



*Original Contribution*

**ETIOLOGICAL STRUCTURE OF INTESTINAL INFECTIONS IN  
THE "PROF. DR. STOYAN KIRKOVICH" AD (UNIVERSITY) –  
STARA ZAGORA HOSPITAL IN 2013**

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**ABSTRACT**

Isolates from fecal samples of patients with diarrhea syndrome from “Prof. Dr. Stoyan Kirkovich” AD (University) - Strara Zagora Hospital were included in our study for 2013. We examined 2292 fecal samples and identified 93 strains. The most common strains were from genus *Shigella* and genus *Salmonella*, followed by diarrhea-causing *E. coli*, *Y. enterocolitica* and *P. aeruginosa*. Each of the isolates had been tested to antimicrobials.

**Key words:** *Shigella spp.*, *Salmonella spp.*, *E. coli*, *Y. enterocolitica*, *P. aeruginosa*

**INTRODUCTION**

Infectious diseases with leading diarrhea syndrome are global health problem (1).

Many microorganisms can cause infections of the gastrointestinal tract- food-borne and toxicoinfections that proceed clinically as gastroenteritis and enterocolitis- *Salmonella spp.*, *Shigella spp.*, *E.coli*, *S.aureus*, *B.cereus*, *C.botulinum*, and less *Y. enterocolitica*, *C. difficile*, *Campylobacter spp.*, *V.parahaemolyticus*, *A.hydrophila*, *P.shigeloides*, etc. (2, 3).

The development and the severity of disease depends on the causative agents, as well as susceptibility of the host, personal and communal hygiene, age, state of the immunity etc. (4) The occurrence of the disease depends on the infectious dose (5).

**Aim**

The aim of this study is to determinate the etiological structure and the antibiotic susceptibility of bacterial intestinal infections in “Prof. Dr. Stoyan Kirkovich” AD (University) - Strara Zagora Hospital in 2013.

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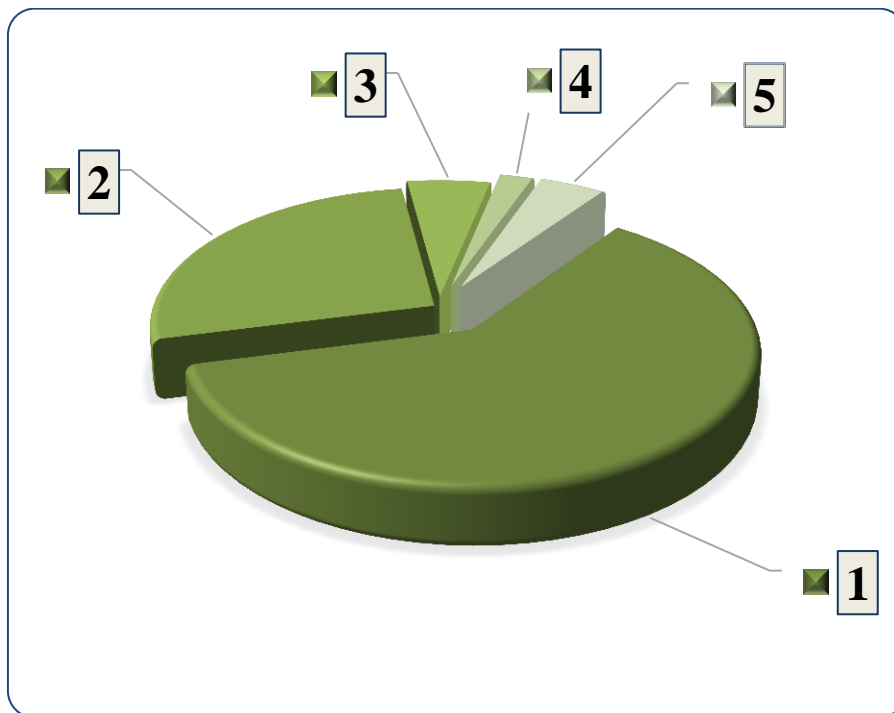
**MATERIALS AND METHODS**

