Bacteriological And Parasitological Study Of Acute Gastroenteritis Among Patients Visiting Sukraraj Tropical And Infectious Disease Hospital (STIDH), Teku, Kathmandu

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Sanjeena Jangam
Nobel College Pvt Ltd

Nisha Lamsal
Nobel College Pvt Ltd

Prashansha Sharma
Nobel College Pvt Ltd

Najma Makaju
Nobel College Pvt Ltd

Beena Mali
Nobel College Pvt Ltd

Pankaj Chaudhary
Sagarmathya choudhary Eye Hospital

Corresponding Author
pankajchy1987@gmail.com
ORCID: https://orcid.org/0000-0001-5213-4383

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Abstract

BACKGROUND: Gastroenteritis is a major public-health problem in developing nations like Nepal, where communities are still ravaged by poverty, poor sanitation, poor personal hygiene, and poor water supplies. The objective of our study was to find the bacterial and parasitic agents responsible for causing gastroenteritis.

METHODOLOGY: A hospital based prospective study was carried out for 3 months in Bacteriology and Parasitology section of STIDH. Stool samples received in respective section from patients with gastroenteritis were included in the study. Standard Microbiological Guidelines were employed for collection and processing of samples, followed by Isolation, Identification and Antimicrobial Susceptibility Testing of bacterial isolates. Normal saline and Iodine preparation were done for microscopic examination of parasites.

RESULTS: Among 421 stool samples processed in Bacteriology section, 28 (6.65%) showed bacterial growth with 15 (53.57%) Shigella flexneri, 4 (14.28%) S. higella sonnei and 9 (32.14%) Salmonella typhimurium. Ceftriaxone and Nalidixic acid were found to be the most Sensitive and Resistant antibiotic for Shigella spp. and Salmonella typhimurium. Similarly, in parasitology section, microscopic observation of 648 stool samples showed 136 (20.98%) cysts of Entamoeba histolytica, 3 (0.46%) cysts of Giardia lamblia, 2 (0.30%) trophozoites of Giardia lamblia, 1 (0.15%) larva of Strongyloides stercoralis, 1 (0.15%) ova of hookworm and 1 (0.15%) ova of Ascaris lumbricoides.

CONCLUSION: The study revealed Shigella species as the predominant bacterial agent with S. flexneri being the major one. Hence, extensive study of shigellosis with greater emphasis on resistance pattern of different group of antibiotics is essential in such hospital. Similarly, parasitic infections are found in significant amount. Hence, concerned hospital authorities and government official’s needs to take strict action in contending such infections.

Full Text

Due to technical limitations, full-text HTML conversion of this manuscript could not be completed. However, the manuscript can be downloaded and accessed as a PDF.

Tables
Table 1: Age-wise distribution of bacterial isolates

| Organisms          | 0-20 | 20-40 | 40-60 | Above 60 |
|--------------------|------|-------|-------|----------|
| Shigella flexneri  | 2    | 7     | 6     | 0        |
| Shigella sonnei    | 2    | 1     | 0     | 1        |
| Salmonella typhimurium | 1    | 2     | 5     | 1        |
| Total              | 5    | 9     | 11    | 2        |

Table 2: Antibiotic susceptibility patterns of *Shigella* spp. and *Salmonella* spp.

| Antibiotics                  | Shigella spp. (n=19) | Salmonella spp. (n=9) |
|------------------------------|----------------------|-----------------------|
|                              | Shigella flexneri (n=15) | Shigella sonnei (n=4) | Salmonella typhimurium (n=9) |
|                              | Sensitive (%) | Resistant (%) | Sensitive (%) | Resistant (%) | Sensitive (%) | Resistant (%) |
| Ampicillin/Amoxicillin       | 4(26.67)       | 11(73.33)       | 1(25)         | 3(75)        | 4(44.44)      | 5(55.56)       |
| Cefixime                     | 13(86.67)      | 2(13.33)        | 4(100)        | 0            | 9(100)        | 0              |
| Ceftriaxone                  | 14(93.33)      | 1(6.66)         | 4(100)        | 0            | 9(100)        | 0              |
| Ciprofloxacin                | 5(33.33)       | 10(66.67)       | 1(25)         | 3(75)        | 4(44.44)      | 5(55.56)       |
| Cotrimoxazole                | 3(20)          | 12(80)          | 0             | 4(100)       | 6(66.67)      | 3(33.33)       |
| Gentamicin                   | 10(66.67)      | 5(33.33)        | 3(75)         | 1(25)        | 5(55.56)      | 4(44.44)       |
| Nalidixic acid               | 3(20)          | 12(80)          | 0             | 4(100)       | 0             | 9(100)         |
| Ofloxacin                    | 8(53.33)       | 7(46.67)        | 0             | 4(100)       | 7(77.78)      | 2(22.22)       |
| Tetracycline                 | 8(53.33)       | 7(46.67)        | 0             | 4(100)       | 6(66.67)      | 3(33.33)       |

