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Methicillin Resistant Staphylococcus Aureus Infections: an Important Challenge after Disasters and Emergency

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Commentary

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The risk of injury during and after the disaster is high and trauma may cause multi-microbial infections by sharp tearing inoculation. *Methicillin- resistant Staphylococcus aureus* (*MRSA*) is an increasing challenge since 1961 in England and which also expanded around the world (1). B-lactamase bacteria spectrums particularly in immunocompromised hosts may be an important problem in routine hospital care. Therefore, the survivors of natural and manmade disasters should be exclusively kept in isolated contact during transport and hospitalization until the results of microbiological lab tests become available. The previous experience improved that an accurate diagnosis is necessary upon the admission, so the experimental antibiotic treatment should be avoided before the infections appeared in patients. In other words, the case of life- jeopardize infection, the antibiotic therapy should be coating an infectious agents (1).

This commentary article aimed to study *MRSA* infections after disaster and to identify the methods for controlling and prevention of this new challenge after trauma.

Infections are usual outcomes of disasters and victims need to be hospitalized due to the type of trauma and wound infections. Therefore, the public health control measures are required to prevent Multi-resistant bacterial infections (1).

The lessons learned from last disasters showed no conducted preparedness training in health care providers and their capabilities in large-scale infectious injury response. For example in 2004 tsunami aspiration pneumonia and skin wound

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infections have been the most common infectious complications (2).

Today the community-acquired *methicillin-resistant Staphylococcus aureus* (*MRSA*) is known as a challenges after disaster threats and in cluster outbreaks, which are related to risk factors of residence in corrective facilities (3).

Furthermore, burn injury types are the major causes of trauma and mortality in the world by *MRSA* infections (4). Therefore, the public health must be devised by new prevention and control strategies in different communities (5, 6). Moreover, it is essential to know that training on public health workforce cannot be enough during formal educations by degree-granting institutions; hence, professional development should be promoted by the state and local public health centers. The last events revealed the progressive effort for strengthening of public health infrastructure must include schools of public health and medical academic center collaborations to enhance the special public health worker training (7).

According to disease Control and Prevention Center (CDC) investigations, *MRSA* infections can occur in immunocompromised hosts with skin infections look like the pimples, boils, or lesions at the site of prior skin trauma or areas covered by hair. It often begins as a small skin infection but can spread and progress into more other parts of the body. The CDC confirmed on *MRSA* transmition by direct skin to skin contact, contaminated surfaces, and shared items, that may come into contact with infections and the best prevention for them is using effective hygiene. *MRSA* infections can be prevented by simple strategies such as hand washing, covering existent skin trauma or injuries, and avoiding sharing personal items. The CDC investigations identified five common factors "5*C*'s" which can increase the *MRSA* infection risk, including the crowded living conditions, close skin to skin contacts, compromised skin, contaminant surfaces, and clean line shortages. Hence, the most common locations where the "5C's" can be executed are schools, college dormitories, daycare centers, correctional facilities, military barracks, gyms, and general households (8).

The Pennsylvania's Public Health Institute (*PHI*) affirmed that the public health training at all levels must be included in the core competencies domains defined by the Public Health Foundation *(PHF)* such as analytic assessment, policy development, communication, cultural competency, practice community dimension, basic public health sciences, financial management, leadership, and systems thinking. The *PHI* emphasized on essential services as monitoring health status, investigating health challenges, and enforcing laws or regulations that can protect health and ensure safety (9).

The evidence of surgical procedures during air transport in 2004 tsunami victims revealed some infected evacuations and colonized multi-resistant pathogens without any written instructions for infection control during the injured victim transportations (1). For this purpose, the disaster patients should be transported in pre-emptive contact isolation, which is improvised if the scenes do not have portable isolation unit and the droplet isolation awareness. Moreover, gowns and gloves should be used in patient care, and ventilators should be equipped with antibacterial filters. Patients should not share lavatories and meal facilities with other privates. The isolation for droplet precautions must be done if the upper respiratory tract is colonized in scenario and the repatriated patient chortling should be avoided in common room as the pathogens may not be the same for everyone (1).

The Southeast Asia Tsunami in 2004 and the Hurricane Katrina in 2006 indicated that possibility point-of-care testing (*POCT*) is essential in emergency and disaster care (10). Last event experiences focused on pathogen priority determining as well as designing for future disaster care scenarios that should be based on the assessment of identified needs in pathogen detection priorities (11).

Accordingly to *the POCT* research supporting, some policy recommendations should be emphasized on disaster point-of-care (*POC*) that

can be guided by the need assessment goals. In addition, the disaster *(POC) goals in design* and setting the specific scenario of the infectious disease surveillance will be able timely to manage the crisis, and provide funds to handle high portable devices that facilitate disaster preparedness and emergency. The usage of *POC* devices at a local levels encourage high user competency to complete practical designs, and strengthen reagent supplies for national preparedness that can be addressed with enduring harsh of new *POC* devices (10, 12).

This study concluded that wounds should be managed as soon as possible and the patients with suspected influenza symptoms should be emphasized about the *MRSA* co-infection.

However basic wound management steps that prevent medical problems are including: evaluation, ensuring safe scene, notice to universal precautions, participating in all wound care status, obtaining patient history, examining appropriate performance, cleansing the peripheral wound with soap and sterile solutions, providing anesthetics, control hemorrhage, removing contaminated wounds, and managing the wound infection with treatments.

The infection management can reduce the morbidity and mortality resulted from disasters. Therefore, the infectious diseases will be minimized, if the public health intervention efforts implemented in a timely manner. Such efforts require continual review in preparedness assignment at local, national, and international levels and also up-to-date educational training. Thereupon, public health workforce can take advantage of a good response in complex emergency and disasters (13, 14).

Furthermore rapid assessments should be conducted to identify the displacement people health needs as soon as possible within the first week after disasters (15). Hence, based on the gathered information after events, an initial step in public health emergency response is to activate surveillance systems that take into account the public health infrastructure disruptions and estimate whatever is available in immediate period after the actions (16, 17).

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Authors' contribution

Farzaneh Aminharati wrote the first draft of the manuscript. All authors read and approved the final draft of the manuscript.

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