During the analyzed period we have studied 2292 fecal samples of patients admitted in Clinic of Infectious diseases, Neonatology Clinic, Gastroenterology, and Dermatology Clinic. There were 93 isolates identified. We used conventional methods for the diagnostics-cultural methods biochemical methods and serotyping. The cultivation was done on Blood agar, Mac Conkey agar, Deoxycholatecitrate agar, Eosinmethyleneblue agar (Levine), Selenite Broth. Were used also manual and semi-automated and systems (Crystal GN, mini API-ID 32 E, rapid ID 32E) (6). The antibiotic susceptibility was determined on Muller-Hinton agar by DDM (Disk Diffusion Method) and DDMS (Double Disk Method of Synergism) (7).

**RESULTS AND DISCUSSION**

Etiological structure of clinically important pathogens with diarrhea syndrome is presented in **Figure 1**.

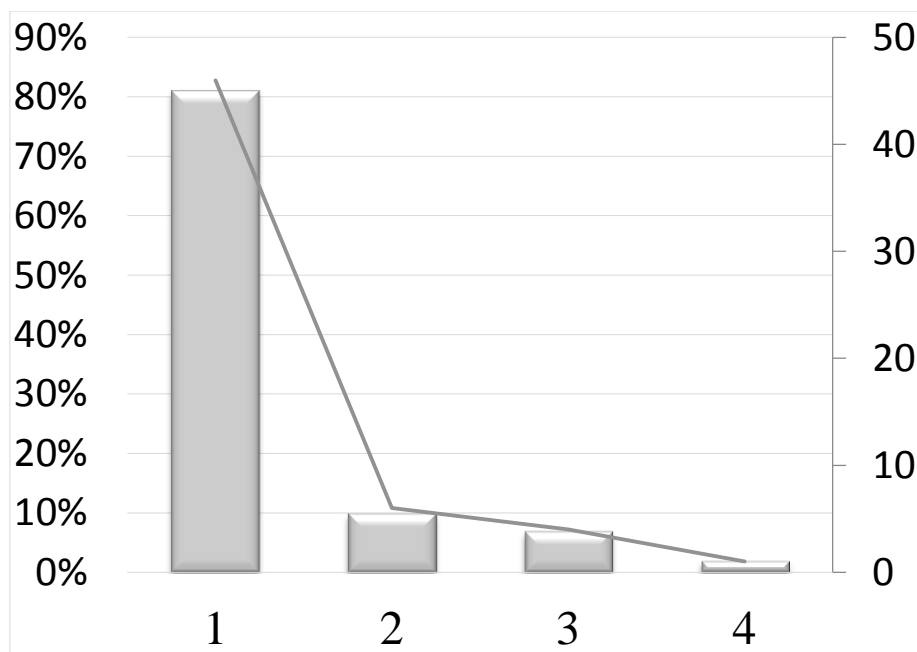
The specimen distribution of isolated *Shigella* strains is presented in **Figure 2**. The distribution of genus *Shigella* is as follows: (*S. flexneri*- 46 isolates (81%), *S. dysenteriae*3- 6 isolates (10%), *S. sonnei*- 4 isolates (7%), *S. dysenteriae* 4- 1 isolate (2%).



**Figure 1.** Etiological structure of intestinal infections in the "Prof. Dr. Stoyan Kirkovich "AD (University) - Stara Zagora Hospital in 2013.

n=93

- |    |                   |      |
|----|-------------------|------|
| 1. | Shigella          | 61 % |
| 2. | Salmonella        | 27 % |
| 3. | E.coli            | 6 %  |
| 4. | Y. enterocolitica | 2 %  |
| 5. | P. aeruginosa     | 4 %  |



