



THE IMPACT OF RIVAROXABAN AGAINST ASPIRIN ON STROKE RECURRENCE IN INDIVIDUALS HAVING A HISTORY OF LEFT ATRIAL CARDIOMYOPATHY

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Abstract

Aim: Aim of our study is to compare the efficacy of rivaroxaban and aspirin in prevention of reoccurrence of stroke in patients with left atrial cardiomyopathy and unknown stroke.

Background: Stroke develops by the obstruction of blood circulation to the brain; it could be challenging to ascertain the root cause, extent, and cognitive effects of a stroke if its history is unclear. The condition known as left atrial cardiomyopathy (LAC) carries risk of an increased incidence of stroke. Studies in past have studied the effect of Rivaroxaban and aspirin and both are effective methods when used separately. Comparison of the effects has different results.

Methodology: Cross-sectional study

Results: The primary outcome, stroke recurrence, was lower in the Rivaroxaban group compared to the aspirin group (3.4% vs. 18.8%, respectively, $p < 0.01$).

Discussion: Rivaroxaban is more effective than aspirin.

Conclusion: Our study confirmed the findings of most of the previous studies.

Keywords: Rivaroxaban efficacy, stroke, silent stroke, aspirin efficacy, left atrial cardiomyopathy, stroke and left atrial cardiomyopathy

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Introduction:

Stroke develops by the obstruction of blood circulation to the brain, which results in the loss of brain cells. This disruption may be brought on by an obstruction of blood flow (ischemic stroke) or brain bleeding (Hemorrhagic stroke). The ensuing brain injury can cause a wide range of physical and cognitive deficits, such as paralysis, speaking difficulties, and memory issues. Depending on the stroke's severity and the area of the brain where the damage occurred, the functional effects of a stroke can vary greatly. Others may be left with severe disabilities that necessitate continuing care and support, while some people may simply suffer from mild impairments. (1) It could be challenging to ascertain the root cause, extent, and cognitive effects of a stroke if its history is unclear. However, certain stroke symptoms and signs, like numbness or weakness of one half of the body, troubled speech or understanding of language, and abnormalities in vision or balance, may still be present. It is also crucial to keep in mind that some people may experience "silent" strokes, which are strokes that happen without any obvious symptoms. These strokes can nevertheless have serious long-term effects on cognitive function and general health even if they are only discovered by diagnostic tests or imaging examinations. (2)

A variety of cardiovascular disorders, including atrial fibrillation, heart failure, and stroke, can be caused by structural and functional abnormalities in the left atrium of the heart, which is referred to as left atrial cardiomyopathy. The phrase is frequently used to refer to the remodeling and dysfunction of the left atrium brought on by a number of underlying conditions, like diabetes, valvular heart disease, and hypertension. Depending on the underlying disease and the degree of the left atrial remodeling, the functional impact of left atrial cardiomyopathy can be extremely variable. An increased risk of cardiovascular events like stroke and heart failure has been associated with left atrial dysfunction. (3)

The condition known as left atrial cardiomyopathy (LAC) carries risk of an increased incidence of stroke. An abnormality of the left atrium of the heart known as LAC is a disorder that can result in a number of cardiovascular problems, including atrial fibrillation, heart failure, and stroke. The left atrium is a significant component of the heart that is essential for maintaining blood flow and controlling cardiac rhythm. A malfunctioning or enlarged left atrial can result in blood stasis and the production of blood clots, which can subsequently move to the brain and result in a stroke. Irrespective of other hazards such as hypertension, diabetes, and

atrial fibrillation, studies have demonstrated that LAC is a substantial risk factor for stroke. Additionally, it has been demonstrated that the severity of LAC and the risk of stroke are correlated, with a larger risk of stroke being linked to greater left atrial dysfunction and remodeling. It is important to take LAC into account when assessing patients' risk of stroke, and it is also important to employ the proper management and treatment techniques to lower this risk. (4)

