1950s drug is future heart treatment

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Oxford University researchers have found a promising future treatment for heart disease, going back to a drug first developed in 1950.

Hydroxychloroquine (HCQ) was created to combat malaria, and was later found to be useful in the treatment of Lupus and rheumatoid arthritis. Now, a team at Oxford University's Departments of Pharmacology and of Physiology, Anatomy and Genetics has found that the drug can also reduce heart rate. Their report, to be published in journal *Heart Rhythm*, says that the treatment could benefit people with

[heart failure](#).

Dr Rebecca Burton, who led the research, said: "The starting point was a chance observation. A patient being treated for Lupus also had a high [heart](#) rate. When the patient started Hydroxychloroquine for the Lupus, their heart rate reduced. We started to think about how the drug might be acting in the heart and began extensive pre-clinical studies in collaboration with [Oxford University heart specialists] Professor Derek Terrar and Professor David Paterson."

Researchers found that the drug acts on an area of the heart called the sino-atrial node. This group of cells keeps the heart beating by producing a rhythmic electrical signal that is transmitted to the rest of the heart muscle. Within the node HCQ targets a particular protein to restrict an [electrical signal](#) known as the 'funny current' that is especially important in setting the heart rate.

The effects of HCQ on the heart were studied in the late 1950s but initial findings were not followed up. There were also reports of lowered heart rate as a side-effect in patients treated for other conditions. But the potential of HCQ as a heart treatment had not been pursued fully until the Oxford team began their research.

Dr Burton said: "There is a big drive to find new purposes for existing drugs because it can save years of expensive development and testing. Established drugs have gone through a lot of the regulatory process already. However, the number of drugs on the market and the number of possible conditions are so huge that it takes a fortuitous observation to connect something which might be viewed as an annoying side-effect to something which could have a clinical benefit."

HCQ has a well-established safety profile. Side-effects are limited and well understood, and it is possible to use it for children and pregnant

women under specialist care. The Oxford team's initial research concentrated on understanding the effects of HCQ and the way in which it worked on the heart as well as safety. HCQ has the potential to be used for heart failure, high blood pressure and angina among other conditions.

The team have patented their results and are now working with the University of Oxford's company Isis Innovation to partner with industry in order to complete clinical trials.

Dr Rebecca Capel, the paper's first author, said: "This treatment has the potential to improve the quality of life for patients who are not responding well to standard heart treatments. There are some very exciting possibilities but we need to go through the full process of clinical trials to really understand its full potential."

Professor Jeremy Pearson, Associate Medical Director at the British Heart Foundation, which funds both Dr Capel and Dr Burton and which part funded the study, said: "This study is an elegant example of how a chance clinical observation, carefully followed up, can provide evidence in favour of an unexpected new use for an old drug."

Provided by Oxford University