Original Article

Frequency of infectious diseases among flood affected people at district Rajanpur, Pakistan

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ABSTRACT

Objective: To identify the frequency of infectious diseases among flood victims during and after disaster at district Rajanpur, Punjab, Pakistan.

Methodology: A cross sectional study was conducted from 15th to 31st August 2010 at 17 flood affected places of District Rajanpur of Punjab Province, Pakistan. A total of 7814 affected people were interviewed consecutively by using semi-structured questionnaire visiting the relief camps during the study period. Information was obtained after taking informed consent regarding infectious diseases: Acute Respiratory Tract Infection, Eye Infection, Gastrointestinal Tract Infection, Ear Infection, Skin and Soft tissue Infection, and suspected Malaria. Data was entered and analyzed by using SPSS version 16.0.

Result: The results showed that the distribution of infectious disease cases presented to relief camps were Gastrointestinal cases (Acute Diarrhea)-30%, Skin and Soft Tissue Infection (33%), Eye (Conjunctivitis)-07%, Ear, Nose and Throat Infection (05%), Respiratory Tract Infection (21%), and Suspected Malaria (4%). Their mean age was 23.15 ± 17.53 years.

Conclusion: Our study concluded that there was a high frequency of infectious diseases. The morbidity and mortality resulting from infectious diseases can be minimized if public health intervention efforts are implemented in a timely and coordinated fashion.

KEY WORDS: Infectious Diseases, Flooding, Affected people.

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INTRODUCTION

Infectious disease is a major health concern following flood in settings, where infectious disease transmission is an endemic public health problem. Infectious disease outbreaks have been reported following major flood events in developing countries, and these outbreaks vary in magnitude and rates of mortality.[1] Onset of flood results in an even higher infectious diseases burden, both in absolute and relative term. Flooding is associated with an increased risk of infection; risk factors that would include are population displacement, inadequate shelter conditions, degree of overcrowding, drinking contaminated water, improper sanitation, an underlying health status of population, malnutrition, local diseases ecology and difficulties in accessibility of health care services.[2] Provision of relief must consider the situation of infectious diseases in areas where flood has potential risk to human.[3]

Flooding accounts 40% of disaster worldwide, and one of the most frequent and widespread climatic hazards.[4,5] Flooding can increase exposure to toxins and pathogens, may have implication for mental health and can disrupt the capacity of health care systems to respond to health crisis.[6] Flood events can take many forms, including slow-onset riverine floods, rapid-onset flash floods, accumulation of rainwater in poorly-drained environments, and coastal floods.[7] In 2010, 13 events of flash flood were reported and the number of affected person were 21940556.[8] Pakistan had experienced severe flood on July 22, 2010. The estimated 20 million people affected is more than the estimated number of people affected by the earthquake in Haiti, the 2005 tsunami in the Indian Ocean littoral region and South Asia earthquake combined.[9] The top four infectious diseases, cause of seeking health care were acute diarrhea (314,814 cases), acute respiratory infections (317,450 cases), skin diseases (421,198), and quickly increasing cases of malaria (53,707 cases).[10] Children are more prone to acquire these illnesses due to malnutrition.[10,11] In addressing infectious diseases outbreak, we decided to go to District Rajanpur with a mission of providing medical care to flood-disaster victims. It is located in the South west part of Punjab Province, Pakistan and comprises 12, 318 Km2 area (Fig.1). The 56% (9, 08,544) of the total population (11, 03,618) was affected by flood.[12]

The objective of this study was to identify the various infectious diseases during and after disaster in order to make comprehensive intervention strategy against infectious diseases for their control and prevention.

METHODOLOGY

Setting: Study was carried out at 17 affected places of District Rajanpur of Punjab province, Pakistan. It included Wang, Basti Muhib Ali, Kutub Abad Colony, Dreeshak Floor Mill (Kotla Naseer), Darbar, Kotla Sher Mohammad, Adi Wala, Rural Health Center (Kot Mithan), Kotla Ahmed, Basti Lashari, Makkah Oil Mill Camp (Fazil Pur), Khawer Baloch Cotton Factory Camp (Fazil Pur), New Khaima Basti Railway Phatak Camp (Kot Mithan), Chargh Wala, Shah Wali Pur, and Basti Ramshah (Mohla Shahpur). District Rajanpur is divided into three Tehsils, Jampur, Rajanpur and Rojhan.