Table 3: Parasites observed in male and female

| Type of parasites                  | Male | Female | Total number | %     |
|------------------------------------|------|--------|--------------|-------|
| Cyst of *Entamoeba histolytica*    | 65   | 71     | 136          | 94.4% |
| Cyst of *Giardia lamblia*          | 2    | 1      | 3            | 2.1%  |
| Trophozoites of *Giardia lamblia*  | 1    | 1      | 2            | 1.4%  |
| Ova of *Ascaris lumbricoides*      | 1    | 0      | 1            | 0.7%  |
| Larvae of *Strongyloides stercoralis* | 0   | 1      | 1            | 0.7%  |
| Ova of hookworm                    | 0    | 1      | 1            | 0.7%  |
| Total                              | 69   | 75     | 144          | 100%  |
Table 4: Age wise distribution of parasitic infections

| Age group      | Male | Female | Total | Percentage |
|----------------|------|--------|-------|------------|
| 0-10           | 15   | 17     | 32    | 22.22%     |
| 10-20          | 10   | 13     | 23    | 15.97%     |
| 20-30          | 25   | 22     | 47    | 32.63%     |
| 30-40          | 12   | 10     | 22    | 15.27%     |
| 40-50          | 3    | 8      | 11    | 7.63%      |
| 50 and above   | 4    | 5      | 9     | 6.25%      |
| **Total**      | **69** | **75**  | **144** | **100%** |

Table 5: Isolation rate of Shigella species in various studies

| Name of author/ Year | Sample size | Isolation rate |
|----------------------|-------------|----------------|
| (Agtini, Sochamo et al. 2005) | 16872       | 7.16%          |
| (Wilson, Easow et al. 2006) | 770         | 10.8%          |
| (Shrestha, Malla et al. 2008) | 340         | 18.6%          |
| (Huruy, Kassu et al. 2011) | 384         | 15.6%          |
| (Kansakar, Baral et al. 2011) | 877         | 4.6%           |
| (Njunda, Assob et al. 2012) | 223         | 4.5%           |
| (Khan, Singh et al. 2013) | 507         | 13.60%         |
| (Shah, Sharma et al. 2013) | 268         | 2.24%          |
| (Khan, 2014) | 458         | 14.2%          |
| (Dhital, Sherchand et al. 2017) | 717         | 2.1%           |
| Present study (2017) | 421         | 4.51%          |
Table 6: Commonly involved age group in different studies

| Name of author / year             | Age group |
|----------------------------------|-----------|
| (Agtini, Soeharno et al. 2005)   | 0-1       |
| (Bhattacharya, Khanal et al. 2005) | 0-5       |
| (Wilson, Easow et al. 2006)     | 1-10      |
| (Shrestha, Malla et al. 2008)    | 21-30     |
| (Kansakar, Baral et al. 2011)   | 20-29     |
| (Njunda, Assob et al. 2012)     | 1-15      |
| (Shah, Sharma et al. 2013)      | 1-10      |
| (Khan, Singh et al. 2013)       | 1-10      |
| (Khan, 2014 .52)                | 1-10      |
| (Dhital, Sherchand et al. 2017) | 0-5       |
| Present study (2017)             | 31-40     |

Table 7: Isolation rate of Salmonella species in various studies

| Name of author/ year             | Sample size | Isolation rate (%) |
|----------------------------------|-------------|--------------------|
| (Shrestha, Malla et al. 2008)    | 340         | 8.82%              |
| (Shah, Sharma et al. 2013)      | 268         | 3.37%              |
| Present study 2017               | 421         | 2.13%              |

Figures
Figure 1

Distribution of different species of Shigella spp. and Salmonella spp.