

MIND
TO THE
BODY

NG WAN CHING

heart rhythm known as atrial fibrillation, which can cause a

stroke.

This was a finding of the Singapore Longitudinal Ageing Study, an ongoing long-term study started in 2003 on Singapore's rapidly ageing population.

The study found that 2.6 per cent of men and 0.6 per cent of women aged more than 55 years had atrial fibrillation, with the proportion rising with age. More than 2,800 people aged 55 and above were recruited for the study.

To arrive at the prevalence, electrocardiograms (ECGs), which record the electrical activity of the heart, were performed on a cross-section of the population who were more than 55 years old.

The number may still be an underestimation because most patients have atrial fibrillation which occurs only intermittently and it might not have been present at the time the ECG was done for this study, said doctors here.

But the findings here are similar to the figures cited overseas, which usually put the prevalence of this condition at between 1 and 2 per cent of the population.

Before this study, the prevalence of this condition – which overseas studies have shown increases the risk of stroke by two to seven times – in Singapore was not known.

A prolonged episode of atrial fibrillation caused Mr Lee, 89, to have a suspected transient ischaemic attack – a brief stoppage of blood flow to the brain – and to be hospitalised in February.

A recent review by doctors at the National University Heart Centre, Singapore (NUHCS) of the number of admissions to one of its cardiac wards in 2010 found that out of about 7,688 admissions, 240 (about 3 per cent) were for atrial fibrillation.

This is a gross underestimation because many patients with the condition would have been admitted for other medical conditions, but it gives some insight into the problem now, said Dr Lim Toon Wei, a consultant at the cardiac department at the NUHCS.

Atrial fibrillation occurs when multiple electrical impulses in the upper chambers of the heart (atria) fire rapidly at the same time. This causes a chaotic rhythm, which is often felt and described as a fast and irregular heartbeat.

Apart from such palpitations, other symptoms include chest pain or discomfort, shortness of breath, giddiness and fatigue.

Because of the chaotic, rapid impulses, the atria cannot contract or pump blood into the lower chambers of the heart (ventricles) effectively. Subsequently, blood flow within the atria slows down and may cause blood clots to form.

These blood clots could break into pieces and travel to the brain, where they could block blood flow in an artery and cause a stroke.

If the clot ends up in a limb, or another organ, it can also cause damage. However, this is relatively less common.

Unfortunately, a stroke or transient ischaemic attack is how atrial fibrillation is first diagnosed in some patients, as it can be completely asymptomatic.

Atrial fibrillation can also cause heart failure if the heart rate is too fast and uncontrolled – usually above 120 beats per minute – for many years.

The likely reason is that the heart pumping chambers (ventricles) cannot adequately fill with blood

when the heart rate is too fast. Over time, the heart muscle starts to dilate and stretches as a result.

This eventually leads to heart failure, but it is reversible if the atrial fibrillation is treated.

In patients with heart failure due to other heart conditions, the onset of an irregular heart rhythm worsens their heart failure and commonly leads to hospital admission.

CAUSE UNCLEAR

The exact mechanisms that cause atrial fibrillation have yet to be fully understood. Doctors believe atrial fibrillation is caused by abnormal electrical activity in the pulmonary veins (which drain blood from the lungs to the heart) in most patients, said Dr Reginald Liew, a senior consultant cardiologist at The Harley Street Clinic at Mount Elizabeth Novena Hospital.

The risk of developing atrial fibrillation increases if one has other cardiac problems, such as high blood pressure, heart failure, valvular heart disease or previous heart attacks. These can increase the pressure within the heart and cause the atria to become stretched over time.

In the long term, this stretching creates scarring and changes in the electrical properties of the atria, which contribute to atrial fibrillation. Hence, patients who are older are also at increased risk.

Younger patients with otherwise normal hearts may have a hereditary component which leads to abnormal electrical activity in the atria and the pulmonary veins.

LIVING WITH A DEADLY RHYTHM

Elderly people have a higher risk of developing irregular heart rhythm, which can cause stroke. This condition can be easily picked up with an ECG and treated if detected early

AGEING POPULATION AT RISK

Atrial fibrillation is a health issue that is set to grow as the population here ages, as the risk of developing it increases with age.

An ageing population also means more people suffering chronic diseases that will raise the risk of atrial fibrillation and stroke.

The proportion of local residents aged 65 years and above increased from 7.2 per cent in 2000 to 9.3 per cent in 2011. By 2030, it is projected to reach 19 per cent.

