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Review Article

The Burden of Atrial Fibrillation as Stroke Risk Factor in Southeast Asia: A Systematic Review

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ABSTRACT

Introduction Stroke is the most burden complication in a patient with atrial fibrillation. Atrial Fibrillation (AF) is the common cardiac arrhythmia in stroke patients. The epidemiology study of AF-associated stroke were limited published research in southeast. This study may prove valuable in routine clinical practice. This systematic review aimed to identify the latest evidence on the epidemiology of AF related stroke in southeast Asia regions.

Methods: We performed a comprehensive search on prevalence or incidence of atrial fibrillation related stroke from inception up until September 2019 through PubMed and Cochrane Central Database. The keywords were the combination of the following words: "stroke", "epidemiology", "atrial fibrillation", and was then used with the name of each country in southeast Asia". The inclusion criteria of the study i.e : patients with stroke, was a original papers with observational study, concerned on AF in stroke patients in southeast Asia. Data on incidence and prevalence were obtained from hospital-based studies and community-based studies.

Results: Atrial Fibrillation prevalence data are available in five countries in southeast Asia, a total of the 11 articles identified were from Malaysia, Thailand, Vietnam, Singapore, and Indonesia were also represented. The reported prevalence of AF as a risk factor of stroke patients was 2.6 % until 23.04% based on hospital-based studies.

Conclusion: AF is one of risk factors that associated with the stroke. This study also showed that prevalence AF in South East Asia ranged 2.6 – 23.04 % . However, owing to the limited number of studies in southeast Asian countries, further investigation is needed before drawing a definite true of prevalence of AF in the southeast Asia population.

Keywords: Atrial Fibrillation, AF-associated Stroke, Epidemiology, Risk Factors.

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1. INTRODUCTION

Atrial Fibrillation (AF) is the most powerful cardiac arrhythmia associated with stroke.¹ Stroke is the most burden complication in a patient with atrial fibrillation. Cardioembolic stroke is a stroke that be caused by AF.² The mortality of Cardioembolic stroke reaches 20% and Disability approximately 60%.³ Cardioembolic stroke is most common in the elderly, especially the oldest-old AF patients. Atrial fibrillation (AF) increases 4–5-fold the risk factor for stroke than that in patients without AF.⁴

The prevalence of AF is growing worldwide with advances in technology, higher prediction methods and increased awareness among healthcare professionals and patients. It is estimated that in the year 2050 Asian population with AF will get through 72 million and of whom 2.9 million AF may

associate with stroke.^{5, 6} Thus, prevalence and incidence of AF is important to know as a troubled healthcare and public-health concern in Asia.

The epidemiology study of AF-associated stroke has been widely investigated worldwide however there were few published research about prevalence AF in stroke patients, especially from southeast Asia countries. These gaps in the study of prevalence stroke patients with AF probable lead to sub-optimal treatments of patients with AF in stroke patients. Due to a lack of systematic data in many countries in the southeast Asia region, we review the incidence and prevalence of AF related-stroke patients from southeast Asia. The aim of this study was to report a systematic review of the published literature on the epidemiology of AF related stroke in southeast Asia regions.

2. METHODS

We performed a comprehensive search on prevalence or incidence of atrial fibrillation in stroke from inception up until September 2019 through PubMed and Cochrane Central Database. The keywords used were: "stroke", "epidemiology", "atrial fibrillation" was then used with the name of each country in southeast Asia. The records were then systematically evaluated using inclusion and exclusion criteria. The inclusion criteria of the study i.e.: patients with stroke, was a original papers with observational study, concerned on AF in stroke patients in southeast Asia. Data on incidence and prevalence were obtained from hospital-based

studies and community-based studies with wide age ranges and no upper limit. All the data search was conducted by a single author (RP). We include all related clinical researches/original articles including conference proceedings, and exclude case reports, review articles, and non-English language articles. The data were then tabulated, stratified according to geographical regions. Preferred Reporting Items for Systematic Reviews flowchart of the literature search strategy of studies investigating the ablation index was presented in Fig. 1. This report presents a descriptive analysis of the data and no meta-analysis was planned.

