Cerebrospinal meningitis: lessons learnt from Africa

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Pere Domingo and colleagues[1] reviewed two centuries of struggle against meningococcal disease, from the discovery of the bacterium to current management and preventive measures. We would like to enrich this interesting Review with additional breakthroughs made in Africa from the 1950s to the 1970s, which helped people to face the health disaster of epidemic meningitis in sub-Saharan countries.

In the meningitis belt, initially described by Lapeyssonnie,[2] meningococcal disease was endemoepidemic, with huge seasonal outbreaks in the first months of the year causing up to 1000 cases per 100 000 inhabitants. In remote places with a poor and inconsistent medical supply, mortality was very high, especially in the youngest children, which had a strong effect on society (appendix). To address this issue, an innovative public health approach was developed in the 1960s to treat patients with single-dose sulfamethoxypyridazine, administrated by local caregivers according to well designed protocols.[3] After the emergence of resistance to sulfamethoxypyridazine, oily chloramphenicol became the best option, fulfilling pharmacological and bactericidal criteria. Oily chloramphenicol was rapidly shown to be highly efficient in sub-Saharan Africa, saving numerous lives for decades after its WHO recommendation in the late 1970s.[4,5] This drug was replaced in 2004 by single-dose ceftriaxone, which is as efficient as oily chloramphenicol, cheaper, and widely available.[6]

See Online for appendix

The other major progress in controlling massive epidemics of cerebrospinal meningitis A and C in Africa was the development and industrial production of a bivalent polysaccharide vaccine, and its widespread use starting as early as possible after the epidemic onset. Pragmatic mass trials in Africa and Brazil conducted by Mérieux and others showed the feasibility and efficacy of this vaccine strategy.[7]

Based on an efficient surveillance and alert system, mass vaccine campaigns and early single-dose treatment remain the most efficient public health tools against meningococcal disease in sub-Saharan Africa. For the Review by Domingo and colleagues[1] to be complete, these two Africa-developed advances must be put into the limelight as well as the other advances mentioned.

This omission might be due to the frequent scotoma on francophone scientific publications by medical search engines and readers who do not speak French. This language bias has been recently acknowledged in a Comment by Anne Roca and colleagues in *The Lancet Global Health*.[8]

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Melioidosis

In their Review, Emma Birnie and colleagues[1] discussed the global burden of melioidosis, which is a treatable infectious disease with several grave consequences. They based their findings on global incidence and mortality due to melioidosis. However, their findings are based on a small number of patients whose deaths were attributed to the disease without them having been diagnosed with it. A study[2] reported that only four people were diagnosed with melioidosis in the Odisha state, India, between 2008 and 2014. However, in the past 5 years over 100 people have been diagnosed at our center.

Timely diagnosis and appropriate treatment of melioidosis could save many lives and increase quality of life for numerous people. We add a few points to the review by Birnie and colleagues.[1]

First, melioidosis can present with highly atypical features, including isolated mediastinal lymphadenopathy and deep-organ abscess; therefore, it could be misdiagnosed as tuberculosis or lymphoma. To establish a diagnosis, at the All India Institute of Medical Sciences, Bhubaneswar, India, we sometimes have to resort to an invasive sampling method, such as endobronchial ultrasound (EBUS)-guided needle aspiration.

Such cases might be accompanied by bacteraemia and the diagnosis is entirely dependent on the EBUS aspirated material.

Because of the low sensitivity of culture (60%), the use of non-culture methods with high sensitivity is desirable.[3] We use an active melioidosis detect-lateral flow assay (InBios International, Seattle, WA, USA) as an adjunct test to culture at our centre. This test has been shown to have optimal sensitivity and specificity, and has the potential to be used as a point-of-care test for early diagnosis of melioidosis in resource-constrained settings.[4] A study[5] on a lateral flow recombinase polymerase amplification assay showed that it was a good alternative to the traditional PCR-based test.

The ability of clinicians to notice subtle signs of melioidosis and quickly communicate their clinical suspicion of the disease to microbiologists is the key to rapid diagnosis. Clinicians' suspicion helps judicious use of specific media, automated culture, and identification in a resource constrained country.

In addition to raising awareness among clinicians and microbiologists about this disease and considering melioidosis as a neglected tropical disease,[1] we feel it is important to create country-specific melioidosis registries. These registries would contribute not only to improved patient care by providing readily accessible information and better understanding of the disease transmission but also be used for clinical research and prevention of this emerging disease.

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We read with interest Emma Birnie and colleagues' Article about the global burden of melioidosis in 2015.[1] However, they did not mention the burden of the disease in the Caribbean islands, where cases have been reported although it is not a major endemic region.[2]

Martinique is a 1000 km² island in the French West Indies (ie, Martinique, Guadeloupe, Saint-Martin, Saint-Barthélémy), with 390 000 inhabitants. We have treated 14 patients with melioidosis in our hospital since 1993, including six who died from their disease. The mean age of those patients was 66 years (SD 13)—older than most patients with the disease in South and Central America[1]—and 13 (93%) were men. Neither excessive exposure to soil and water nor occupational exposure were reported. Four patients previously had type 2 diabetes, one previously had chronic kidney disease, five previously had excessive alcohol consumption, and six had cancer, which are usually not known to be risk factors.[3] The infections occurred mainly during the rainy season (11 of 14) and the incidence was approximately two times higher in years with excessive rainfall (nine of 14).

Burkholderia pseudomallei was isolated from the blood in 12 patients, from a joint or bone in two, from urine in one, and via bronchoalveolar washing in one. Four patients had a pulmonary form, two had a urinary infection, and three had soft-tissue abscesses.

For the eight patients who recovered, the mean duration of antibiotic therapy was 3·1 months (SD 3·8), with longer durations for musculoskeletal infections. Initial empiric antibiotic treatment was effective against *B pseudomallei* in only three of 14 patients, with *B pseudomallei* usually being resistant to antibiotics for community-acquired infections. Mortality was 43%, and of those who died, five had concurrent neoplasia.

All cases were diagnosed from cultures—the gold standard. Our hospital's bacteriological laboratory received all samples from the emergency units on our island, and we are the only reference centre for infectious diseases in Martinique.

Martinique is a touristic destination, thus melioidosis should be considered in people returning from the island. One additional case, a young traveller who developed fatal melioidosis after returning from Martinique in 2010, was reported by Gétaz and colleagues.[4]

Thus, although the Caribbean region is not a major endemic region, there is a melioidosis burden in West Indies.

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