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Post flood increase in skin infections in Kota district of Rajasthan: A cohort study

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Abstract

Introduction: Floods are the most common natural disaster occurring worldwide with their impact expected to grow in future due to the effect of climate changes. Flood disasters have a significant impact on chronic health conditions, with medication noncompliance due to no availability, difficulties with access to health services, and the physical workload associated with clean-up and reconstruction being significant issues. Flood affected regions serves as ideal breeding ground for pathogens leading to spread of diseases.

Aims & Objective: The aim of this article is to examine the health impact of flood disasters, including skin and soft-tissue infections and health infrastructure.

Conclusion: Disasters are complex events that can result in a wide range of health effects. Risk assessment is essential in post-disaster situations and the rapid implementation of control measures through re-establishment and improvement of primary healthcare delivery should be given high priority, especially in the absence of pre-disaster surveillance data.

Introduction

Floods can cause health impacts which are enduring, including the stress and trauma created months or years afterwards whenever floods again appear to threaten. These can be severe. Loss of treasured possessions in floods can be 'heartbreaking', and much more significant than financial losses (1). Floods are the most common natural disaster occurring worldwide [2]. In 2016, floods (excluding landslides) affected >74 million persons globally, resulted in 4720 deaths and had an economic cost of >$57 billion. Of 161 significant flood disasters worldwide in 2016, 43% occurred in Asia, 23% in the Americas, and 12% in Europe [3].Published articles on the quantitative relationship between floods and health were systematically are viewed. India's National Emergency Response Centre (NERC) said that the southern part of the Rajasthan has experienced torrential rainfall since 13th September 2019. Heavy rain in the neighboring state of Madhya Pradesh where 45000 people have been displaced by flooding has also increased levels of rivers in Rajasthan, in particular the Chambal river. In response to rising levels, authorities opened the flood gates of several dams in the state including the Kota Barrage in Kota district. As of 16th September, Kota Barrage levels stood at 259.93 metres, where the maximum is 260.9 metres, according to India's Central Water Commission. According to NERC figures, so far

in year's monsoon 54 people have died and 4822 houses have been damaged in Rajasthan. NERC said that rainfall has been 42% higher than normal for the monsoon season.

The World Health Organization defines a disaster as a disruption of society resulting in widespread human, material, or environmental loss that exceeds the affected society's ability to cope by using local resources (4).

The impact of flood disasters is expected to grow in the future owing to the effects of climate change and population shift. Flooding events are expected to increase infrequency and intensity due to rising sea levels and more frequent and extreme precipitation events. In addition, increasing levels of urbanization mean that more people will be exposed to flooding events. It is thought that floods will increase the global burden of disease, morbidity, mortality, social and economic disruptions, and will place a continuing stress on health services, especially in low-resource area. Flood disasters have a significant impact on chronic health conditions, with medication noncompliance due to no availability, difficulties with access to health services, and the physical workload associated with clean-up and reconstruction being significant issues. In this paper we would like to review major skin infections, their management and their prevention which see an upsurge in the weeks and months after natural disasters especially floods. The risk of infection after exposure to floodwaters captures considerable public attention and is a common cause of presentation for healthcare after floods.

Fungal Infections :

Fungal infection (Dermatophytosis) is the most common skin disease encountered by a Dermatologist in daily practise. Majority of the skin patients sitting in a Dermatologists' clinic at any given time belongs to the category of fungal infections. Earlier the infection was limited to men (in majority of the cases) but nowadays, women and children as young as 1 yr old are getting succumbed to the disease. The link between natural disasters and subsequent fungal infections in disaster-affected persons has been increasingly recognized(4).The risk for wound infections after a natural disaster is high when wounds are contaminated with water, soil, or debris (5).

Dermatophytic infection of the groin (Tinea cruris), scalp (T. capitis), feet (T. pedis), body (T. corporis) and steroid associated (T. incognito) are some of the common presentations. Erythematous, scaly plaque with annular margins is characteristic of Dermatophytic infections. Host factors (Atopy, Topical and Systemic glucocorticoids, Ichthyosis and Collagen Vascular Disease) and Local factors (Sweating, Occlusion, Occupational exposure, Geographic location, High humidity) are also responsible.

