EDORIUM Journals

Edorium J Infect Dis 2015;2:1–3.
www.edoriumjournalofinfectiousdiseases.com

EDITORIAL OPEN ACCESS

Emerging pathogens: The plague in Madagascar

Mauro Rubini

Although this is the antibiotic-era the problem of infectious diseases is still relevant today. The constant acquisitions in terms of knowledge in medicine and biology have allowed greater unavailability of effective tools to counter them. Yet even these tools to identify and care can reveal unnecessary if the disease is diagnosed late. Prevention (or early diagnosis) is the primary tool to achieve results of therapeutic success. Unfortunately, this is only possible in countries with health care systems that can effectively cover the entire territory and where hygienic and life conditions are acceptable, while often it is not possible in developing countries such as Africa or parts of Asia and South America. It is no coincidence that these regions or continents are today among the main centers of infectious diseases with high mortality rates. Another not insignificant aspect is the resistance that the etiological agents have developed to antibiotics. An important example is the tuberculosis. In addition to all, this must be considered also the resistance to pesticides by many carriers (mosquitoes, fleas, snails, flies). As mentioned infectious disease needs many convenient components to occur. The recent outbreak of plague in Madagascar summarizes all these points.

THE PLAGUE IN MADAGASCAR

As well known the plague is caused by the Enterobacteria *Yersinia pestis*. The transmission of the infection is possible by any of the following means: droplet contact, direct physical contact, indirect contact, airborne transmission, fecal-oral transmission, or vector borne transmission. In this last modality a particular role is due to rodents. The plague is mainly a disease in the fleas (*Xenopsylla cheopis*) that infested the rats. In comparison with the fleas the rats have a greater mobility in spatial terms and so they can spread the disease in extensive areas. The great outbreaks have always coincided with an increase in the population of rats. In this case, the human infection is part of a process where the infected flea bites a rat and infects it. Subsequently, the flea or more difficult the rat may directly affect the humans. The natural foci of plague are situated in a broad belt in the tropical and sub–tropical latitudes and the warmer parts of the temperate latitudes. According to the world health organization (WHO) [1] the area with greater risk factors is located between the parallels 55 degrees North and 40 degrees South. The most frequent types of plague are bubonic and pneumonic. The septicemic plague is often a result of the bubonic characterized by a very fast course, the patient may die in the same day when the symptoms appeared. Rarer forms are the meningeal plague that occurs when the Enterobacteria cross the blood-brain barrier and pharyngeal plague, both with clinical cases very low. The asymptomatic, abortive and cellulocutaneous plague are also very rare types.

In the February 2015, WHO and Madagascar's Ministry of Health supported by experts from the Plague Central Laboratory at the country's Institute Pasteur have completed an accurate investigation of the plague situation in Madagascar. In about a year (September 2014 – April 2015), there have been 263 cases including 71 fatal (WHO data). The central highlands have been the most heavily affected area. Principally cases of pneumonic plague continued to be reported. The problem is that this area is difficult to supervise in terms of health. The result is that often the diagnosis is effected with delay and the pharmacological therapy can reveal late and therefore ineffective. Unlike the epidemic of 1998 in which there were two strains one resistant to ampicillin and another to chloramphenicol [2], if administered early the response to antibiotics conventionally suggested by WHO (tetracyclines, streptomycin and gentamycin) it was good. Treatment with common antibiotics are efficient on plague but their efficacy depends on the early

Mauro Rubini
Affiliations: Foggia University, Italy.
Corresponding Author: Mauro Rubini, Foggia University, Italy.

Received: 31 May 2015
Published: 03 September 2015

detection. The case fatality can be reduced from 60% to less than 15% for example in bubonic plague. Obviously this is also very important in the pneumonic form, which shows high pathogenicity. It can kill in less than 24 hours, and in the absence of treatment it is invariably fatal. Another parameter that makes it difficult to control the plague in Madagascar is represented by environmental-climatic conditions. Heavy rains, flooding and tropical storms produce in a country such as Madagascar, which has huge infrastructure problems, the difficulty of effectively monitoring the area, resulting in increased cases often fatal. Finally, the control of plague outbreak in Madagascar has been complicated by another important factor the development of resistance to deltamethrin (an insecticide) in the fleas that transmit the disease from rats to humans. This disadvantage has diminished the potential environmental defense against the plague in a country where the amount of medicine should encourage a better quality of life by improving the social and health conditions. The mortality curve (M_x = death rate for the elementary age interval) shows (Figure 1) a greater involvement with an important peak of the age class 20–29 years, while another peak is present but less important is present in the age class 5–9 years. This sinusoidal trend is characteristic of the plague outbreaks in the past as today. Probably, the greater involvement of these two age groups is random because the plague affects all age classes and both sexes equally.

Although until 2007 the plague was one of the three epidemic diseases specifically reportable to the WHO (with the cholera and yellow fever) today the constant presence of it (since 1980) in Madagascar brought back to international attention the problem of re-emerging infectious diseases. The aim of this editorial is to draw the attention of the health community to the problem of infectious diseases often quiescent but not eradicated and sometimes forgotten by scientific research.

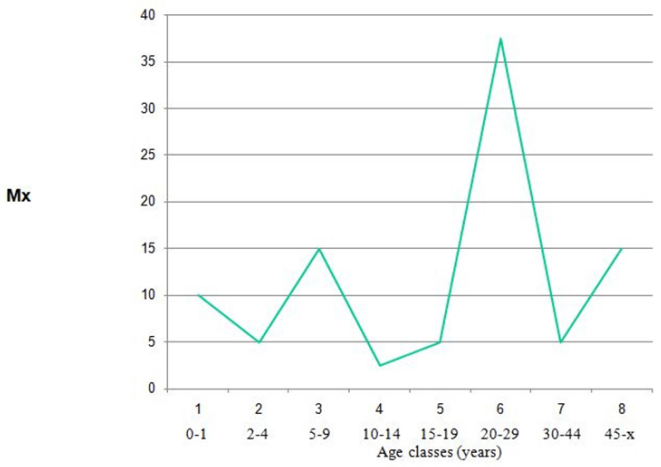

Figure 1: Mortality trend for age classes.

Keywords: Infectious diseases, Madagascar, Pathogens, Plague

How to cite this article

Rubini M. Emerging pathogens: The plague in Madagascar. Edorium J Infect Dis 2015;2:1–3.

Article ID: 100002I03MR2015

****

doi:10.5348/I03-2015-2-ED-1

****

Author Contributions

Mauro Rubini – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

Copyright

REFERENCES

1. Plague Manual: Epidemiology, Distribution, Surveillance and Control; World Health Organization; Communicable Disease Surveillance and Response. pp. 9 and 11. [Availabe at: http://www.who.int/csr/resources/publications/plague/whocdscsredc992a.pdf]
2. Chanteau S, Ratsitorahina M, Rahalison L, et al. Current epidemiology of human plague in Madagascar. Microbes Infect 2000 Jan;2(1):25–31.