Clinical evaluation of a loop-mediated isothermal amplification test for *Treponema pallidum pertenue*: a diagnostic tool to support yaws eradication

Find out more:

Dr Michael Marks, London School of Hygiene & Tropical Medicine
Dr Emma Harding-Esch, London School of Hygiene & Tropical Medicine
Becca Handley, London School of Hygiene & Tropical Medicine

What is the research?

This is a European and Developing Countries Clinical Trials Partnership (EDCTP) funded project running between 2020-2022 to evaluate the potential of a new diagnostic test for yaws. The project brings together the London School of Hygiene & Tropical Medicine (UK), the Noguchi Memorial Institute for Medical Research (Ghana), the Institut Pasteur (Côte d'Ivoire), the Centre Pasteur (Cameroon), Fundació Lluita contra la Sida i les Malaties Infeccioses (Spain), University of Göttingen, University of Freiburg and Mast Diagnostica (Germany). The fieldwork for the study will be conducted in sites across West and Central Africa. Patients suspected to have yaws will be enrolled into the study and we will compare the performance of standard polymerase chain reaction (PCR) assays performed at national reference laboratories with a novel loop-mediated isothermal amplification (LAMP) assay for the diagnosis of yaws. We will also work to develop a LAMP assay which can detect the presence of azithromycin resistance in yaws.

Why is this research necessary?

Yaws affects individuals in poor rural communities in Africa, Asia and the Pacific Islands. It mostly affects children and causes disfiguring lesions of the skin. If untreated it can progress to severe and irreversible lesions of the skin, soft tissues and bones resulting in disability and stigma. Recent developments using a single dose of oral azithromycin have renewed optimism that eradication can be achieved. However, diagnostics represent a major challenge for yaws eradication. Commonly used serological tests cannot differentiate current yaws from previous infection, nor differentiate yaws from other causes of similar skin lesions. Alongside this, the emergence of resistance to azithromycin makes clear the need for monitoring of drug resistance. There is therefore a need for an accurate point-of-care molecular assay to enable early detection and effective treatment of yaws and track progress towards eradication.

What is the research impact?

The project will strengthen laboratory capacity for monitoring yaws eradication in Africa. We will develop an external quality assurance scheme to support laboratory monitoring of yaws eradication efforts worldwide. If the novel LAMP assay performs well it will enable quicker diagnosis and treatment of yaws cases and importantly improve monitoring for the emergence of antimicrobial resistance. Building lab capacity will support national programmes in rolling out azithromycin mass drug administration and achieving the ultimate goal of yaws eradication.

About yaws:

Yaws is a chronic disfiguring and debilitating childhood infectious disease caused by *Treponema pallidum* subspecies *pertenue*.

The disease affects skin, bone and cartilage. Humans are currently believed to be the only reservoir, and transmission is from person to person.

There are 15 countries currently known to be endemic for yaws. Recently, three countries that were classified as previously endemic have reported suspected yaws cases.

Yaws is cured with a single oral dose of an inexpensive antibiotic called azithromycin.

World Health Organization 2019

Swab being collected from a yaws patient. Photo credit: Michael Marks