Background: Effectiveness of rivaroxaban in preventing stroke recurrence in cases of left atrial cardiomyopathy. The effectiveness of rivaroxaban in preventing thromboembolic events has been studied in many clinical trials. The ROCKET AF trial was a sizable randomized controlled study that contrasted the effectiveness of warfarin with rivaroxaban in preventing systemic embolism and stroke in patients of atrial fibrillation. According to the trial, rivaroxaban had a decreased risk of significant bleeding and was giving results like warfarin in terms of avoiding systemic embolism and stroke. (5) In a study, the EINSTEIN-PE trial, rivaroxaban was contrasted with conventional anticoagulation medication in the management of pulmonary embolism. In terms of preventing recurrent venous thromboembolism (VTE) and having a decreased risk of significant bleeding, the trial found that rivaroxaban was non-inferior to routine anticoagulation therapy. (6)

The effectiveness of aspirin stops strokes from happening again. For many years, aspirin has been utilized as an antiplatelet drug to stop thromboembolic events. Several sizable clinical trials have proven the effectiveness of aspirin in preventing reoccurrence of cardiovascular events. Aspirin, for instance, was found to lower the incidence of significant cardiovascular events in people with diabetes by the ASCEND trial. (7) In the main reduction of heart attacks for individuals at moderate to high risk, the ARRIVE study compared aspirin to a placebo. In comparison to a placebo, the trial indicated that aspirin did not lower the risk of cardiovascular events. (8)

Several trials have examined the effectiveness of aspirin and rivaroxaban in preventing thromboembolic events. In the COMPASS study, a sizable randomized controlled trial, patients with stable atherosclerotic vascular disease were compared between rivaroxaban + aspirin and aspirin alone. According to the trial, using aspirin and rivaroxaban together significantly lowered the risk of serious adverse cardiovascular events like myocardial infarction and stroke. (9)

Methodology:

A tertiary care hospital undertook a cross-sectional survey. Clinical information, including diabetes and hypertension, was extracted from the medical records. A preexisting diagnosis of hypertension, using medication to treat it, having a high systolic blood pressure at discharge (>140 mm Hg) or a high diastolic blood pressure (>90 mm Hg) were all considered to be hypertensive conditions. A diagnosis of diabetes was considered to exist if the HbA1C level at admission was more than 6.5%, if the patient had the condition beforehand, or if they were taking diabetes medication. The presence of a left atrial cardiomyopathy and an acute or sub-acute cryptogenic stroke was also confirmed by reviewing each patient's non-contrast head CT or brain MRI. When choosing participants for the study, there were clear inclusion and exclusion criteria. Patients needed to have a previous incident of cryptogenic stroke in order to be included in the study, as well as a cardiac ejection fraction of greater than 30%, no atrial fibrillation, no significant cervical or intracerebral artery stenosis, no prosthetic cardiac valves, no moderate to severe stenosis of cardiac valves, and prior cardiac rhythm monitoring for at least 24 hours.

Patients also have to satisfy at least two of the following prerequisites for atrial cardiomyopathy: LAVI more than or equal to 35 mL/m², CHADS₂-VASc, and periods of elevated atrial rates known as frequent premature atrial contractions (10) score greater than or equal to 4, and spontaneous

echocontrast in the left atrium in transesophageal echocardiography. Patients with atrial fibrillation, stenosis greater than 50% in the cervical and intracerebral arteries, or functioning patent foramen ovale were disqualified from the study. The study comprised patients who matched the inclusion requirements and at least two of the atrial cardiomyopathy criteria. Depending on the patient's needs, some patients' neurologists prescribed rivaroxaban or aspirin for secondary prophylaxis. Following a two-year period of stroke recurrence monitoring, the patients were split into two groups depending on their treatment regimens. Transthoracic echocardiograms from all patients taken at the time of admission were examined, and LAVI more than or equal to 35 mL/m² was taken from the reports. Total 850 patients were selected who were taking Rivaroxaban and 612 patients who were taking Aspirin making a total sample of 1462.

