SETTING STANDARDS IN ACCURATE LABORATORY DIAGNOSIS OF CEREBROSPINAL MENINGITIS

In Nigeria and other sub-Saharan African countries, Cerebrospinal Meningitis (CSM) is still a major public health concern. The disease is highly fatal and about 5% to 10% of patients die 24-48 hours after the onset of the symptoms. Several bacteria can cause meningitis but *Neisseria meningitidis* is the pathogen with the potential to cause large epidemics. Laboratory diagnosis and testing are of paramount importance to identify which of the six strains of *Neisseria meningitidis'* is responsible for the infection before treatment can commence.

In previous times, cases of CSM were treated with broad-spectrum antibiotics, without proper laboratory investigation to direct the course of treatment. This poor practice can be linked to the mutation of the *Neisseria meningitidis* strain A to *Neisseria meningitidis* strain C in recent years, which has led to outbreaks of CSM. For Dr. Ali Amina Yusuf, a house officer with the Pediatric Medical Ward at Specialist Hospital, Sokoto, care and treatment of patients with CSM has been a very disheartening and challenging process.

"Prior to now, we lacked the specialized skill set and equipment needed for diagnosing CSM. Many patients would die despite prolonged treatment because we were treating one thing while the patient was suffering from something else"

- Dr. Aminatu

In 2016, Nigeria was hit by an outbreak of Cerebrospinal Meningitis. The first case was reported in Zamfara in December 2016. By June 2016, there had been a total of 14,518 cases and 1,166 deaths across 25 states. The Sokoto- Kebbi- Zamfara tri-state area was the worst hit by this outbreak, accounting for over 89% of the cases.

In response to the outbreak, eHealth Africa in collaboration with the International Foundation Against Infectious Diseases in Nigeria (IFAIN) and the Sokoto State Ministry of Health (SMoH) deployed the Sokoto Meningitis Laboratory to handle the testing of cerebrospinal fluid (CSF) samples collected from patients with suspected cases of CSM in this tri-state area. eHA constructed the lab and currently manages the facility and coordinates lab operations and sample transportation from health facilities across local government areas in the Sokoto metropolis. IFAIN provides the reagents, technical support and laboratory machines including the Bactec 9050 for blood culture, while the SMoH provides the manpower (Medical Lab Scientists and Technicians). Some testing kits - Pastorex and lumbar puncture (LP) kits are also provided to the Lab by the World Health Organization via the SMoH.

"This lab is unlike anything we have ever had in this region and efforts have to be put in place from the Sokoto State Ministry of Health in order to ensure our people maximize such rare opportunity."

The establishment of the Sokoto Lab has triggered the State Ministry of Health to build the capacity of medical officers across the state on proper techniques of sample collection including lumbar puncture, aseptic blood collection, and media inoculation techniques. In addition, periodic sensitization activities are conducted to ensure that medical officers inculcate the habit of disease investigation before administering appropriate treatment.

Since inception, the Sokoto Lab has tested nearly 1000 CSF and blood samples taken from patients with symptoms of Meningitis and 93 have been confirmed positive.

"Who knew that such a variety of pathogens existed in Sokoto? Thanks to the Sokoto Meningitis Lab, we are able to correctly isolate the causative agent behind any meningitis infection. This has also helped us to tailor courses of treatment to the specific microorganism. Hopefully, this will translate to lesser cases of CSM."

The Sokoto Lab also contributes to progress towards halting the spread of antibiotic-resistant pathogens by isolating and detecting other disease-causing organisms apart from *Neisseria meningitidis*. Now more than ever, citizens of Sokoto, Kebbi and Zamfara states can be assured of quality and effective laboratory diagnosis before treatment.