Pityriasis versicular / Tinea versicular is caused by Malasezzia spp. (M. furfur). It is a part of normal flora. Multiple, brown (hyper pigmented), tan(hypo pigmented), or pink, oval to round macules, patches, or thin plaques; there is often coalescence of lesions centrally with scattered lesions at the periphery. Upper trunk, shoulders and occasionally flexures may be involved.

Onychomycosis/Tinea unguium (nail infection) is another type of fungal infection affecting the nails. Total Dystrophic, White Subungual and Distal and Lateral Subungual are the 3 types involved.

Candidiasis can occur in web spaces, intertriginous areas and mucosa. C. albicans is the most common organism isolated. Oral Candidiasis (Thrush) presents

as a white exudates resembling cottage cheese. Cutaneous Candidiasis presents as erosive, erythematous patch with satellite pustules in an intertriginous zone. A fungal infection should be considered early if a patient has a persistent or progressive infection that is not responding to initial antibacterial treatment, particularly because rapid diagnosis and administration of appropriate antifungal therapy can improve patient outcomes.

Bacterial Infections

Impetigo is caused by Staphylococcus aureus and Streptococcus pyogenes. Highly contagious bacterial infection where the skin is eroded with overlying 'Honey-coloured' crusts. A bullous variant may also be present. Can occur anywhere on the body.

Ecthyma is caused by Streptococcus pyogenes. Presents as ulceration with hemorrhagic crusts that extends into superficial dermis.

Bacterial Folliculitis is mainly caused by Staphylococcus aureus. It can be superficial or deep. Beard area, upper trunk, buttocks and thighs are the involved areas.

Infection of the deep dermis and subcutaneous fat is termed as **Cellulitis**. Streptococcus pyogenes and Staphylococcus aureus are involved. Skin rubor (redness), calor (warmth), dolor(pain) and tumor(swelling) are present. Fever, chills and malaise may be present.

Superficial localized infection due to Corynebcterium minutissimum **(Erythrasma).** Interdigitale, Intertriginous and Disciform are the 3 major types. Bright coral red fluorescence with Wood's lamp is the characteristic feature.

Hyperhydrosis, prolonged occlusion and increased surface pH contributes to 1-3 mm crater like depressions in the stratum corneum of palms and soles. Kytococcus sedentarius and Corynebacterium spp. are the causative agents of **Pitted Keratolysis**.

Viral Infections

Herpes simplex infection caused by HHV-1 & 2 may occur due to stress, tissue trauma, fever, UV rays or immuno suppression. Small, round vesicles on erythematous base often painful with burning sensation are characteristic.

Herpes zoster is caused by VZV/HHV-3. Localized (Dermatomal) prodrome of intense pain and dysesthesia, with subsequent development of painful grouped vesicles on erythematous base.

Varicella is also caused by VZV/HHV-3. Fever, malaise and myalgia, followed by an eruption of erythematous, pruritic macules and papules that develop central vesicles (dew drops on rose petal) and then evolve into pustules and crusts.

Common & Palmoplantar Wartsis caused by HPV. Hyper keratotic, exophytic or dome shaped papules or plaques with punctate black dots (thrombosed capillaries) that may require paring to see. Tender with pressure. Transmitted via person to person contact.

Arthropod infection

Scabies is caused by Sarcoptes scabiei var. hominis. Erythematous papules with scale crust, with small patches of eczema, excoriations, vesicles and nodules. Nocturnal itching. Circle of Hebra formed.

Pediculosisis rare nowadays but recurrence in the disease can be seen. Pediculosis capitis/pubis/corporis are the 3 types. Direct contact is a must for transmission.

Others

Atopic Dermatitisis an eczematous dermatitis characterized by intense Pruritus and a chronic relapsing course. Genetic predisposition and environmental triggers are responsible.

Infective & Allergic Contact Dermatitis is also common.

Urticaria are characterized by wheals: papules or plaques; lesions often have a central clearing, a peripheral erythematous flare and associated Pruritus.

Conclusion

Despite great advances in medicine over the past few decades , medical complications arising from natural disaster are still very common. Floods are the most frequent natural disaster and can have widespread social and health impacts. These effects can be acute but may present only weeks to months after the flood. Each flood disaster represents an opportunity for preparedness and preventive measures to improve.

Maintaining adequate nutrition and hygiene in the society with special care towards the infected wound/lesion and a regular visit to a doctor can help in reducing the complications after burden of flood affected areas.

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