	20	5	4	1	0		
FSF	UTIAP	98.6	-	1.4	1	4	0	0	0	6	5	84	32	9	4	2	0	0	0	2		
	ARIMB	100	0	0	0.5	4	0	0	0	0	82	16	7	5	2	3	0	2	0	0		

Cefuroxime, cefotaxime, amoxicillin-clavulanate, gentamicin, fosfomycin and nitrofurantoin were the most active antimicrobials against *E.coli*.

CONCLUSIONS

- E.coli* is often resistant to commonly prescribed antimicrobials, especially to ampicillin and co-trimoxazole.
- The resistance rates of *E.coli* from non-pregnant women to ampicillin and co-trimoxazole are significantly higher than in pregnant ones.
- The most active antimicrobials against *E.coli* were cefuroxime, cefotaxime, amoxicillin-clavulanate, gentamicin, fosfomycin and nitrofurantoin