ORIGINAL ARTICLE

Increased Sensitization of Health Workers Leading to Detection of Unintended Cases of Acute Flaccid Paralysis: A Case of a "Konzo" Outbreak in Western Zambia

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ABSTRACT

Background: The threat of high profile diseases causing outbreaks has drawn attention to public health surveillance systems, much needed for the timely detection of outbreaks. A disease characterized by weakness of the lower limbs in Luatembo rural health facility was reported to the province in 2013. Through the Acute Flaccid Paralysis surveillance (AFP) program the Western Province in Zambia recorded an increase in the numbers of people affected with spastic paraparesis. The disease affected clusters of families, especially women and children. The disease was found to be in specific geographic areas, with the initial cases being identified in Mongu district followed by Luampa and Senanga districts. Surveillance for a particular disease condition may sometimes lead to detection of a related or unrelated condition. This study aims to assess the sensitivity of the Acute Flaccid Paralysis surveillance program surveillance program to detect other diseases of public health importance using the suspected 'Konzo' outbreak in Western Province as a case study.

Methods: Through the surveillance system and medical records review, patients with spastic paraparesis were identified and brought for clinical examination to selected health facilities. A team of specialists comprising of an infectious disease specialist and neurologist, supported by physiotherapists, epidemiologist, surveillance officers and laboratory scientists comprehensively investigated the cases. To improve the diagnosis a detailed case investigation form and checklist were used to capture clinical data and socio demographic information.

Laboratory investigations included routine urine microscopy and full blood count. Further analysis included viral analysis for enteroviruses, cytomegalovirus among others, copper levels and thiocyanate levels.

Results: Preliminary laboratory results indicated no viral infections. Thiocyanate and copper levels are yet to be analysed.

Discussion: As a result of the increased sensitization of health workers and communities, more cases were reported in other parts of Western Province, namely Luampa and Senanga districts. All the cases were detected through active surveillance for AFP. This study indicates a potential role for integrating AFP surveillance with other notifiable diseases within the integrated disease surveillance and response for early notification of unusual events in the community and community involvement to foster health seeking behaviors.

Conclusion: This paper reflects on the role of AFP surveillance in integrated disease surveillance and response that resulted in the detection of an uncommon spastic paralysis 'Konzo' disease in Mongu, Western Province.

INTRODUCTION

Public health surveillance is a monitoring tool that involves systematic collection, analysis and interpretation of data about health related occurrences of public health significance. This system helps in case detection of potential and monitoring public health interventions[1]. Early warning of potential threats, outbreak detection, detection of new diseases, and changes in epidemiology of endemic diseases through program monitoring are some of the benefits obtained through a good surveillance system[2]. The timely warning functions of health security be it at national, regional or global level cannot be overemphasized. Recent outbreaks including severe acute respiratory syndrome, Pandemic H1N1v, Ebola and now Zika underscore the need to invest in effective national surveillance and response systems[2,3]. Various disease specific surveillance programs with different programmatic goals exist globally including Influenza surveillance, Measles surveillance and acute flaccid paralysis surveillance. Through the 1988 World Health Assembly resolution to eradicate poliomyelitis a sensitive global surveillance system was established. As AFP surveillance systems matured, countries increasingly applied the AFP structure and system to detect other priority diseases, mostly measles and other vaccine-preventable diseases. In the WHO African Region, AFP surveillance provided the nucleus to develop an "Integrated Disease Surveillance and Response" (IDSR) system for priority infectious diseases[4]. A sensitive and effective surveillance system should be able to detect potential health threats timely[3, 5]. Through active AFP surveillance, Zambia detected an ongoing increase in the number of persons presenting with spastic paraparesis.

All countries are mandated through the International Health Regulation 2005 legal framework to develop and maintain surveillance systems so as to enable timely detection and containment of outbreaks. A poor surveillance system may cost a country and even multination in the event of an infectious disease. In 2002, the first cases of Severe Acute Respiratory Syndrome (SARS) were not recognized as a potential threat and not reported to WHO as per IHR mandate. The disease spread causing deaths and spread to another country causing a global threat[4,6]. Shortcomings in the surveillance system overlooking the control of schistosomiasis in China have been recognized as reason for detecting the reemergence of the disease timely. The WHO emphasizes the importance of ongoing surveillance before, during and after any program interventions[7]. An integrated approach built on AFP surveillance in the context of IDSR in many developing countries has increased the sensitivity of the surveillance system to detect other diseases beyond AFP by providing functional infrastructure, trained personnel and other resources. This approach has facilitated the detection and investigation of diseases such as SARS, cholera, dengue, Rift Valley fever, shigellosis, hemorrhagic fevers, meningitis, and malaria[8].

As AFP surveillance systems matured, countries increasingly applied the AFP structure and system to detect other priority diseases, mostly measles and other vaccine-preventable diseases.Outbreaks typically have been recognized either based on accumulated case reports of reportable diseases or by clinicians and laboratories' who alert public health officials about clusters of diseases[8]. We document in this study how an adequate and sensitive AFP surveillance system enabled the detection of unintended cases of Acute Flaccid Paralysis.

METHODOLOGY

In September 2013, Mongu district reported 7 AFP cases from 3 different locations within the same geographical area. Stool specimens were collected and sent to UTH Virology Laboratory for investigation for suspected poliomyelitis.