Results

A total of 1462 patients were included in the study, with 850 and 612 in Rivaroxaban and aspirin group respectively. The mean age of the study population was 68.8 ± 9.1 & 63.7 ± 8.2 years in Rivaroxaban and aspirin group respectively, and 57% were male. The two groups were comparable in terms of baseline characteristics, including age, sex, comorbidities, stroke risk factors, and medication use.

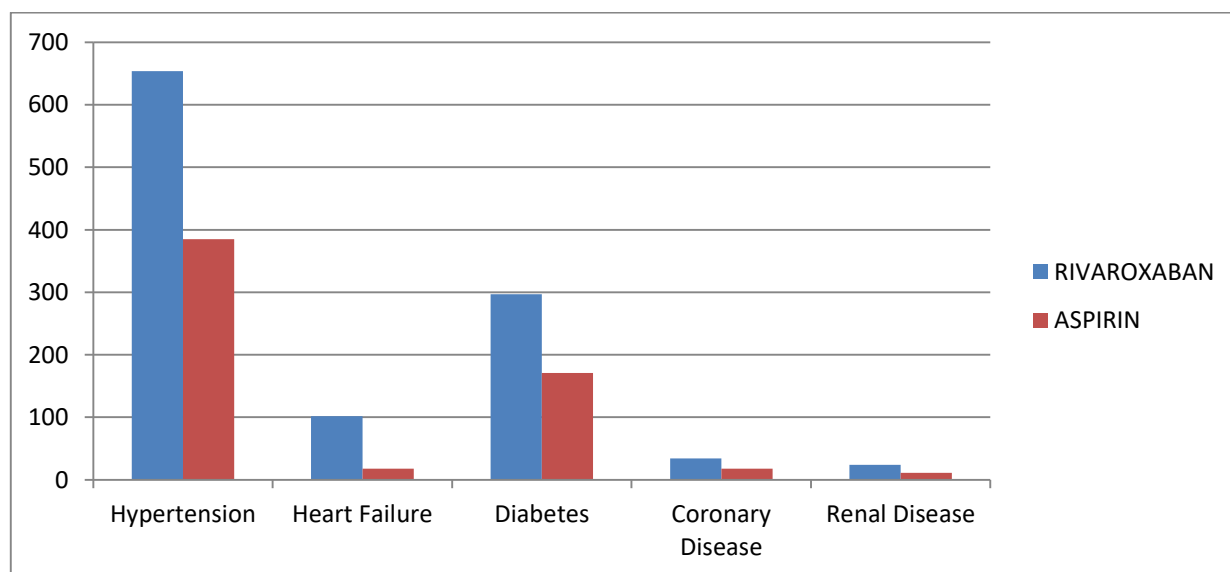


Figure 1 : Clinical Characteristics

Table 1: All Baseline Characteristics

Variables	RIVAROXABAN (850)	ASPIRIN (612)
Age mean \pm SD	68.8 \pm 9.1	63.7 \pm 8.2
Male (n)	467	372
Female (n)	383	240
Hypertension (n)	654	385
Heart failure (n)	102	18
Diabetes (n)	297	171
Coronary disease (n)	34	18
Peripheral artery disease (n)	17	0
Pacemaker/ICD (n)	8	0
Renal disease (n)	24	11
Height mean \pm SD	167.5 \pm 9.8	168.1 \pm 9.5
Weight mean \pm SD	73.8 \pm 10.2	76.2 \pm 13
BMI mean \pm SD	26.3 \pm 8	27 \pm 5.5
CHA ₂ DS ₂ -VASc score, median (IQR)	4.6	4.5
Left Atrial Volume Index (LAVI) mean \pm SD	40.31 \pm 2.8	39.70 \pm 2.7

The primary outcome, stroke recurrence, was lower in the Rivaroxaban group compared to the aspirin group (3.4% vs. 18.8%, respectively, p= <0.01).