Duration of Study: The duration of study was from 15th – 31st August 2010.

Sample Size and Sampling Technique: In this cross sectional study a total of 7814 patients were included consecutively during study period.

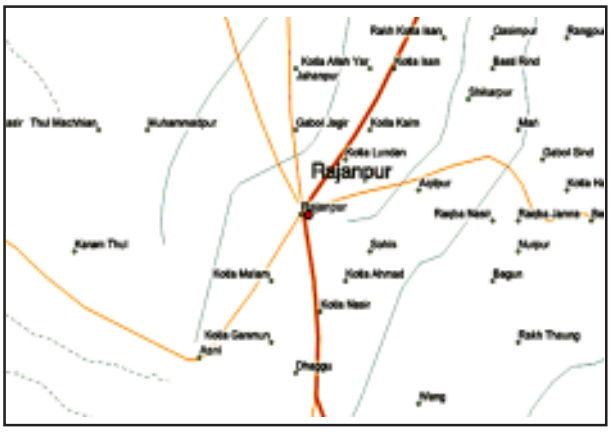

Fig-1: -Map of Rajanpur.

Inclusion Criteria: Patient of any age coming to relief camp with symptoms of infectious diseases related with gastrointestinal, respiratory, eye, ear, skin and soft tissue system and suspected malaria.

Data Collection: A semi-structured questionnaire was used to collect data on infectious diseases detected among flood victims. The data collection of infectious diseases was more focused on acute respiratory tract infection (RTI), Conjunctivitis (Eye Infection), Diarrhea (GIT), Otitis interna/media/externa (Ear infection), Skin and Soft tissue Infection (SSTI), and suspected malaria. Data was entered and analyzed using SPSS version 16.0.

Ethical Issue: Informed verbal and voluntary consent obtained prior to conducting the study. The objective of the study was explained to the participants and assured about maintaining confidentiality.

RESULTS

The data obtained from 7814 flood affected population was analyzed. Their mean age was 23.15 ± 17.53 years. Table-I describes that 60% male and 40% female had infectious diseases. The distribution of infectious diseases related to age of the study

Table-I: Distribution of infectious diseases related to Age Group and Gender.

Variable	*Frequency (n=7814)*	*Percentage*
Mean Age	23.15±17.53	
Age Group		
<5years	1473.0	19
6 to 15 years	1743.0	22
16 to 45 years	3721.0	48
>45 years	877.0	11
Gender		
Male	4722	60
Female	3092	40
Total	7814	100.0

population was stratified as follow: <5years had 19%, 6-15years had 22%, 16-45 years had 48% and >45years had 11%. Table-II shows the distribution of infectious disease cases that presented to relief camps were Gastrointestinal cases (Acute Diarrhea)-30%, Skin and Soft Tissue Infection (33%), Eye (Conjunctivitis)-07%, Ear, Nose and Throat Infection (05%), Respiratory Tract Infection (21%), and Suspected Malaria (4%). These cases were diagnosed on history and clinical examination only because laboratory facility was not available in that setting. The relative frequency of these illnesses was maintained from day 1 to day 16 during study.

Table-III describe that Tehsil Jampur had the highest frequency for majority of infectious diseases due to fact that Jampur was left isolated and with prolong stagnation of water after flood. The majority of Skin and soft tissue infections (21%), diarrhea cases (19%) and Respiratory tract infections (15%) were reported at Jampur. Tehsil Jampur reported highest frequency of suspected malaria (3%) due to unhygienic conditions, living outside their tents and stress induced chronic conditions.

