

Health Emergencies in Large Populations : The Orissa Experience

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Abstract

Natural disasters occur frequently in the country and civic authorities requisition medical aid from the Armed Forces for the succour of populations, with increasing regularity. The recent Orissa floods (2001) saw deployment of a Medical Team and the experiences of the team are discussed. Over a nine day period, 7450 cases were treated on site in medical aid posts established in flood affected areas. Of these patients, 4038 (54.20%) were affected by gastrointestinal illnesses (diarrhoea / acute gastroenteritis); 976 (13.10%) had suffered injuries and were treated accordingly; 2007 (26.94%) cases of respiratory infection were managed. 210 (2.82%) cases of undiagnosed fever were treated, and 18 (0.24%) cases of clinical malaria were diagnosed additionally. Skin and other infections comprised 186 (2.50%) cases of the total. Thus, this study provides a brief outline of the spectrum of illnesses that may be encountered in dealing with flood affected populations, for the benefit of planning for future humanitarian operations. The various stages of a disaster have been brought out, for an insight into the morbidity pattern in such deployments. The concept of "Health Emergencies in Large Populations" is introduced in the discussion, for policy to be evolved. Public health is closely interlinked with disaster management, and the Army with its resource of trained specialists is geared for response in the face of disaster in a professional manner. Recommendations on dealing with future situations under such conditions of deployment have also been made.

MJAFI 2003; 59 : 286-289

Key Words : Disasters; Floods; Health problems; Populations; Public health

Introduction

The common dictionary definition of a disaster is "a calamity, sudden or great misfortune" [1]. In public health terms, a disaster can be defined as a destructive event that results in the need for a wide range of emergency resources to assist and ensure the survival of the stricken population [2]. Disasters present multi dimensions of relief efforts and their management needs a multi institutional approach. PAHO has summed up the definition of disaster in perhaps the simplest and most precise manner - disaster is an overwhelming ecological disruption occurring on a scale sufficient to require outside assistance [3].

The Armed Forces are frequently deployed in rendering assistance to civic authorities, in the event of calamitous occurrences, ranging from floods to earthquakes. As a consequence, the medical services have gained experience in disaster management and are geared to provide adequate succour for short periods of time, to affected populations.

'Health Emergencies in Large Populations' is a terminology increasingly used, in referring to medical aid rendered to disaster affected areas. Now-a-days training courses are available to orient medical professionals and administrators to the peculiar circumstances and the appropriate responses and planning that needs to be done in dealing with such situations [4].

Material and Methods

The present study is a descriptive report of the medical ailments encountered by one of the authors during mobilization for the recent floods in Orissa. All patients reporting to the ad hoc treatment centres established by the team at various locations in the flood affected districts during the period 19 July to 27 July 2001, have been included.

The Medical Officer was assisted by a team of one Nursing Technician JCO, two Nursing Assistants, an Ambulance Assistant and a single Ambulance for evacuation of casualties, as well as mobility of the Medical team.

The seriously ill patients were evacuated to the nearby Primary Health Centres for further management by the teams of the State Health Services. Medicines were provided to a large extent by the Armed Forces Medical Services with contribution from the numerous non governmental organizations (NGOs) that were operating in the affected areas.

Results

A total of 7450 patients were examined and treated during the deployment in Orissa. The medical team was working for long hours averaging 12 to 15 hours daily, in coping with the rush of patients. The distribution of the types of cases seen are detailed in Table 1 with the age and sex distribution in Table 2.

Triage of injured casualties was done at the treatment centres, and evacuation to the nearest civil medical establishment was done, as treatment beyond first aid was not feasible under the circumstances.

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Table 1
Distribution of cases treated

Disease	No of patients	Percentage of total
Diarrhea/Gastroenteritis	4038	54.20%
Jaundice	01	0.01%
Injuries	976	13.10%
Respiratory infections	2007	26.94%
Clinical malaria	18	0.24%
Fever undiagnosed	210	2.82%
Skin and other infections	186	2.50%
Others	14	0.19%
Total	7450	100%

Of the total patients examined and treated, 4038 (54.20%) were affected by gastrointestinal illnesses ranging from diarrhoea to acute gastroenteritis of whom 1885 (46.68%) were males, and 2153 (53.32%) females 976 patients (13.10%) had suffered injuries which included fractures, head injuries, crush injuries and minor cuts and abrasions requiring medical attention. 2007 (26.94%) cases of respiratory infection were managed, which included common cold, cough, upper respiratory infection, pneumonia (the latter being referred for further care to the State Health Services). During the course of the deployment, 210 (2.82%) cases of undiagnosed fever (no laboratory facility was available) were treated, and 18 (0.24%) cases of clinical malaria were diagnosed additionally. Dermatologic conditions like rashes, local allergies, scabies and other superficial skin infections comprised 186 (2.50%) cases of the total.