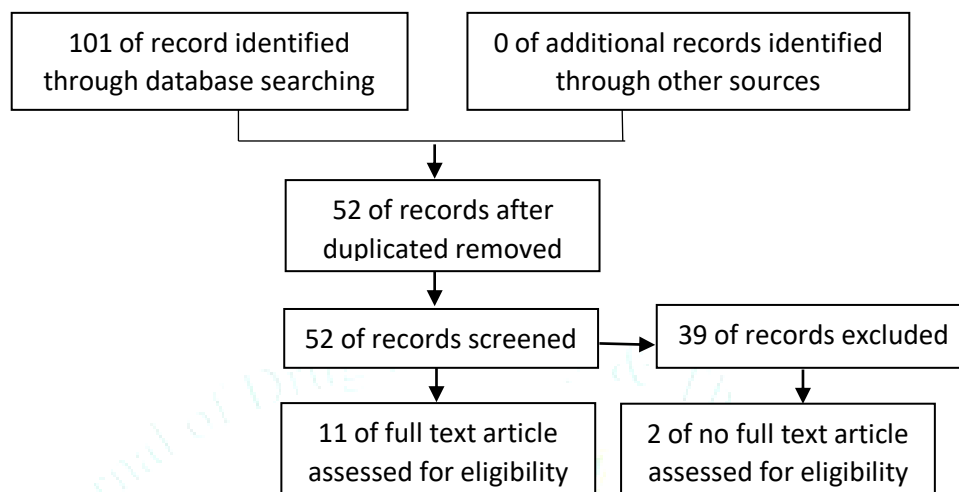


Figure 1. Flow diagram

3. RESULTS AND DISCUSSION:

Table 1 Characteristics of the observational studies on stroke

Research site	First author (Publication year)	Sex	Age	Type of stroke	Sample	Sample who had a Atrial Fibrillation
Hospital-based studies						
Indonesia	Misbach J (2001)	Male>female	58.8± 13.3 (18–95)	ischemic & hemorrhagic	2065	5.8% ⁷
Indonesia	Pinzon R(2019)	Male > Female	>60 (82,22%)	Ischemic	1688	2.62% ⁸
Malaysia	Aziz ZA(2016)	Male>female (55.1vs44.9)	67.9 ±13.3	ischemic	4762	6.5% ⁹
Malaysia	Chee KH (2014)	Male >female	71.0 ± 2.2 (43 - 86)	Ischemic	207	10.6% ¹⁰
Malaysia	Hwong WY(2017)	Male > female (55 vs45)	.>60(57%)	Ischemic	5292	7% ¹¹
Malaysia	Aziz ZA (2015)	Male >female	62.7 ± 12.5	ischemic & hemorrhagic	7830	2.6% ¹²
Thailand	Phrommintikul A (2016)	Male &female	73.2 ± 6	ischemic & hemorrhagic	14	16.7% ¹³
Thailand	Vorasoot N (2019)	Male >female	>18 years	Ischemic	768	23.04% ¹⁴
Vietnam	Yamanashi Hirotomoto A (2012)	Male>female (61.1vs38.9)	65.0 ±14.8	ischemic & hemorrhagic	754	5.8% ¹⁵
Singapore	Sharma VK (2012)	Male & Female	64.1 ± 11.9	ischemic & hemorrhagic	481	10% ¹⁶ sin
Community-based studies						
Thailand	Kannikar Kongbunkiat (2015)	Male & Female	>18 years	Ischemic	277.291	9.1% ¹⁷

Atrial Fibrillation prevalence data are available in five countries in southeast Asia, a total of the 11 articles identified were from Malaysia, Thailand, Vietnam, Singapore, and Indonesia were also represented. The reported prevalence of AF as a risk factor of stroke patients was 2.6 % until 23.04% based on hospital-based studies. The rate of stroke-related to AF was similar a systematic review from eight countries in Asia, which was 0.36% to 28.3% in hospital-based studies¹⁸. A systematic review of the epidemiology of atrial fibrillation in regions outside North America and Europe reported that nearly similar prevalence of AF in stroke showed 2.8% to 14%.¹⁹

In Review Hospital-Based studies, Thailand becomes a highest of the prevalence of AF in stroke patients and the lowest prevalence is seen in Indonesia and Malaysia. In Thailand, study Vorasoot N (2019) in similarly with the previous epidemiology study that Approximately 20% of all ischaemic stroke had AF, however, the inclusion criteria included adult patients diagnosed with acute ischemic stroke who received rt-PA treatment. In this review, the subject predominantly male and mean of age more than 60 years old. A similarly previous study that prevalence of AF is higher in men and older age¹. The mean age was around 70 years¹⁹. AF patients with AF were aged 60 years or older in most studies ranged 57%–98% Men were more common to develop AF than women with 4.4%–7.9%²⁰