DISCUSSION

Assessing the needs of a flood affected population, the first step was to gather information therefore disease morbidity and mortality was taken as one of the information priorities.[13] The information on morbidity had been used to allocate medical and health resources to the flood victims accordingly, in order to prevent mortality and communicability. Skin and Soft tissue infection (SSTI) were the highest frequency of infectious diseases (33%) detected among Rajanpur flood victims, mainly resulting from direct skin contact with contaminated flood water. In New Orleans, after Hurricane Katrina struck, tinea corporis and folliculitis were the main skin conditions among rescue workers whereas, methicillin-resistant staphylococcus aureus (MRSA), vibrio vulnificus and vibrio parahaemolyticus was seen in affected population.[14] Acute diarrhea was reported as the second most frequent infectious diseases among flood victim of Rajanpur (30%). Reported cases were clinically mild, moderate and severe and some severe cases were referred to tertiary care center for best possible treatment. In the current study, the number of non-specific diarrhea cases increased while there were no cholera cases in this investigation. Diarrhea was one of the most prominent illnesses observed in Mozambique after flood in 2000.[3] In Indonesia between 1992 until 1993, flooding was significantly linked to diarrhea related to paratyphoid fever.[15] Respiratory tract infection (RTI) has been recorded as (21%) after floods in our setting. RTI is a leading cause of morbidity and mortality usually in crisis including natural disaster and emergency. Conditions included diarrhea more than RTI among Iraqi Kurdish refugees in Iran[16] and flood survivors in Orina Indi[17] and Bangladesh.[18]

The reported frequency of ARI increased four-fold in Nicaragua in the 30 days following Hurricane Mitch in 1998[19], and ARI accounted for the highest number of cases and deaths among those displaced by the tsunami in Aceh in 2004[20] and by the 2005 earthquake in Pakistan[21].No measles, chickenpox and new tuberculosis were detected among flood victims in Rajanpur. Malaria accounts for (4%) of the total population consecutively enrolled in our study. Malaria was not detected through the use of blood smear or rapid malaria test due to nonavailability of

Table-II: Distribution of infectious diseases at district Rajanpur.

Variable	*Frequency (n=7814)*	*Percentage*
GIT Cases	2338	30
SSTI Cases	2535	33
Eye Cases	555	07
ENT Cases	391	05
RTI Cases	1652	21
Malaria Cases	343	04
Total	7814	100.0

Table-III: Frequency distribution of infectious diseases in three Tehsils of district Rajanpur.

Variable	*Frequency (n=7814)*	*Percentage*
Tehsil Jampur		
GIT Cases	1493	19
SSTI Cases	1632	21
Eye Cases	387	05
ENT Cases	266	03
RTI Cases	1137	15
Malaria Cases	196	03
Tehsil Rajanpur		
GIT Cases	676	09
SSTI Cases	639	08
Eye Cases	143	02
ENT Cases	101	01
RTI Cases	389	05
Malaria Cases	117	01
Tehsil Rojhan		
GIT Cases	169	02
SSTI Cases	264	03
Eye Cases	25	0.3
ENT Cases	24	0.3
RTI Cases	126	02
Malaria Cases	30	0.4
Total	7814	100

resources. These patients were suspected on the basis of history and clinical grounds. Similar finding were observed following the flood in Sudan in 1988[22], in Bangladesh during 1989-1991[18] and in Costa Rica in 1995.[23]

The frequency of malaria decrease after flood due to initial flooding wash away existing mosquito breeding sites, but standing-water caused by heavy rainfall or overflow of rivers can create new breeding sites. This can result (with typically some weeks delay) in an increase of the vector population and potential for disease transmission, depending on the local mosquito vector species and its preferred habitat. The crowding of infected and susceptible hosts, a weakened public health infrastructure and interruptions of ongoing control programmes are all risk factors for vector-borne disease transmission.[24] Eye infections (acute conjunctivitis) have been reported among 7% while Ear, nose and throat infection (ENT) among 5% flood victims.

CONCLUSION

Our study concluded that there was a high frequency of infectious diseases. Skin and soft tissue infections (33%), diarrhea cases (30%) and Respiratory tract infections (21%) have been reported among flood victims at Rajanpur.

RECOMMENDATIONS

There should be rapid implementation of control measures and early detection of infectious diseases. There is a need to understand the long-term consequences of flooding on health so that prior measures can be taken to prevent and alleviate the problems. The morbidity and mortality resulting from infectious diseases can be minimized if public health intervention efforts are implemented in a timely and coordinated fashion.