Table 2: Primary Outcome

Reoccurrence of Stroke (n)	RIVAROXABAN (850)	ASPIRIN (612)
(n)	25	115
%age	3.4	18.8

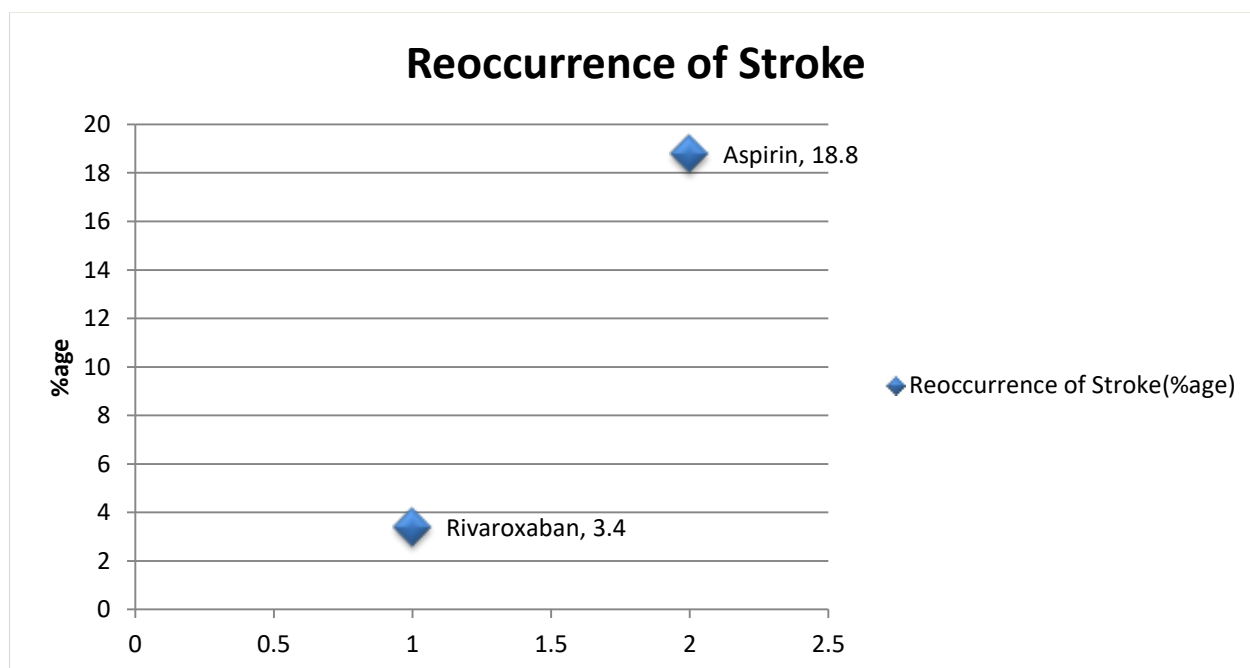


Figure 2: Reoccurrence of Stroke

If we take the 1462 patients in the study as the population at a specific time, then morbidity associated with both drugs can be calculated. The morbidity rate associated with rivaroxaban was 1.7% and that with aspirin was 7.9%.

Discussion

There is limited research available specifically comparing the efficacy of rivaroxaban against aspirin for preventing recurrent stroke in individuals having left atrial cardiomyopathy. Aspirin and rivaroxaban are two popular antithrombotic drugs. Aspirin is an antiplatelet

