

ORIGINAL ARTICLE

Epidemiology of the 2016 Cholera Outbreak of Chibombo District, Central Zambia

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ABSTRACT

Background: The first outbreak of cholera in Zambia was reported in 1977/1978, and then cases appeared again in 1982/1983. The first major outbreak occurred in 1990 and lasted until 1993. Since then, cholera cases have been registered every year except in 1994 and 1995. Generally most cases were recorded in the fishing camps of the rural areas and in the peri-urban areas of Lusaka and Copperbelt provinces. There is no documented evidence of previous cholera outbreaks in Chibombo district. An outbreak of cholera occurred in this area in 2016. The aim of the study was to document the epidemiological features of this outbreak

Methods: We used routine data of suspected and confirmed cholera cases in this area which covered the period from 09th February to 20th March 2016. Available information on the patients included stool culture results, household, sex, and age. Descriptive analysis involved the frequency of the various variables as percentages.

Results: A total of 23 suspected and confirmed cases were seen at the district health facility. Thirteen of the cases (57%) were from the same catchment area of which 4 (31%) were from the same household. Of these 10 were female. Of these 20 (87%) were adults and 3(13%) were children. Stool culture results were available for 18 (78%) of which 8 (45%) were positive for vibrio cholera. Of the cases that tested positive the index case was identified as a 62 year old woman who had travelled from an area experiencing an outbreak in Lusaka. On the other hand, of the 11 water samples available 2 (18%) were found to

have faeces coliforms contamination. All patients were treated with ciprofloxacin and intravenous fluids. There was no related mortality.

Discussion: This was an imported outbreak with the index coming from an area experiencing an epidemic in Lusaka. Possible sources could have included water contaminated with faeces matter. There is need to raise awareness of cholera transmission whenever the country is experiencing outbreaks of cholera.

Conclusion: Even areas that have never experienced cholera outbreaks are at risk and there is need to raise awareness.

INTRODUCTION

The first outbreak of cholera in Zambia was reported in 1977-1978, and then cases appeared again in 1982-1983. The first major outbreak occurred in 1990 and lasted for three years. Since then, cholera has become endemic with cases being registered every year except in 1994 and 1995. Generally most cases are recorded in the fishing camps of the rural areas and in the peri-urban areas of Lusaka and Copperbelt provinces.

Cholera is an acute secretory watery diarrhoea caused by the Gram-negative bacterium *Vibrio cholerae*, with 01 and 0139 types being the principal ones associated with epidemics and they thrive wherever crowded housing conditions exist and water and sanitary conditions are suboptimal.^{1,2,3,4} It's transmitted by the faeco-oral route. Although most cholera infections are not detected, large cholera outbreaks, such as those seen in Haiti, Vietnam and Zimbabwe in recent years, can occur. Industrialized countries have seen practically no cholera cases for over a

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century because of their good water and sewage treatment infrastructure, though it remains the significant cause of illness and death in many African countries.^{5,6,7}

In the twenty-first century, sub-Saharan Africa bears the brunt of global cholera, with a high mortality rate.⁸ During 2011, WHO participated in the verification of 37 outbreaks in 30 countries, of which 25 occurred in Africa. In 2014, a total of 42 countries from all continents reported 190 549 cases of cholera to WHO, of which 55% were reported from Africa. The objective of the study was to investigate and document the epidemiological features of this cholera epidemic in Chibombo district

METHODOLOGY

Following an increase in the number of cases of patients presenting with diarrhoea and vomiting in Chibombo district, a suspicion of cholera was entertained and a cholera centre opened. A case of cholera was defined as any person admitted to the cholera treatment centre with acute watery diarrhoea, with or without vomiting. Demographic information on suspected cases was reviewed. These included age, sex, people with similar symptoms in their households and history of travel. Laboratory investigations were conducted on stool samples using SD Bioline-Cholera Ag 01/01/39 Rapid Diagnostic Test (RDT) was conducted and water samples was conducted. Descriptive analysis involved the frequency of occurrence of the various variables as percentages.

Chibombo district is situated in about 80 km from Lusaka and 60km from Kabwe towns. The district has 27 health facilities managing a total population of 227,786. Twalumba Rural Health Centre was the focus for the outbreak with a catchment area population of 5,688.