On 60 days follow up from the date of onset of paralysis of the first three cases from Luandui as per standard guidelines for AFP surveillance, an increased number of persons presenting with spastic paraparesis which turned out to be non- polio and non entero virus were detected and the district medical office notified authorities 2013. In 2015, having noted a continued trend of these cases, the national level was notified. A team of specialists comprising of an infectious disease specialist and neurologist, supported by physiotherapists, epidemiologist, surveillance officers and laboratory scientists comprehensively investigated the cases. Through the surveillance system and medical records review, patients with spastic paraparesis were identified and brought for clinical examination to selected health facilities for further investigations to determine the cause of this etiology. Physical examinations were conducted and specimen collected for laboratory investigations. To improve the diagnosis a detailed case investigation form

and checklist were used to capture case history, clinical data and socio demographic information. The laboratory investigations were carried out to rule out infectious process and suspected 'Konzo'.

RESULTS

In 2013 Findings were that three (3) clients in Luandui had all debilitated and one of them was unable to walk anymore and had stopped going to school. In Lwatembo (Kaote Village), the 3 clients had also debilitated. During this follow up visit, 8 more clients were discovered that had not previously reported to the facility, bringing the total number of clients in Lwatembo to 11.

In 2015, the national team identified through the surveillance system and health facility record reviews identified a cumulative 80 cases of paralysis with unknown etiology. Of all investigated, 35 persons met the criteria of spastic paraparesis of unknown etiology on physical examination and determination of socio-demographic characteristics.

Mostly affected were children between 3 – 12 years and a number of young ladies whose onset started during the breastfeeding period.

Preliminary laboratory results indicated no viral infections. Thiocyanate and copper levels are yet to be analysed.

DISCUSSION

Spastic paralysis cases were reported in Mongu district from 2013 onwards affecting mostly children between 3 – 12 years and women with history of onset during breastfeeding. Occurrence of this condition has not been recorded in the history of the Zambian health system. Similar cases have been reported in Zaire in 1936, Burundi in 1937 and Mozambique in 1981.

Polio is earmarked for global eradication. Active case search of suspected polio is done through identifying all cases less than 15 years with Acute Flaccid Paralysis and if highly suspicious by the clinician even in older people. Any disease eradication initiative relies on highly sensitive surveillance to guide programmatic action. This is especially important for polio eradication, since only one out of 200 infections with poliovirus results in clinically apparent paralytic disease. To identify and eliminate the remaining pockets of wild poliovirus transmission, surveillance must detect and investigate as many cases of paralytic poliomyelitis as possible[2,9].

Using the concept of active surveillance, regular visits to health facilities are carried out during which registers are reviewed to determine the type of cases admitted or seen at the facilities and clinician sensitization is carried out[2]. Thus all cases with sudden onset of paralysis or weakness are investigated by taking stool specimens to the WHO accredited laboratory (UTH Virology laboratory) to map the virus and to determine the origin of the virus strain.

'Konzo' is characterised by abnormal walking, stiffness of the legs and a permanent paralysis.'Konzo' is distinct from polio which is a flaccid paralysis and most often affects a person asymmetrically[10]. However, in view of its rare nature, cases seen in Western Province were suspected to be polio because health workers have been sensitized to detect AFP cases to investigate for polio which is a necessary component of polio eradication. When the suspected cases of suspected 'Konzo' disease presented to the health facility with paralysis, health workers concluded that they were cases of AFP. Stool specimens were taken for investigation at the UTH Virology laboratory and the results came out negative for wild polio virus. This was followed by the standard 60 day follow up. It was during the 60 day follow up that more cases were discovered and reported to the Mongu district health authorities.

The WHO Publication on Spastic Paraparesis in Mozambique published in 1984 states that people contract 'Konzo' by consuming poorly processed bitter cassava, a drought-resistant staple food in much of sub-Saharan Africa. Typically, the plant's tuber is soaked for a few days, then dried in the sun and ground into flour – a process that degrades naturally occurring cyanide. "But in times of war, famine, displacement and hardship, people take shortcuts thereby cutting short the period of processing. If they're subsisting on poorly processed cassava and they don't have other sources of protein, it can cause permanent damage to the nervous system[10].

It has been learnt that in some parts of Mongu district, poverty levels seemed to be quite high which resulted in reduction of the period of processing of cassava from between 7 – 14 days to 3 days due to hunger in the area.There is information that there was drought in the area during 2013.

Preliminary findings exclude an infectious process in all the cases. Although not yet laboratory confirmed there is heavy suspicion of these cases being linked to 'Konzo' as they meet the clinical criteria.

As a result of the increased sensitization of health workers and communities, more cases were reported in other parts of Western Province, namely Luampa and Senanga districts. All the cases were detected through active surveillance for AFP. The AFP surveillance system in Zambia is sensitive and effective in detecting other diseases of importance. This paper reflects on the role of AFP surveillance in IDSR that resulted in the detection of an uncommon spastic paralysis 'Konzo' disease in Mongu, Western Province. However, limited use of surveillance data is reflected in this investigation process. It is fortunate the disease is not contagious as it would have resulted in a large epidemic. This weakness is noted in other outbreak setting such as the SARS epidemic in 2003, Influenza H1N1v in 2009 and the recent ebola outbreak in West Africa[4, 11-13].

CONCLUSION

The system was able to detect an uncommon spastic paralysis 'Konzo' disease in Mongu, Western Province. AFP surveillance in Zambia in the context of integrated disease surveillance and response is sensitive enough to identify unintended cases of AFP.

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