Overseas studies show that the 0.1 per cent risk of atrial fibrillation for people below the age of 55 rises to 10 per cent for those above 80 years old, said Dr Ching Chi Keong, a senior consultant at the department of cardiology at the National Heart Centre Singapore.

While there is scant data on the number of people here who get strokes because of atrial fibrillation, a 2005 study found that 4 per cent of the population here aged more than 50 years old had had a stroke.

Similarly, this study found that the risk of stroke



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rises with age: from less than 1 per cent in those aged 50 to 54, to more than 14 per cent in those aged over 85.

The risk of stroke in those with atrial fibrillation also varies according to other risk factors, such as if the patient previously had strokes or transient ischaemic attacks or suffers from diabetes, hypertension, heart failure and other cardiovascular diseases, said Dr Lim.

For instance, a 50-year-old man with no other risk factors has a risk of stroke of less than 1 per cent per year, but an 80-year-old man, who has had a previous stroke and has hypertension, diabetes, coronary artery disease and heart failure, has a risk in excess of 20 per cent per year.

One in 10 cases of strokes is caused by clots travelling to the brain from the heart and the vast majority of these are due to atrial fibrillation.

It is not clear how many patients are debilitated by these strokes, but overseas studies suggest that atrial fibrillation-related strokes result in worse outcomes

Surgery may spare patients a lifetime of medication

A patient who cannot use medicine to regulate his severe irregular heartbeat can now turn to an improved minimally invasive procedure that controls heart rhythm and rate.

The procedure, called catheter ablation, could spare such patients a lifetime of having to take

medication. Doctors estimate that about 20 to 30 per cent of patients with significant symptoms of atrial fibrillation would benefit from it. These patients cannot tolerate or do not want to take medicine, or it does not control their symptoms.

This "keyhole" procedure involves the passing of a thin flexible wire through blood vessels in the leg to reach the heart.

Radiofrequency energy is then delivered through the ablation catheter to make a ring of lesions (scars) on the inner wall of the left atrium of the heart. Within the ring are the exits of the four pulmonary veins that drain blood from the lungs into the left atrium of the heart.

Abnormal electrical signals from the pulmonary veins are believed to trigger atrial fibrillation in most patients. As scar tissue is electrically inert, the ring of scars cordoning off the pulmonary veins will block their abnormal electrical signals from reaching the rest of the heart.

Catheter ablation has evolved markedly over the past 10 years. Dr Reginald Liew, senior consultant cardiologist at The Harley Street Clinic at Mount Elizabeth Novena Hospital, said that in the early days of the technique, cardiologists would burn only one or two of the pulmonary veins in which abnormal electrical signals were detected during the procedure.

But they found there was a risk that the pulmonary veins could narrow later due to scar formation at the ablation sites within the pulmonary veins, causing contraction of the blood vessel at a later date. Cardiologists also realised later that the other pulmonary veins which were not targeted might also give off abnormal signals.

The new strategy has made the procedure safer as there is now less chance of a pulmonary vein narrowing after the procedure. It has also significantly improved the outcome of the procedure with a lower chance of atrial fibrillation recurring.

Also, the use of 3-D cardiac equipment allows doctors to combine the anatomy of the heart with the electrical signals and guide the ablation lesions more accurately. Such equipment also helps doctors avoid delivering too much radiofrequency energy to any particular spot, which can cause complications.

Catheter ablation and a two- to three-night stay at the Mount Elizabeth Novena Hospital cost \$22,000 to \$26,000.

Depending on the complexity and patients' medical conditions, the procedure costs between \$7,500 and \$22,400 for non-subsidised patients at the National University Heart Centre, Singapore (NUHCS). It costs about \$10,000 for non-subsidised patients at the National Heart Centre Singapore.

In patients whose atrial fibrillation is intermittent, the procedure has an 80 to 90 per cent success rate, compared with the 40 to 50 per cent success rate of medication to regulate heart rhythm, said Dr Liew.

But the atrial fibrillation recurs in 10 to 20 per cent of patients with intermittent atrial fibrillation and 30 to 40 per cent of

HOW MEDICATION WORKS

For the majority of patients with atrial fibrillation, however, medication is usually enough. They are given anti-arrhythmic medication to help them either maintain a normal heart rhythm or ensure that the heart rate is not too fast if the rhythm remains irregular.

To lower their risk of stroke, they are also given drugs which "thin the blood". These include aspirin and clopidogrel or anti-coagulants such as warfarin.

The use of these types of drugs is balanced against the risk of stroke of individual patients.

