RESISTANCE OF *SHIGELLA* SPP. IN DIFFERENT REGIONS OF RUSSIA

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Introduction and Purpose

Incidence of shigellosis in Russia is high and greater than in Western Europe and USA. In order to be efficacious, to decrease the risk of complications, and to restrict the spread of multiresistant strains in population, antimicrobial therapy of shigellosis should be based on local data on antimicrobial susceptibilities of the causative pathogen.

Methods

Methods The strains were isolated from faeces of in-patients with clinically suspected shigellosis in 1998-2001 in Bryansk (B), St.-Petersburg (SP), Smolensk (S), Moscow. The tested antimicrobials were: ampicillin (AM), ampicillin/sulbactam (AMS), cefotaxime (CTX), tetracycline (TE), chloramphenicol (CL), ciprofloxacin (CIP), and co-thrimoxazole (SXT). An agar dilution method was used in the study. All procedures were performed and the results were interpreted according to the NCCLS recommendations (January, 2003).

Results

A total of 454 strains were tested.

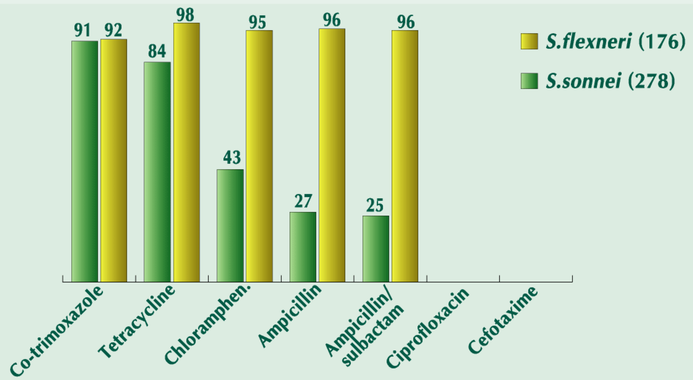

Fig.1. Resistance of *Shigella* spp. in West regions of Russia (%)

S. flexneri (176 strains) and *S. sonnei* (278 strains) were highly resistant to the following drugs (respectively) (Fig. 1): SXT (92.1% and 91.4%), TE (98.3% and 83.5%), CL (95.5% and 42.8%), AM (96.1% and 26.6%) and AMS (95.5% and 25.2%). No strains were resistant to CIP or CTX. Multiresistance (to four or more drugs) was shown in 96.1% of *S. flexneri* and 23.7% of *S. sonnei* strains (Fig. 2).

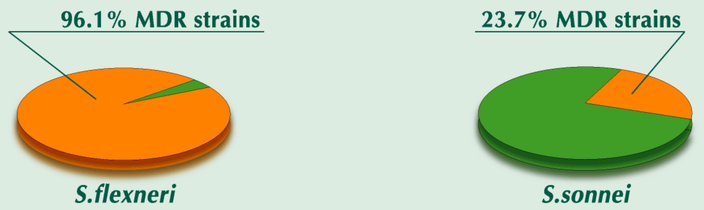

Fig. 2. Multiresistance (MDR) of *Shigella* spp. in Russia

More strains of *S. flexneri* (vs *S. sonnei*) were resistant in B (78 isolates), SP (50 isolates) and S (281 isolates), respectively, to AM (100% vs 10.9% in B, 96.6% vs 38.1% in SP, 95.5% vs 30.7% in S), CL (100% vs 26.6% in B, 100% vs 66.7% in SP, 93.3% vs 45.8% in S), TE (92.9% vs 62.5% in B, 100% vs 66.7% in SP, 97.8% vs 92.2% in S), and SXT (92.9% vs 75% in B, 65.5% vs 95.2% in SP, 96.6% vs 96.4% in S) (Fig. 3). As for *S. sonnei,* difference in the resistance prevalence among the centers was statistically significant ($p<0.05$) for all the antimicrobials; for *S. flexneri,* it was significant for SXT.

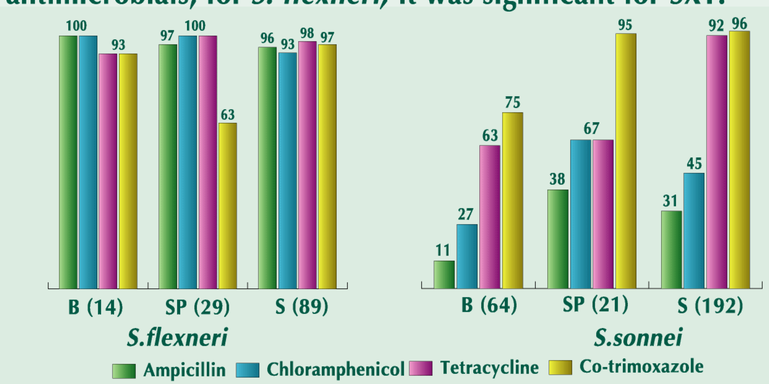

Fig. 3. Resistance of *Shigella* spp. in different regions (%)

The AM, AMS, CL, TE, SXT phenotype was the most frequent combination among *S. flexneri* strains in B, SP, and S (92.9%, 62.1%, and 87.6%, respectively) (Tab. 1). Phenotypes of resistance detected in *S. sonnei* were more various and numerous in these regions (Tab. 2). Natural susceptibility to all antimicrobials was observed only in 9.3% of *S. sonnei* in B, 1,1% in S and none among *S. flexneri* strains in the same regions.

Table 1. Most frequent phenotypes of resistance of *S.flexneri* in different regions, n (%)

Phenotype	Bryansk	St.-Petersburg	Smolensk
AM, AMS, CL, TE, SXT	13 (92.9)	18 (62.1)	78 (87.6)
AM, AMS, CL, TE	-	10 (34.5)	3 (3.4)
AM, AMS, SXT, TE	-	-	3 (3.4)
AM, AMS, SXT, CL	-	-	1 (1.1)
AMS, SXT, CL, TE	-	1 (3.4)	-
A, CL	1 (7.1)	-	-
Others	-	-	4 (4.5)

Table 2. Most frequent phenotypes of resistance of *S.sonnei* in different regions, n (%)

Phenotype	Bryansk	St.-Petersburg	Smolensk
AM, AMS, CL, TE, SXT	2 (3.1)	7 (33.3)	40 (20.8)
AM, AMS, SXT, TE	4 (6.3)	-	11 (5.7)
SXT, CL, TE	14 (21.9)	6 (28.5)	44 (22.8)
SXT, TE	10 (15,6)	1 (4.8)	75 (39.1)
SXT	16 (25)	5 (23.8)	11 (5.7)
Others	12 (18.8)	2 (9.5)	9 (4.7)
Suscept to all	6 (9.3)	-	2 (1.1)

Conclusions

- In Russia, most strains of *Shigella* spp. are resistant to AM, SXT, TE, and CL.
- The resistance of *S. flexneri* to SXT in SP and of *S. sonnei* to AM and CL in B were significantly lower than in other comparing regions of Russia.
- Polyresistance was more typical to *S. flexneri* than to *S. sonnei* in different regions of Russia.
- All the strains are susceptible to fluoroquinolones and the third-generation cefalosporins which should be recommended as the drugs of choice.