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REFERENCES

1. Mondal NC, Biswas R, Manna A. Risk factors of diarrhoea among flood victims: A controlled epidemiological study. Indian J Public Health 2001;45:122-127.
2. Watson JT, Gayer M, Connolly MA. Epidemics after Natural Disasters. Emerg Infect Dis 2007;13(1):1-5.
3. Kondo H, Seo N, Yasuda T, Hasizume M, Koido Y, Ninomiya N, et al. Post-flood–infectious diseases in Mozambique. Prehospital Disaster Med 2002;17:126–133.
4. Few R, Ahern M, Matthies F, Kovats S. Floods, health and climate change: A strategic review. Norwich, United Kingdom: University of East Anglia, 2004.
5. Center for Research on the Epidemiology of Disasters. EM-DAT: the OFDA/CRED International Disasters Data Base. Brussels, Belgium: School of Public Health, Universite´ Catholique de Louvain, 2010. (http://www.em-dat.net/).
6. Intergovernmental Panel on Climate Change. Climate change: Impacts, adaptation, and vulnerability. Cambridge, United Kingdom: Cambridge University Press, 2001.
7. Malilay J. Floods. In: Noji E, ed. The public health consequences of disasters. New York, NY: Oxford University Press; 1997: 287–301.
8. Mackenzie LD, David AC. Hydrology. Introduction to Environmental Engineering. Third Edition. USA: Mc Graw Hill; 1998.
9. Kronstadt KA, Sheikh PA, Vaughn B. Flooding in Pakistan: Overview and Issues for Congress, Congressional Research Service. Report number: 2010: 41424.
10. Flood Response in Pakistan. Epidemiological Bulletin. Monday 15 November 2010. http://www.reliefweb.int/rw/rwb.nsf/db900SID/EGUA-8BFT9Z?OpenDocument (accessed 20 December 2010).
11. Flood Relief and Early Recovery. UNICEF, Pakistan. Fortnightly Situation Report: July to November, 2010.
12. Government of Pakistan Statistics Division, District Census Report 1998, Census Publication No. 617, Islamabad: Population Census Organization; 2000.
13. Bradt DA, Drummond CM: Rapid Epidemiological Assessment of Health Status in Displaced Populations – An Evolution toward Standardized Minimum Essential Data Sets. Prehospital Disaster Med 2002;17(4):178–185.
14. Centers for Disease Control and Prevention. Infectious Disease and Dermatologic Conditions in Evacuees and Rescue Workers after Hurricane Katrina – multiple states. MMWR Morb Mortal Wkly Rep 2005;54:961–964.
15. Vollaard AM, Ali S, van Asten HA, Widjaja S, Visser LG, Surjadi C, et al. Risk factors for typhoid and paratyphoid fever in Jakarta, Indonesia. JAMA 2004;291:2607–2615.
16. Babille M, De Colombani P, Guerra R, Zagaria N, Zanetti C. Post-emergency epidemiological surveillance in Iraqi-Kurdish refugee camps in Iran. Disasters 1994;18(1):58-75.
17. Cariappa MP, Khanduri P. Health emergencies in large populations: The Orissa experience. Armed Forces Med J India 2003;59(4):286-289.
18. Siddique AK, Baqui AH, Eusof A, Zaman K. 1988 floods in Bangladesh: pattern of illness and causes of death. J Diarrhoeal Dis Res 1991;9(4):310-314.
19. Campanella N. Infectious diseases and natural disasters: The effects of Hurricane Mitch over Villanueva municipal area, Nicaragua. Public Health Reviews 1999;27:311–319.
20. Epidemic-prone disease surveillance and response after the tsunami in Aceh Province, Indonesia. Weekly Epidemiological Record 2005;80:160–164.
21. World Health Organization. Weekly Morbidity and Mortality Report, Volume 1: Epidemiological week 46 (12-18 November 2005) Available at: http://www.who.int/hac/crises/international/pakistan_earthquake/sitrep/FINAL_WMMR_Pakistan_1_December_06122005.pdf
22. Woodruff BA, Toole JM, Rodriguez DC. Disease surveillance and control after a flood in Khartoum, Sudan, 1988. Disasters 1990;14:151–163.
23. Saenz R, Bissell RA, Paniagua F. Post-disaster malaria in Costa Rica. Prehosp Disaster Med 1995;10:154–160.
24. Lifson AR. Mosquitoes, models & dengue. Lancet 1996;347:1201-1012.