drug that permanently inhibits cyclooxygenase (COX)-1, whereas rivaroxaban is a direct oral anticoagulant (DOAC) that inhibits factor Xa. In individuals with a range of illnesses, both medications are used to avoid thromboembolic events including stroke and myocardial infarction. There are numerous studies that support the use of aspirin and rivaroxaban in the treatment of stroke. A comprehensive review and meta-analysis of 13 randomized controlled studies that examined the effectiveness of rivaroxaban and other anticoagulants in preventing VTE concluded that rivaroxaban was superior to placebo in this regard and non-inferior or superior to other anticoagulants. (11) Aspirin is effective at lowering the risk of non-fatal stroke and myocardial infarction, but it has no effect on mortality from all causes, according to a meta-analysis of 16 randomized controlled studies that compared it to placebo or other antiplatelet medications in the prevention of cardiovascular events. (12) On the basis of several randomized clinical trials, the American Heart Association and American Stroke Association's current guidelines for stroke prevention recommend anticoagulants (like rivaroxaban) over antiplatelet medications (like aspirin) for patients with atrial fibrillation and a high risk of stroke. These studies have shown that anticoagulants work better than antiplatelet medications to lower the risk of recurrent stroke in this patient population. It is crucial to remember that each patient's situation should be considered when deciding whether to use anticoagulants or antiplatelet medications to prevent strokes in those with left atrial cardiomyopathy. This includes the patient's general health, their risk of bleeding, and any other underlying medical conditions. A healthcare provider should be consulted to determine the best course of treatment for each patient. (13)

One study, called the NAVIGATE ESUS trial, found that rivaroxaban was better in efficacy against recurrent stroke than aspirin in patients with embolic strokes of unknown source. According to the study, patients who received rivaroxaban treatment had a considerably decreased risk of having another stroke than those who received aspirin treatment. (14) The RE-SPECT ESUS trial was another study that examined rivaroxaban and aspirin for avoiding recurrent stroke in ESUS patients. In addition, this study discovered that rivaroxaban was superior to aspirin at lowering the risk of subsequent strokes. (15) The ROCKET-AF trial, a study, examined the anticoagulants rivaroxaban and warfarin in AF patients, including those with left atrial cardiomyopathy. The trial

discovered that rivaroxaban had a reduced risk of severe bleeding than warfarin and was non-inferior in preventing stroke and systemic embolism. (5) In another investigation known as the AVERROES trial, individuals with AF who weren't suited for warfarin treatment were given either aspirin or apixaban, a drug that is similar to rivaroxaban. According to the study, apixaban had a similar risk of significant bleeding and was just as effective as aspirin at preventing stroke and systemic embolism. (16) In a different investigation, the ACTIVE-A trial, patients with AF were divided into two groups: those receiving aspirin and clopidogrel (an antiplatelet drug), and those receiving aspirin alone. According to this study, aspirin and clopidogrel together reduced the risk of stroke more effectively than aspirin alone, but at the expense of a higher risk of serious bleeding. (17)

Generally, anticoagulant drugs like rivaroxaban are thought to prevent strokes in people with AF, especially those with left atrial cardiomyopathy, better than antiplatelet drugs like aspirin. However, a patient's unique circumstances and a conversation with their healthcare professional should be taken into consideration when choosing which medicine to utilize for stroke prevention. The choice of the drug to use for stroke prevention should be based on individual patient circumstances and a discussion with their healthcare professional because both rivaroxaban and aspirin have potential side effects and dangers.

These trials suggest that rivaroxaban may prevent recurrent stroke more effectively than aspirin in people with left atrial cardiomyopathy brought on by AF. However, the choice of medication should be made after talking with a healthcare expert and considering circumstances specific to each patient. According to the study's findings, people with a history of LACM and unknown stroke may find rivaroxaban to be more beneficial than aspirin in lowering their chance of having another stroke. These results are in line with earlier research that contrasted the effectiveness of the two drugs in various demographics. The study is constrained by the retrospective methodology, the small sample size, and the absence of randomization, among other factors. To validate these results and identify the ideal drug for stroke prevention in people with LACM, more research, including randomized controlled trials, is required.

Conclusion

As a result, this cross-sectional study raises the possibility that rivaroxaban may be superior to aspirin at lowering the risk of stroke recurrence in

people with a history of LACM and an unidentified stroke. However, more research is required to verify these results and identify the best drug for this population's risk of stroke. When choosing stroke prevention drugs for patients with LACM, clinicians should take into account the risk factors and comorbidities specific to each patient.

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