On viewing the age distribution of cases, 750 (18.57%) cases of diarrhoea were below 10 years of age, with 1290 (31.95%) cases being between 11 to 30 years of age, 1939 (48.01%) cases between 31 and 50 years and 59 (1.46%) cases in the above 50 years age group.

Injuries were sustained by more males 649 (66.5%) than females 327 (33.5%). The age distribution revealed that injuries were more concentrated in the age groups between 11 and 40 years with 666 (68.23%) of the cases, while they

were relatively lesser in the under 10 with only 55 (5.64%) cases and 81(8.3%) cases in the age group 41 to 50 years. The age group above 50 years showed a higher clustering of cases with 174 (17.83%) casualties.

Males (51.17%) had more respiratory illnesses than females (48.83%). Among those with respiratory tract illnesses, those under 10 had the maximum number of 690 (34.38%) cases, with 360 (17.94%) in the age group 11 to 20 years and 232 (11.56%) in between 21 and 30 years. There were 307 (15.3%) cases in between 31 and 40 years of age and another 228 (11.36%) between 41 and 50 years. Only 190 (9.46%) cases were in the above 50 years age group.

Fever of varied aetiology including clinical malaria were almost equally distributed between males and females 116(50.88%) vs 112 (49.12%). An equal number of cases were distributed in the under 10 and between 21 and 30 years, 32 (14.04%) cases each, with maximal clustering of 71 cases (31.14%) in the group between 31 and 40 years. The next group where concentration of cases was on the higher side, was the age group above 50 years with 62(27.19%) cases. There were relatively lesser cases, 19(8.33%) and 12(5.26%) respectively, in the age groups 11 to 20 years and 41 to 50 years.

Discussion

The pattern of diseases and injuries observed in the present study, provides an interesting perspective on the morbidity that can be associated with disasters of this kind. As can be expected, a large number of cases (54.2%) of gastrointestinal diseases were treated, which could be due to the lack of potable water and general insanitary conditions in the aftermath of the floods. It can be assumed that had the deployment been for a longer period, cases of viral hepatitis would have been seen in increasing frequency.

The occurrence of respiratory group of illnesses (26.94% of cases) ranged from cough and cold to pneumonia and could probably be attributed to

Table 2
Age and sex distribution of cases

Age group (years)	≤ 10		10-20		21-30		31-40		41-50		51-65		≥ 65	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Disease category														
Diarrhea	350	400	400	450	190	250	300	339	600	700	38	11	7	3
Jaundice	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Injuries	37	18	117	92	158	39	177	83	57	24	91	58	12	13
RTI	260	430	250	110	159	73	163	144	71	157	99	58	25	8
Malaria	2	1	0	0	3	4	1	3	1	0	3	0	0	0
Fevers	12	17	8	11	7	18	39	28	4	7	22	19	14	4
Skin and other infections	3	5	4	7	23	9	31	17	19	13	20	24	3	8
Others	2	3	3	1	0	1	0	1	0	0	0	0	2	1
Total	666	874	782	671	541	394	711	615	752	901	273	170	63	37

RTI - Respiratory tract infections

overcrowding and lack of ventilation in makeshift accommodation and refugee camps.

The injuries sustained by the people were due to collapse of houses, and trees apart from the force of flood waters and ranged from fractures to crush injuries. A few people were injured when relief packets air dropped by helicopters fell atop them, in the general scramble to salvage food and relief material, in isolated areas.

As a routine, the threat of malaria in a flood affected area is in the period immediately succeeding the receding of flood waters, as the sites available for increased vector breeding proliferate. However in the present scenario, 18 cases of malaria were diagnosed clinically and another 210 patients were treated for febrile conditions, in the latter phase of the operations, which could have been malaria. Probably availability of dipstick type of diagnostic aids would have assisted in prompt diagnosis.

The present study being a descriptive one, and with no information available on the population denominator, a reasonable inference of relevance or incidence can not be derived from the age and sex distribution of the cases. However, the presented data will definitely provide a valuable insight into the pattern of morbidity that may be encountered in such situations, and aid in the planning perspective of future relief operations.

Conventionally, the flood situation in Orissa and its aftermath would be classified based on mode of onset, into "disasters having sudden onset" [3]. Consideration of the stages in a disaster is essential for an insight into the situation, and to aid in planning of future responses.

