Catheter ablation linked to reduced risk of dementia in patients with atrial fibrillation

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People with atrial fibrillation have a reduced risk of dementia if they undergo a procedure called catheter ablation to restore the normal rhythm of their heart, according to a new study published today

(Wednesday) in the *European Heart Journal*.

Previous work, published last year in the *EHJ*, by the same group of researchers showed that atrial fibrillation was linked to an increased risk of dementia, even in people who had not suffered a stroke. It is also known that catheter ablation for atrial fibrillation allows the heart to return to its normal rhythm for a longer period after the procedure compared to anti-arrhythmic drugs, and this improves quality of life.

The new findings published today show that catheter ablation reduced the incidence of dementia by nearly a third (27%) in atrial fibrillation patients compared to those who tried to control their condition with medication alone during the follow-up period. The patients were followed for up to twelve years, with at least 50% of them being followed for 52 months.

Atrial fibrillation (an irregular and often abnormally fast heartbeat) is the most common heart rhythm problem among elderly people and more than half of patients with atrial fibrillation are aged 80 or older. It increases the risk of stroke, other medical problems and death. As populations age, the incidence of atrial fibrillation is expected to increase, and there is mounting evidence that it may contribute to the development of thinking problems and dementia. Treatments include medications such as digoxin and beta-blockers, cardioversion (a controlled electric shock to restore the normal rhythm) or catheter ablation. Catheter ablation involves inserting a tube through a blood vessel to the heart to identify where the arrhythmia originates. Radiofrequency energy is then used to inactivate or cordon off the affected area. So far, there has been conflicting evidence as to the effect of ablation on the incidence of dementia.

Researchers led by Boyoung Joung, professor of cardiology and internal medicine at Yonsei University College of Medicine, Seoul, Republic of

Korea, and Gregory Lip, professor of cardiovascular medicine at the University of Liverpool, UK, and an adjunct professor at Yonsei University College of Medicine, analysed data from the National Health Insurance Service (NHIS) of Korea on 834,735 adults newly diagnosed with atrial fibrillation from 1 January 2005 to 31 December 2015. They identified 9,119 patients who had ablation and 17,978 who received medical therapies.

During the follow-up period, there were 164 cases of dementia in the group of people who had ablation, and 308 cases in the medical therapy group. This gave an incidence rate per 1000 person-years (the number of years of follow-up multiplied by the number of people in the study) of 5.6 and 8.1 for the ablation and medical therapy groups respectively.

Prof. Joung said: "The proportion of people who developed dementia during the follow-up period was 6.1% in the ablation group and 9.1% in the medical therapy group. This suggests that three people per 100 of the atrial fibrillation population avoid dementia if they undergo catheter ablation, and 34 patients would need to be treated to prevent one case of dementia during the follow-up period."

When they looked at different types of dementia, they found that ablation was linked to a 23% lower incidence of Alzheimer's disease compared to medical therapies (4.1 versus 5 per 1000 person-years respectively) and a 50% decrease in vascular dementia (1.2 versus 2.2 per 1000 person-years respectively). After removing patients who suffered a stroke during follow-up from the analysis, ablation was still signficantly associated with a reduced risk of overall dementia and of vascular dementia, but a statistically non-significant reduced risk of Alzheimer's disease.

The researchers also looked at 5863 matched patients who underwent ablation to see if there was a positive relationship with the observed low

dementia rate and the ablation procedure itself or the success of ablation.

Prof. Lip said: "If we defined ablation failure as requiring repeat ablations, cardioversion or medical therapies, then we found that the procedure failed in 45.3%: 2661 patients. We found that successful ablation was significantly associated with a 44% reduced risk of dementia compared with medical therapy but if ablation failed, we did not see a significant reduction in risk. This suggests that it is maintaining the regular rhythm of the heart with successful ablation, and not ablation itself, that may contribute to a lower risk of dementia in patients with atrial fibrillation."

The link between ablation and lower risk of dementia was consistent regardless of sex, residential area, use of health care, heart failure, history of stroke, blood thinning medications and scores for predicting stroke (CHA2DS2-VASc score).

First author of the study, Dr. Daehoon Kim, a fellow of cardiology at Yonsei University College of Medicine, said: "Due to the observational nature of the study, our findings show only an association between ablation and dementia. To answer the question whether ablation for atrial fibrillation reduces the incidence of dementia, a randomised controlled trial investigating cognitive outcomes is needed. However, we believe the finding that only successful ablation is associated with lower dementia risk is important because it suggests there might be a dose-response relationship between ablation maintaining a regular heart rhythm and a lower risk. We are going to investigate whether a rhythm control strategy for atrial fibrillation is associated with a lower risk of dementia, compared with a strategy to control the rate of the heartbeat."

The researchers believe their findings from the Korean population can apply to other populations as well. Limitations of the study include the fact that the researchers were unable to determine the reason for

undergoing ablation or medical therapy and this might be a source of bias; although they adjusted for factors that could confound the results, unidentified confounding factors might remain; and milder cases of dementia may have been undetected.

More information: Daehoon Kim et al, Less dementia after catheter ablation for atrial fibrillation: a nationwide cohort study, *European Heart Journal* (2020). DOI: 10.1093/eurheartj/ehaa726

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