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Causes of diarrheal diseases in flood camps near Karachi, Pakistan

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Background: An average of 5,79,732 people are adversely affected by this phenomenon each year, putting Pakistan 9th in terms of flood-affected countries worldwide. Natural disasters like floods not only displace the population but also make them vulnerable to many health, security and economic issues. Water borne diseases are common in communal livings like camps and are increased manifolds when water from floods disturbs the water and sanitation of the community. The present study was aimed to determine the frequency of water borne diarrheal infections and gastroenteritis in flood affected camps in nearby areas of Karachi.

Patients and Methods: All patients suffering from diarrhea (more than 03 stools per day for the last 02 days), abdominal pain, vomiting or fever who were residing in the camps were included in the study. A fresh stool sample for D/R and C/S, and 5 ml of venous blood sample for CP and ALT and other viral marker were collected from each suspected patient. Blood ALT was done to see any rise in ALT (an early marker for hepatitis). Serology of Hepatitis E and A virus using ELISA (Anti HEV-IgM, and anti HAV IgM) were done in those with more than 2 times raised ALT level).

Results: A total of 500 samples were collected, physical appearance and microscopic evaluation of stool samples revealed that occult blood was positive in 40% (200) specimens; protozoa were also seen i.e., trophozoite stage of *Giardia lamblia* in 45% (225) of specimens; *Entamoeba coli* in 95% (475) and *Balantidium coli* in 20% (100) of stool specimens, while cyst forms of *Entamoeba histolytica* were present in 35% (175) specimens. Bacteriological analysis showed high bacterial prevalence of *E.coli* with 63% (315), followed by *Enterobacter* species with 55% (275), then 20% (100) and 12% (60) of *Klebsella oxytoca* and *Klebsella pneumoniae* respectively. *Proteus vulgaris* and *Citrobacter freundii* found in same ratio of 8% (40, 39) with 2% (10) specimens without any microbial growth. Overall <0.05 P value and 95% of confidence interval level was observed. Further serological evidences for water associated viral hepatitis revealed 4% (20) positive specimens for anti-HEV IgM antibodies, and 2.6% (13) positive specimens of anti-HAV IgM antibodies; indicating current stage of infection.

Conclusion: In this study we concluded that contaminated water associated infections are still a health problem in Pakistan including protozoal, bacterial and viral diseases like Hepatitis A & E virus infection; especially when natural catastrophe has been occurred in such developing countries. Results of this study emphasized on presence of a variety of protozoa, bacteria and viruses associated with contaminated water supplies and suggest for a more elaborated study for appropriate surveillance.

Recommendation: Although we know that for the majority of the world's population, particularly in resource limited low socio economic developing countries; the health benefits of clean water and "flush" toilets are far from reach, but we are also aware that contaminated or un treated water plays main role as a vehicle for enteric pathogen transmission, and only a sanitary revolution can help us to reduce the burden of these sporadic outbreaks; especially after natural disasters.

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