Warfarin is more effective than the other drugs, but patients on it have a higher risk of bleeding as their blood becomes too thin. Warfarin reduces the risk of stroke in patients with atrial fibrillation by about 60 to 80 per cent compared with no drug at all.

Aspirin, used for patients with lower stroke risk, reduces the risk of stroke by about 20 to 40 per cent compared with no drug.

Warfarin is more troublesome to use as it requires frequent blood tests and dose adjustments. Thus, it is used only in higher risk patients as the increased efficacy makes it more worthwhile, said Dr Reginald Liew, a senior consultant cardiologist at The Harley Street Clinic at Mount Elizabeth Novena Hospital.

In the last year or so, two new anti-coagulants, which are at least as effective as warfarin in preventing strokes from atrial fibrillation, have entered the market and may well revolutionise how doctors treat these patients, said Dr Lim Toon Wei, a consultant at the cardiac department at the National University Heart Centre, Singapore.

Dabigatran (pradaxa) and rivaroxaban (xarelto) are more user-friendly and, unlike warfarin, do not require frequent blood tests and adjustments of doses.

However, they cost about 20 to 25 times more than warfarin and, hence, are not very widely used yet.

patients with constant atrial fibrillation or with other forms of heart disease such as heart failure.

They will need another procedure to burn away the heart tissue that cause it, said Dr Lim Toon Wei, a consultant at the cardiac department at the NUHCS.

He added: "Sometimes, to achieve adequate rate control, patients may need the implantation of a pacemaker as well."

Study trials are under way to determine if catheter ablation improves not just symptoms, but also long-term clinical outcomes including stroke prevention.

Her heart used to go all 'fluttery', page 14

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ST PHOTO: MUGILAN RAJASEGERAN

Madam Chan Yeen Har, who is under the care of Dr Reginald Liew from The Harley Street Clinic, is on lifelong blood-thinning medication to prevent stroke.

Her heart used to go all ‘fluttery’

Madam Chan Yeen Har looks the picture of health at the age of 74. She is alert, moves around freely on her own and her memory is still pretty good.

But she could have a stroke at any time if she stops taking blood-thinning medication.

Madam Chan, a retired teacher and grandmother of seven, has atrial fibrillation – an irregular heart rhythm. She has also suffered a transient ischaemic attack, a brief stoppage of blood flow to the brain.

Both things put her at a higher risk of stroke.

It began years ago in 2007 when her heart would suddenly go “fluttery” and she would feel her heart beat go faster.

“It was uncomfortable. It felt like I had just run a lot,” said Madam Chan, who has high blood pressure, which is a risk factor for atrial fibrillation.

She thought it might be because she had been drinking too much coffee so she stopped doing so. The symptoms went away.

But in 2009, while on a bus with her daughter on the way to get a haircut, her left hand suddenly felt weak. She repeatedly dropped her keys and her bus ticket. Her daughter thought she did not look good and insisted on sending her to hospital.

She was warded and doctors confirmed she had had a transient ischaemic attack.

The symptoms went away after 24 hours. Fortunately, the attack did not give her any long-term disability.

She now has to be on lifelong medication – blood thinning drugs, such as warfarin, to lower her risk of stroke and drugs to control her heart rhythm.

As she tolerates the medication well, she does not need the catheter ablation procedure.

Her doctor, Dr Reginald Liew, a senior consultant cardiologist from The Harley Street Clinic at Mount Elizabeth Novena Hospital, said the level of warfarin in her body is well-controlled, unlike some patients whose levels fluctuate too much, making it unsafe for them to remain on the drug.

Doctors check the international normalised ratio (INR) to assess the extent of anti-coagulation due to warfarin. The test measures the time it takes for blood to clot and compares it with the average period.

The normal INR of a person who is not on warfarin should be around 1. In patients on warfarin, doctors aim for an INR of between 2 and 3.

Too high a level may cause bleeding; too low and it offers no protection against the formation of blood clots in the heart which may dislodge, travel to the brain and block the blood supply, causing a stroke.

Patients who cannot be on warfarin can opt for two newer drugs. Unlike warfarin, these do not react with food and their levels in the body do not fluctuate as much.

The downside of taking warfarin for Madam Chan is that it restricts her intake of green vegetables, which she loves. They react with the drug, making her INR unstable.

“I can take only one serving at a time. Even if I feel like having more, I cannot,” she said.

But she will continue on warfarin as it is cheaper than the newer drugs. “I’m not insured for this condition and all my drugs are very expensive,” she said.