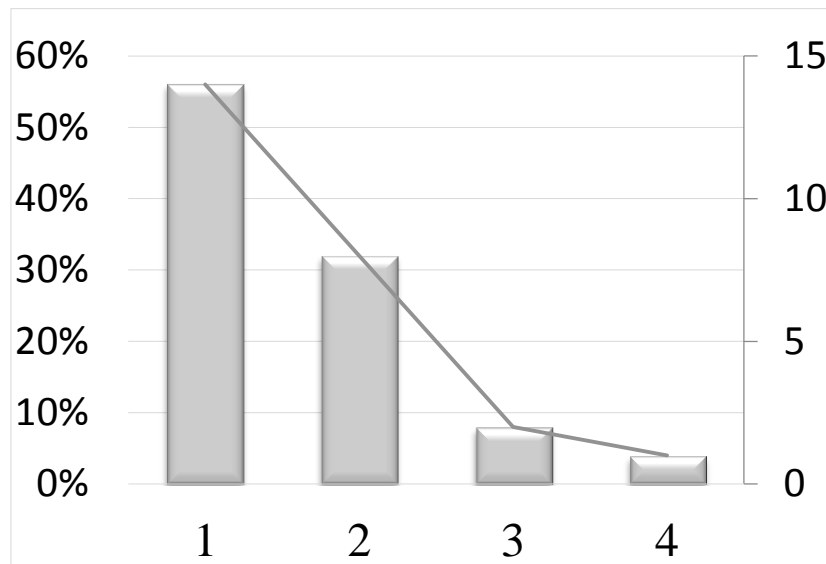
**Figure 2.** Distribution of isolated *Shigella* species.

n=93

- |    |                       |      |    |
|----|-----------------------|------|----|
| 1. | <i>S. flexneri</i>    | 81 % | 46 |
| 2. | <i>S.dysenteriae3</i> | 10 % | 6  |
| 3. | <i>S. sonnei</i>      | 7 %  | 4  |
| 4. | <i>S.dysenteriae4</i> | 2 %  | 1  |

The predominant *Salmonella* serovars are presented in **Figure 3**. Among the genus *Salmonella* the prevalence serotype is

*S. Typhimurium*- 14 isolates (56%), followed by *S. Enteritidis*- 8 isolates (32%), *S.4, 5, 12:i* - 2 isolates (8%), *S. Indiana*- 1 isolate (4%).



**Figure 3.** Distribution of isolated *Salmonella* serotypes.

n=25

1.	<i>S. Typhimurium</i>	56 %	14
2.	<i>S. Enteritidis</i>	32 %	8
3.	<i>S. 4,5,12:I</i>	8 %	2
4.	<i>S. Indiana</i>	4 %	1

Among diarrhea-causing *E. coli* (5 isolates) the distribution is as follows: *ETEC O 6 K- 2* isolates, *ETEC O 78 K 80-* 1 isolate, *EHEC- O 157 H 7-* 1 isolate.

We identified two cases with diarrhea syndrome, caused by *Y. enterocolitica*, without epidemiological connection between them.

*P. aeruginosa* were identified in four cases with diarrhea.

The case of one-year child (K. S. D.) was of a particular interest. The child was admitted in CIB II (Clinic of Infectious diseases) for *Rotavirus* enterocolitis. After ten days of hospitalization at the clinic we isolated *S. flexneri* from fecal samples. The child had treated etiologically and then discharged from the clinic. When the control cultures were made additionally *S. Typhimurium* was isolated. Both strains *S. flexneri* and *S. Typhimurium* with their antimicrobial susceptibility patterns were previously isolated from two more children. Perhaps, it is a case of nosocomial infection with *S. Typhimurium* and *S. flexneri*. The strains were sent and confirmed by the Reference Laboratory of NCIPD (National Center of Infectious and Parasitic Diseases).

The analyses of antimicrobial resistance of the isolated strains showed single cases of ESBLs positive *Enterobacteriaceae*: *S. sonnei*- 1 isolate, *Salmonella 4, 5, 12:i* - 1 isolate, *EPEC O 86 K 61-* 1 isolate.

## CONCLUSION

During the studied period the leading causative agents of bacterial intestinal infections

(enterocolitis and gastroenteritis), incl. nosocomial infection are: *S. flexneri* and *S. Typhimurium*. Strains were isolated all year long and the peak is June-October.

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