

Novel heart valve replacement offers hope for thousands with rheumatic heart disease

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Cape Town, South Africa 9 Sept 2016: A novel heart valve replacement method is revealed today that offers hope for the thousands of patients with rheumatic heart disease who need the procedure each year. The research is being presented at the SA Heart Congress 2016.

The annual congress of the South African Heart Association is held in Cape Town from 8 to 11 September 2016 and is jointly organised with the annual congress of the World Society of Cardiothoracic Surgeons. Experts from the European Society of Cardiology (ESC) will present a special programme.

"Over the past decade heart valve surgery has been revolutionised by transcatheter aortic valve implantation (TAVI)," said lead author Dr Jacques Scherman, a cardiac surgeon in the Chris Barnard Division of Cardiothoracic Surgery, University of Cape Town, South Africa. "Heart valves are replaced or repaired via a catheter, obviating the need for open heart surgery or a heart-lung machine."

He continued: "TAVI is only indicated in patients with calcific degenerative aortic valve disease, which is the most prevalent aortic valve pathology in developed countries. In developing countries, rheumatic [heart disease](#) still accounts for the majority of patients in need of a heart valve intervention."

Rheumatic heart disease is caused by rheumatic fever, which results from a streptococcal infection. Patients develop fibrosis of the [heart](#)

[valves](#), leading to valvular heart disease, heart failure and death. In Africa alone there are around 15 million patients living with rheumatic heart disease of whom 100 000 per year might need a heart valve intervention at some stage of their life. The vast majority of these patients have no access to cardiac surgery or sophisticated cardiac imaging.

Dr Scherman said: "Inspired by the success of TAVI for calcific aortic valve disease, we developed a simplified TAVI device for transcatheter aortic valve replacement in patients with rheumatic heart disease."

Currently available balloon expandable TAVI devices require the use of sophisticated cardiovascular imaging to correctly position the new valve. They also use a temporary pacemaker which allows the heart to beat so quickly that it stops blood circulating to the rest of the body (called rapid ventricular pacing).

Dr Scherman said: "Rapid ventricular pacing can only be tolerated for a short period and therefore limits the time available to do the implantation."

The team in South Africa developed a novel TAVI device which is "non-occlusive", meaning that there is no need to stop blood circulating to the body with rapid ventricular pacing. The device is also "self-locating" and does not require sophisticated cardiac imaging for positioning.

The proof of concept study presented today tested the device in a sheep model. The investigators found that the device was easy to use and positioned the valve correctly, and the procedure could be performed without rapid ventricular pacing.

Dr Scherman said: "We showed that this new non-occlusive, self-locating TAVI delivery system made it easy to perform transcatheter

[aortic valve replacement](#). Using tactile feedback the device is stabilised in the correct position within the aortic root during the implantation. It also has a temporary backflow valve to prevent blood leaking backwards into the ventricle during the implantation of the new valve. All these factors together allowed for a slow, controlled implantation compared to the currently available balloon expandable devices."

He added: "This simplified approach to transcatheter [aortic valve](#) replacement could be done in hospitals without cardiac surgery at a fraction of the cost of conventional TAVI. It has the potential to save the lives of the large numbers of rheumatic heart disease patients in need of valve replacement."

Professor Karen Sliwa, president of the South African Heart Association, said: "I am truly excited that we have not only an internationally strong group working on epidemiology and prevention of rheumatic heart disease at the University of Cape Town, but also a dedicated and successful surgical group, led by Prof. Peter Zilla at the Chris Barnard Department. Although prevention is the final goal, millions will need surgery as life-saving measure for decades to come. Knowing from my own Pan-African collaborations how inadequate the provision of cardiac surgery is on the African continent this fascinating solution promises surgical help for all these young patients with [rheumatic heart disease](#) on a continent that has a fair density of general hospitals but hardly offers any open [heart](#) surgery."

Professor Fausto Pinto, ESC president and course director of the ESC programme in South Africa, said: "The development of innovative therapeutic strategies is extremely important to allow a larger number of [patients](#) to be treated."

Provided by European Society of Cardiology

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