The community-based studies data were screened to find out the burden of AF in southeast Asia. The Number of community-based studies of only one country is available in Thailand. In this review, Kannikar reported that 9% of 277291 stroke patients related to AF based on community studies. Guo Y et al in their systematic review include studies in China, Japan, and Singapore, reported that the rate of stroke-related to AF was 13.0%–15.4%. A Systematic Review in Asia revealed different the rate of stroke-related to AF, which was 1.9% to 6.0%¹⁸ In contract, a systematic review of in regions outside North America and Europe reported that prevalence of AF in stroke with different ranges in community-based studies ranged 0.1%to 4%.¹⁹

The variation differences results of prevalence of AF in countries were caused variable and the studies were performed at different time points, differences in the risk-factor prevalence, screening/detection method and level of control. Thus are not strictly comparable of studies. Mostly in review, AF was diagnosed if there was a previous history of AF or if it was discovered on electrocardiography (ECG) during admission.

Asian cohorts from the recent randomized trials of the NOACs have reported the prevalence of AF-related stroke in a RE-LY trial, ROCKET-AF trial and ARISTOTLE trial revealed a higher absolute annual rate of ischemic stroke in Asians compared with non-Asians.²¹²²²³ This Result of RCT showed that the burden of AF had a great impact on risk in the Asian population and The higher prevalence AF related stroke become a sign of under treatment of management of AF for prevention stroke become a problem seriously in Asian populations. these data add support to the view that the prevalence of AF in Asian populations is higher than that in Western populations.

Prevalence of AF might be underestimated in developing countries and developed countries although the clinical burden of AF had a higher risk of stroke events and recurrent. Furthermore, in response to the increasing prevalence of AF especially in Asian, additional resources will need to be allocated globally for prevention and treatment of AF and its associated complications²⁵ Hence, the development of tools and strategies to detect AF early should

be made a priority among clinicians and healthcare policymakers.

AF is often asymptomatic and undetected in older people, so if screening for unknown AF has carried out at scale, and people found were treated with an oral anticoagulant, many strokes could be prevented. Meta-analysis and systematic review for screening studies for AF by lowres et al have shown that unknown AF increased dramatically with age and is more common in males.²⁶ Over the age of 55, the detection rate is 1.4% on a single timepoint screen with either pulse taking or ECG, but for the age group between 80 to 84, it is 1.9%. The combination of screening detection rate and risk of stroke over the age of 65 has led a number of continental and country-specific guidelines to recommend screening in patients over that age, but this is not practiced worldwide.

In this hospital-based study in southeast Asia, the study collected information only a single ECG recording and did not use intermittent ECG or Holter monitoring for screening the paroxysmal /silent AF. As a result, AF may be underestimated and missed diagnosed in southeast Asia countries that had an impact on the outcome in a developing country. Some previous studied demonstrated that AF contributed to worse outcomes in stroke patients compared to stroke patients without AF.^{1,10} It was necessary to recognize AF in stroke patients for improving outcomes in Developing Countries. Hospital-based study about AF related stroke had a small sample size. Few Sample may contribute to the limited power to detect the true prevalence in a population. However, owing to the limited number of studies in southeast Asian countries, further investigation is needed before drawing a definite true of prevalence of AF in southeast Asia.

The methods of single timepoint screening vary from physical examination using pulse palpation or auscultation of the heart or knockoff sounds while measuring blood pressure, to a handheld ECG single lead rhythm strip and conventional ECG.⁵ Single time point screening will largely detect persistent or very high burden paroxysmal AF, and will, therefore, miss a lot of paroxysmal AF. ²⁶ Causing underestimation of unknown AF to overcome this issue, a number of more intense screening protocols have been adopted. Prolongation of continuous Holter monitoring in patients with a cerebral ischemic event increases the rate of detection of paroxysmal atrial fibrillation and results in a change in therapy in a substantial number of patients. ²⁶

There are now many devices available to both physicians and the general population which can screen for AF from photoplethysmographic (PPG) devices in smartphones, smart watches and fitness trackers and rings.^{1,5} They can also be used semi-continuously and may, therefore, detect AF with low risk, as with implanted devices, so we will need to much greater attention to the health impact of what is now being promoted to consumers. In Community, teaching a high risk population to learn pulse palpation for self-detection of AF has been shown to be effective,²⁷

4. CONCLUSIONS:

Prevalence of AF in Stroke patients among southeast Asia was ranged from 2.6 % to 23.04%. AF is the most powerful risk factor associated with a stroke in which AF prevalence in Southeast and Better detection of AF diagnostic in stroke patients is important for preventing recurrent stroke. However, owing to the limited number of studies in southeast Asian countries, further investigation is needed before drawing a definite true of prevalence of AF in the southeast Asia population.

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