RESULTS

The total number of cases seen at the centre was 23, of which 13 (57%) were from the same area and within this area, 4 (31%) were from the same household. Out of the total number seen, 10 (43%) were female, 13 (57%) were male, 20 (87%) were adults and 3 (13%) were children. There were no facility or community deaths recorded.

Out of the total number of cases, 18 (78%) had stool culture done, out of which 8 (45%) were culture positive. The vibrio was sensitive to ciprofloxacin, of the RDTs done, 4 were positive. During contact tracing, poor sanitary conditions were observed, with many people using same toilet, mono pumps available but catering for many households. Two (18%) out of the eleven water samples were contaminated with faecal coliform.

DISCUSSION

This public health event in Chibombo district was an imported case from Lusaka where there was an ongoing cholera outbreak. Altogether 23 people of family clusters were affected. The transmission of the disease was largely linked to unsafe drinking water, inadequate poor sanitary facilities and lack of awareness of cholera by communities.

There was limited spread of disease among clusters of people and family members indicating poor sanitary and food hygiene conditions. Sanitary facilities are shared among families with approximately eight families sharing on average one pit-latrine. Water contamination with faecal coliforms was confirmed in nearly 20% of tested water samples. There were no deaths recorded at the facility and in the community during the outbreak. This could be attributed to prompt case detection, reporting and management, as a result of high levels of community awareness.¹¹ However; many deaths due to cholera have been reported from other places.^{12,13}

CONCLUSION

It is clear that several factors might have contributed to the emergence of cholera outbreak in Chibombo. It is highly likely that the following factors could have contributed to emergence of the current outbreak; increased human movement; inadequate safe drinking water and sanitation including low levels of awareness about the disease by communities. There is a need to shift the emphasis from response to prevention in order to avert outbreaks by expanding access to improved sources of drinking water and improved sanitation, and by working with communities to encourage behavioral change to eliminate the risks of infection^{21,22}.

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REFERENCES

1. Morris, J.G. Jr. Cholera and other types of vibriosis: a story of human pandemics and oysters on the half shell. *Clin Infect Dis.* 2003; 37: 272–280
2. Greenough, W.B. III. The human, societal, and scientific legacy of cholera. *J Clin Invest.* 2004; 113: 334–339
3. Nelson, E.J. Harris, J.B. Morris, J.G. Jr. Calderwood, S.B. and Camilli, A. Cholera transmission: the host, pathogen and bacteriophage dynamic. *Nat Rev Microbiol.* 2009; 7: 693–702
4. World Health Organization. Cholera vaccines: WHO position paper. *Wkly Epidemiol Rec.* 2010; 85: 117–128
5. Chao, D.L. Halloran, M.E. Longini, I.M. Vaccination strategies for epidemic cholera in Haiti with implications for the developing world. *Proc Natl Acad Sci USA* 2011; 108: 7081-5.
6. World Health Organization. Outbreak news – severe acute watery diarrhoea with cases positive for *Vibrio cholerae*, Viet Nam. *Wkly Epidemiol Rec* 2008; 83: 157-8.
7. Zimbabwe: OCHA Cholera Update Situation Report No. 22, New York: United Nations Office for the Coordination of Human Affairs; 2012.
8. Centers for Disease Control and Prevention. Cholera, 2011.
9. Gaffga, N.H. Tauxe, R.V, Mintz. E.D. Cholera: a new homeland in Africa? *Am J Trop Med Hyg.* 2007;77:705-13.
10. World Health Organization. Cholera 2011. *Wkly Epidemiol Rec.* 2012;87: 289–304.
11. World Health Organization. *Addressing sex and gender in epidemicprone infectious Diseases.* Unpublished manuscript, Geneva, 2007.
12. Todar K. *Todar's Online Textbook of Bacteriology,* 2010.
13. Ali, M, Lopez, A, You, Y. Kim, Y. Sah, B. Maskery, B. Clemens, J. The global burden of cholera. *Bull World Health Organ.* 2012;90:209-18.
14. Harris, J.B., LaRocque, R.C., Charles, R.C., Mazumder, R.N. Khan, A.I. and Bardhan, P.K. Cholera's western front. *Lancet.* 2010; 376: 1961–1965
15. Deen, J.L. von Seidlein. L. Sur, D. Agtini, M. Lucas. M.E.S. Lopez, A.L et al. The high burden of cholera in children: Comparison of incidence from endemic areas in Asia and Africa. *Trop Dis* 2008; 2: 173- 175