

## Research Article

# Prevalence of *shigella*, *salmonella* and *vibrio* isolated from stool samples in district hospital

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### ABSTRACT

**Background:** Diarrhoea is one of the main causes of morbidity and mortality of in developing countries. Bacterial diarrhoea is commonly caused by *salmonella*, *shigella*, *campylobacter* species, and diarrheogenic *Escherichia coli*. Of the pathogens causing diarrhoea, *shigella* continues to play a major role in etiology of inflammatory diarrhoea and dysentery. Thus, it presents a serious challenge to public health authorities worldwide. The objective was to know the prevalence of *shigella*, *salmonella* and *vibrio* in patients suffering from diarrhoea

**Methods:** This study was conducted in microbiology department of district hospital over period of July 2015 to July 2016. We had collected total 424 stool samples. From this first we had done routine microscopy of all samples and then inoculated it on various culture media and enteric pathogen were identify by biochemical reaction and by agglutination with anti-sera.

**Results:** From 424 stool samples, we isolated, *shigella* species 10 (2.3%), *Vibrio cholerae* 6 (1.4%) and *Salmonella* species 3 (0.7%).

**Conclusions:** Results of study reveal that *shigella* species is predominant bacterial entero-pathogen causing diarrhoea and *shigella* is among highly resistant isolates while *salmonella* isolates had least resistance to majority of antibiotics. *Vibrio cholerae* is a major contributor to the diarrhoea causing severe dehydration.

**Keywords:** Diarrhoea, Enteric pathogen, Dehydration, Salmonella, Shilgella, Vibrio cholera

## INTRODUCTION

Diarrhoea is an important cause of morbidity and mortality in all regions of the world and among all ages.<sup>1,2</sup> Pathogens mainly causing diarrhoea include *salmonella*, *shigella*, *campylobacter* species and diarrheogenic *E. coli* and *vibrio* species.<sup>3-5</sup> *Shigella* continues to play a major role in etiology of inflammatory diarrhoea and dysentery. Thus, it presents a serious challenge to public health authorities worldwide.<sup>6</sup> The prevalence of *Salmonella* infection varies depending on the water supply, waste disposal, food preparation practices and climate. *Vibrio cholerae* mainly causes rice

watery diarrhoea leading to rapid dehydration. Mortality rates are found high in *vibrio cholerae* infection. Though most diarrhoea episodes are self-limiting and dehydration can usually be controlled with oral rehydration therapy, it would be ideal to be able to prevent diarrhoea, especially the more severe episodes which have a higher likelihood of progressing to complications or death. Some prevention strategies such as improved water and sanitation and basic hygiene practices are generalized and thus do not require knowledge of diarrhoea etiology, so the periodic renewal of the knowledge about trends of the bacterial enteropathogens is very essential. An epidemiologic study of an infectious disease in a

community is always considered to be an initial step toward the introduction of the proper interventions for controlling the disease because the features and the patterns of isolation of etiologic agents of the disease vary from place to place depending on the local meteorology, geography and socio-economic elements.<sup>7</sup>

## METHODS

This study was conducted in microbiology department of district hospital over period of July 2015 to July 2016. We had collected total 424 stool samples from the patients who had chief complain of diarrhoea abdominal pain and tenesmus, From this first we had done routine microscopy of all samples using iodine preparation also in which we noted whether pus cells, RBC and any abnormal structure were present or not. Then we inoculated it on various culture media. We inoculated all sample on Nutrient agar, Mac-conkey, Hecton enteric agar, and DCA agar. Then enteric pathogens were identified by biochemical reaction and by agglutination with anti-sera.

## RESULTS

We had collected total 424 stool samples from this stool samples the isolated bacteria were *Shigella* species 10 (2.3%), *Vibrio cholerae* 6 (1.4%), and *salmonella* species 3 (0.7%). In *shigella* species mainly *S. flexneri* were isolated from 8 samples and *S. sonnei* were isolated only from 2 sample. In salmonella species all three were *S. typhi* and *vibrio* species all were ELTOR *Vibrio cholerae*.

**Table 1: Prevalence rate of isolated species.**

Isolate	Species	Isolates (prevalence rate)
Shigella	<i>Shigella flexneri</i>	8 (1.8%)
	<i>Shigella sonnei</i>	2 (0.47%)
Vibrio	<i>Vibrio cholerae</i>	6 (1.4%)
Salmonella	<i>Salmonella typhi</i>	3 (0.7%)

## DISCUSSION

The study reveals that diarrhoea is more common in people living in rural set-up then the one living in urban set up . This can be attributed to poor quality of hygienic condition and sanitation practices in rural population which contributes high risk of infection especially among children. The main source of water available to rural people in present study area was either natural springs or public hand-pumps, which are at more risk of contamination, resulting in outbreaks of diarrhoea. In various study related to enteric pathogen prevalence rate as below:

In study of Christa L. Fischer Walker 34%, sample tested positive for *Shigella* spp. and 20.7% tested positive for *V.*

*cholera*, 11.5% of samples testing positive for *Salmonella* spp. which is higher than our study.<sup>8</sup>

In study of Firdausi Qadri 22.2% stool were positive for *V. cholerae* and 18.0% were positive for ETEC. *Shigella* spp. 3.4%, and *Salmonella* spp. 1.7% in this study prevalence of vibrio higher than our study but prevalence of *salmonella* and *shigella* relative comparable with our study.<sup>9</sup>

In study of M. Alam, A. Ansari, et al *Vibrio cholera* O1 Ogawa (32.8%), *Campylobacter jejuni* (17.3%), Enteropathogenic *Escherichia coli* (9.9%), *Salmonella paratyphi b* (6.6%) and *Shigella flexneri* (6.2%) were the most common organisms isolated.<sup>10</sup> These organisms show a distinct seasonal variation with summer predilection. In this study also prevalence of *salmonella*, *shigella* relatively comparable to our study

In our study, prevalence rate is low may be due to lack of awareness in public regarding mortality caused by diarrhoea and lack of awareness about stool culture and other diagnostic test.

## CONCLUSION

In our study prevalence of *shigella* species higher than vibrio species and salmonella species. Prevalence rate for various enteric pathogen is depend on seasonal effect. The knowledge of common enteric pathogen and resistance pattern of common etiological agents in local area can help practitioners to choose an adequate antimicrobial drug to start empirical therapy in a patient with severe diarrhoea without knowledge of a specific pathogen. However, as soon as the results of stool cultures are available, the therapy can be altered to a safer drug based on the antimicrobial susceptibility pattern.

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