Events during a disaster such as the Orissa floods take place in such fluid succession that it may be difficult to identify each separately. Broadly, the sequence of events observed could be divided into :-

(a) Inter-disaster stage : included the period between the cyclone in the previous year and the present consecutive disaster. In this period, a contingency plan was evolved and rehearsed, by the State Govt and local administration. Hence, the local governmental response was observed to be good and sufficient in most cases. The logistics aspect was satisfactory in as much as hygiene chemicals and medical supplies were concerned.

(b) Pre-impact stage : In the period immediately before the disaster struck, the people were apprised of the impending danger, however, most preferred to remain in their villages and brave the fury of the floods, exhibiting a psyche differing from other regions of the country.

(c) Disaster phase : The period in which the disaster struck the low lying areas of the Mahanadi delta. It could be further classified into :

- (i) Stage of isolation : There was widespread destruction of property and life including animals and crops, communities were marooned by the flood waters, and isolated from the rest of the population. This was when there was maximum morbidity and mortality.
- (ii) Stage of rescue : The Army and other NGOs commenced operations to rescue the marooned villagers. Attempts were made to start evacuation of the affected population, including animals, from the flooded areas. However, most people preferred to wait out the floods in their own areas. First-aid and limited treatment possible under these circumstances was provided by medical teams.
- (iii) Stage of relief : in which relief started coming from outside the affected area. Communication was re-established and there was well organized relief action for the affected communities.
- (iv) Stage of temporary shelter : in which refugee/relief camps were established in which kitchen and other basic amenities were provided, alongwith setting up of governmental treatment centers.
- (d) Stage of rehabilitation : in which the affected community was either rehabilitated to the original or else to an alternative site.

Disaster management is not new to this country. The Armed Forces are requisitioned for aid to civil authorities almost on a regular basis, in the present times. With the discovery of more information about various types of disasters and means for early predictability, there is scope to adopt a better strategy in disaster management. Any programme of disaster management which involves the local community would definitely help in better and effective management. Hence, the interaction with NGOs and other such agencies in the provision of relief to the affected populations would provide tremendous learning opportunities to the public health professionals and medical administrators of the Armed Forces, in gearing for future emergency response action.

What is identified as a "disaster" is often better understood as a trigger event that exposes and exacerbates underlying societal problems and weaknesses [2], and the inefficiencies of the local administrative responses. Thus, the yearly occurrence of floods in the deltas of most coastal regions of the country, results in an almost routine deployment of the Army in civic relief action. Hence, the response should be scaled accordingly, with the manpower and medical resources being deployed on a need based situation assessment by public health specialists of the Army.

Recommendations

Health Emergencies in Large Populations (HELP) are situations which call for a disciplined approach with a strong fundamental background of public health. The Armed Forces having experienced health professionals are called upon to deal with disaster situations frequently. It is becoming evident that the performance of public relief action in disasters cannot be a stand alone effort, and hence there is a need to develop a common approach to facilitate improved programme coordination between the various humanitarian agencies involved, including NGOs.

It is also recommended that prior to commitment of medical teams to affected areas, a quick survey of the region be made by a public health specialist, with periodic reappraisal of the situation, to ensure optimal utility of the deployed teams in combating health problems in the affected regions [5].

Medical professionals of the Armed Forces should be empowered to select appropriate methods of assessment (eg, Rapid Epidemiological Assessment techniques) for emergency situations [6] and receive organizational encouragement to stimulate research in this field; with a view to increase the efficiency of future deployment. In the interest of nation building, as an organisation we must foresee the possible transition of immediate assistance projects into development

programmes in coordination with local self governments.

This proactive approach by the Armed Forces would require imparting education in the field of disaster management and public health approach to Medical Officers and also medical administrators, to sensitise them to the relevance of dealing with such deployment in aid to civil authorities by a structured approach to the issue of HELP. Such a course should encompass inter related fields, with a stress on preventive medicine, public health and epidemiology, covering most activities involved in emergency situations.

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John was a clerk in a small drugstore but he was not much of a salesman. He could never find the item the customer wanted. Bob, the owner, had about enough and warned John that the next sale he missed would be his last.

Just then a man came in coughing and he asked John for their best cough syrup. Try as he might, John could not find the cough syrup. Remembering Bob's warning, he sold the man a box of Ex-Lax and told him to take it all at once. The customer did as John said and then walked outside and leaned against a lamp post.

Bob had seen the whole thing and came over to ask John what had transpired.

"He wanted something for his cough but I couldn't find the cough syrup. I substituted Ex-Lax and told him to take it all at once," John explained.

"Ex-Lax won't cure a cough!" Bob shouted angrily.

"Sure it will," John said, pointing at the man leaning on the lamppost.

"Look at him. He's afraid to cough."