Isolation and Characterization of Neisseria Meningitidis Implicated in an Outbreak of Meningitis in West Pokot District, Kenya and South Sudan – April 2006

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Meningococcal disease is an acute bacterial infection caused by Neisseria meningitidis and is characterized by sudden onset with fever, intense headache, nausea, vomiting, stiff neck and confusion. Formerly, the case-fatality ratio exceeded 50%, but early diagnosis, modern therapy, and supportive measures have lowered the case-fatality ratio to about 10% in developed countries. Among survivals, 11-19% develops long-term sequelae, including hearing loss, neurological disability or limb loss. Meningococcal meningitis occurs globally and is usually sporadic, but occasionally breaks into devastating epidemics. There are 12 sero-groups of N. meningitidis but only 4 cause epidemics. In African meningitis belt and in eastern African region, 90% of the recurrent meningococcal meningitis epidemics are caused by sero-group A and C. In the past 20 years, other sero-groups such as Y, X or W135 have been detected in the West African countries. Between January and April 2006, there was meningitis outbreak in West African Countries (Burkina Faso & Niger) also in the eastern Africa region including Uganda, southern Sudan and Kenya. These outbreaks may be associated with mutation or new circulating N. meningitidis strains. The main aim of this study was to isolate, carry out antimicrobial susceptibility test and characterize N. meningitidis from cerebrospinal fluid (CSF) specimens of patients from West Pokot Kenya and southern Sudan in order to understand the diversity of the circulating strains for effective management. The specimens from the field were collected in Trans-Isolate Media and plain sterile test tubes then transported to the AMREF Laboratory at room temperature for culture on solid media. Molecular typing by PCR of all the CSF specimens was performed and characterization by Multi-locus Sequence Typing (MLST) was carried out for the CSF specimens that showed growth (positive culture). The specimens were analyzed at the AMREF laboratory and at the U.S. Naval Medical Research Unit No.3 (NAMRU) in Cairo, Egypt. The study results showed the first outbreak of sero-group X meningococcal disease in Kenya; whereas the isolates from southern Sudan were of
sero-group A, meningococcal meningitis. The most affected age group was children under 10 years in both countries. Also the study showed that the *N. meningitidis* strain in Kenya had resistance to sulphanomide drug whereas the strain in southern Sudan showed intermediate susceptibility. Molecular epidemiology is recommended for recognizing new strains in outbreaks and determining the suitable vaccine. This may call for inclusion of sero-group X in the new vaccine.