Invasive meningococcal meningitis serogroup C outbreak in northwest Nigeria, 2015: third consecutive outbreak of a new strain

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Introduction

In northwest Nigeria in 2013 and 2014, two sequential, localised outbreaks of meningitis were caused by a new strain of *Neisseria meningitidis* serogroup C (NmC). In 2015, an outbreak caused by the same novel NmC strain occurred over a wider geographical area, showing different characteristics from the previous outbreaks. We describe the characteristics and epidemiology of the 2015 outbreak.

Methods

From 10 Feb to 8 June 2015, data on cerebrospinal meningitis (CSM) cases and deaths were recorded on standardised line-lists from case management sites supported by MSF. Cerebrospinal fluid (CSF) samples from suspected cases at the beginning of the outbreak and from suspected cases from new geographical areas throughout the outbreak were tested using rapid Pastorex® latex agglutination to determine causative serogroup. Some of these CSF samples were inoculated into Trans-Isolate medium for testing by the WHO Collaborating Centre for Reference and Research on Meningococci, Oslo. Reactive vaccination campaigns with meningococcal ACWY polysaccharide vaccine targeted affected areas.

Ethics

This retrospective study met the criteria of the MSF Ethics Review Board for exemption from ethics review.

Results

A total of 6394 (65 confirmed and 6329 probable) cases of CSM, including 321 deaths (case fatality rate 5.0%), were recorded. The cumulative attack rate was 282 cases per 100,000 population in the areas affected. The outbreak lasted 17 weeks, affecting 1039 villages in 21 local government areas in three states (Kebbi, Sokoto, Niger). Pastorex® tests were NmC positive for 65 (58%) of 113 CSF samples. Of 31 Trans-Isolate medium samples, 26 (84%) tested positive for NmC (14 through culture and 12 through PCR); all had the same rare PorA type P1.21-15,16 as isolates from the 2013 and 2014 outbreaks. All 14 culture-positive samples yielded isolates of the same genotype (ST-10217 PorA type P1.21-15,16 and FetA type F1-7). More than 222,000 targeted individuals were vaccinated relatively early in the outbreak (vaccination commenced 4 and 6 weeks after initial case detection with administrative coverage estimates of 98% and 89% in Kebbi and Sokoto, respectively).
Conclusion

The outbreak was the largest caused by NmC documented in Nigeria. Reactive vaccination in both states may have helped to curtail the epidemic. Serogroup and strain should be verified in future outbreaks of *N. meningitidis* to monitor for possible serogroup replacement following the success of MenAfriVac vaccination against NmA. A vaccination campaign against NmC with a long-lasting conjugate vaccine should be considered in the region.

Conflicts of interest

None declared.