Medical Xpress

Genes hold key to heart disease prevalence in Africa

July 12 2021

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The clue to the risk of Africans developing rheumatic heart disease could be in the genes, paving the way for developing vaccines and treatments to control it, a study suggests.

The disease affects 40 million people globally but Sub-Saharan Africa accounts for nearly a quarter of cases, which occur particularly in children, women and adults aged 25 to 45 years, according to the study

published in *JAMA Cardiology* last month.

The disease, which usually starts as a sore throat, occurs because of the swelling and scarring of heart valves resulting from the bacterium Streptococcus pyogenes (group A streptococcus).

Researchers examined whether rheumatic heart disease is heritable and the genetic factors attributed to the increasing risk in Africans.

"This study is the first of its kind in [rheumatic heart disease] in Africa and provides a primer as to why it is more common in continental Africans," saysTafadzwa Machipisa, co-author and postdoctoral candidate in the department of medicine at the University of Cape Town, South Africa.

Researchers enrolled 4,809 Africans including 3,301 women in Kenya, Mozambique, Namibia, Nigeria, South Africa, Sudan, Uganda, and Zambia between December 2012 and March 2018. Of those, 2,548 had the disease and 2261 did not.

Scientists were able to link rheumatic heart disease to particular portions of a person's chromosomes, which carry genetic information, the study says.

Africans have certain genes specific to people from the region, as well as genes found in other populations, Machipisa tells SciDev.Net, which makes them more likely to have the disease including its severe cases.

"This shows why continental diversity is needed in large genetic studies, like inclusion of pan-African individuals as African genomes [genetic make-ups] are often more diverse than others," she explains.

There is no vaccine or effective therapy to prevent rheumatic heart

disease although injectable penicillin can be used to slow down its development, Machipisa, adds.

"Rheumatic heart disease is a major cause for cardiac surgery in Africa, mostly affecting young females," she says. "Genetics may help us better understand … rheumatic heart disease to develop the knowledge we need for vaccines, diagnostic markers, permanent, non-invasive or easy-to-use treatments."

Mark Engel, who is an epidemiologist and an associate professor at the University of Cape Town and a co-author of the study, says that general conditions associated with lower socioeconomic status such as lack of access to healthcare make the disease common in poor communities.

Engel adds that increased availability of over-the-counter medicines to treat symptoms of the disease such as swelling of sore throats make people less likely to go to the doctor or clinic, exacerbating their risk of serious illness.

"Improved clinical diagnostic tools are needed," he says.

Fatma Salim, a medical doctor at Kenya's Ministry of Health and a cardiologist, says many people do not know about rheumatic heart disease, making awareness creation critical.

She explains that in rural areas and some urban locations in Kenya, cases are missed due to lack of access to diagnostic machines and lack of adequate blood parameters to document or diagnose the cases.

"We have noted a prevalence of the disease in referral hospitals in urban areas most probably due to the availability of…machines and specialists," she tells SciDev.Net.

"But in other parts of Kenya [rural areas], to identify those with the disease is still a big challenge. People lack knowledge on the fact that recurrent infections such as common colds could worsen the disease or have no idea what the key presenting symptoms are and what to do in case one experiences them."

More information: Tafadzwa Machipisa et al, Association of Novel Locus With Rheumatic Heart Disease in Black African Individuals, *JAMA Cardiology* (2021). DOI: 10.1001/jamacardio.2021.1627

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