



Predicting Atrial Fibrillation in Ischaemic Stroke

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Background & Objectives



Atrial fibrillation and ESUS

- There has been renewed interest in the relationship between AF and stroke
- This has resulted in the concept of embolic stroke of undetermined source (ESUS).
- AF is detected in approximately 30% of ESUS patients (1)
- Oral anti-coagulants significantly reduce the risk of ischaemic stroke in patients with documented AF (2)
- Standard ECG and 24-hour telemetry are specific but lack sensitivity in detecting AF (3)
- Holter monitors or implantable loop recorders are more sensitive but come at increased cost and invasiveness (4)
- Should we continue focusing on detection or expand our diagnostic repertoire to include accurate prediction of AF? Do clinical predictors of AF exist?

Aims:

1. We conducted a systematic review of the literature to identify clinical predictors of AF

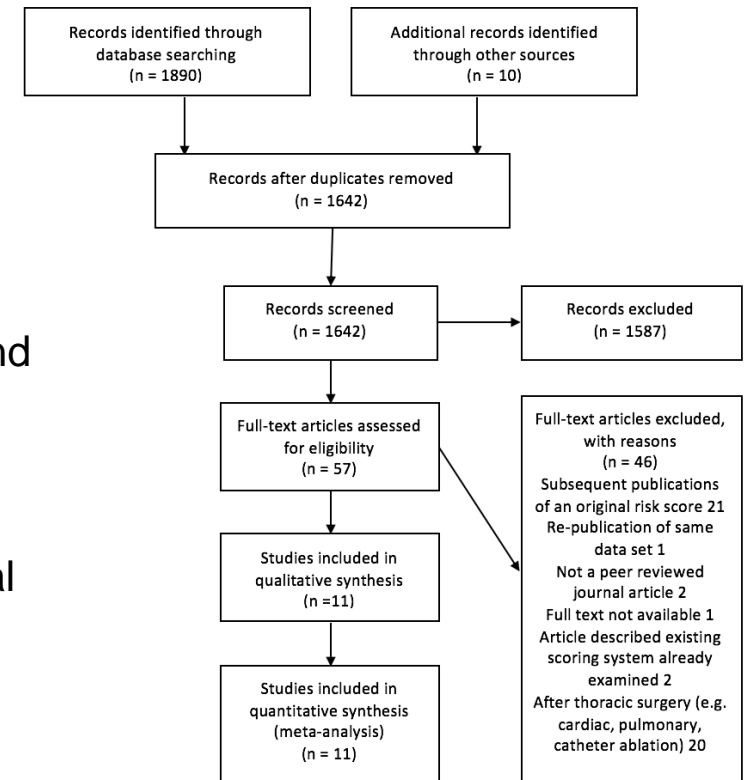


Study Design & Analysis



Study design:

- Systematic review of the literature to identify predictors of AF
- A number of databases were interrogated
- Inclusion criteria
 - Peer-reviewed articles published between January 1988 and 2018 in English
- Exclusion criteria
 - Post-cardiac ablation for atrial fibrillation or thoracic surgical patient populations
- Titles and abstracts were screened by three parties
- The quality of the studies was assessed using the National Institutes of Health quality
- assessment tool for observational studies



Results

Risk prediction tools:



Author, year, country	Score	N ³	Period of data collection	Population	Age (years) mean ±SD	% male	Study design (P/R/C) ⁴	Study Quality	Detection of AF	Prevalence of AF	Incidence of AF ⁵	C statistic (mean, 95% CI)
Schnabel, 2009, USA	Framingham	4,764	1968 – 1984	Outpatients with no prior AF	60.9±9.9	45	P/R	10 Good	ECG, Holter, records	NR	6.3 (men) 3.3 (women)	0.78 (0.74-0.79) 0.79 (0.77-0.82) with echo findings
Suissa, 2009, France	STAF ⁶	456	2007 – 2008	ESUS inpatients	65.25±14.7	59.4	R	7 Fair	ECG, 24-hour Holter	50.8%	NR	0.94
Chamberlain, 2011, USA	ARIC ⁷	14,546	1987 – 1989	Outpatients	45-64	NR ⁸	P	9 Fair	ECG, Records Death certificates	3.5%	NR	0.78
Alonso, 2013, USA	CHARGE-AF ⁹	18,556	1971 – 2006	Outpatients	60-76	54.6-65	P/R	7 Fair	ECG, records	3-12%	NR	0.765 (0.748 - 0.781) Augmented score: 0.767 (0.750 - 0.783).
Everett, 2013, USA	WHIS ¹⁰ AF risk algorithm	20,822	NR	Outpatients (women) with no CVD	52.9±4	0	P	10 Good	History, records	NR	2.23	0.718 (0.684 - 0.753) 0.741 (0.709 - 0.774, p<0.001) for SNP algorithm addition
Fuji, 2013, Japan	Unnamed	354	2006 – 2008	Inpatients with acute ischaemic stroke in last 24 hours	70.2	64.2	R	8 Fair	History, records	NR	NR	0.89 (0.83 - 0.95)
Brunner, 2014, USA	Unnamed	100,000	2002 – 2007	Outpatients	42.9±18.5	40.5	P	7 Fair	ECG	NR	NR	0.812 (0.805-0.820)
De Figueiredo, 2014, Brazil	ASAS ¹¹	257	2009 – 2010	Inpatients with ischemic stroke or TIA	80.4±14.3	51.1	P	8 Fair	ECG, Holter, telemetry	NR	NR	0.78 (0.70-0.86)
Yoshioka, 2015, Japan	iPAB	449	2013 – 2014	Inpatients with acute ischemic stroke	42.9±18.5	NR	P	8 Fair	Continuous ECG monitoring	17%	NR	0.90
Muscari, 2017, Italy	MrWALLETS	571	2007 – 2015	Inpatients with ischemic stroke	72.7±13.5	49.4	R	7 Fair	Continuous ECG monitoring	9.8%	NR	0.89 (0.83 – 0.95)
Ricci, 2018, USA	ESUS-AF	296	2013 – 2016	Inpatients with ischemic stroke	63.9±14.8	57.2	R	10 Good	Outpatient cardiac monitoring for 30 days	12.8%	NR	0.725

Key Findings:

- Our review of the available literature has identified 11 tools that reliably predict the development of atrial fibrillation, with a C statistic ranging from 0.713 to 0.90
- Commonly included variables were age, hypertension and left heart strain based on ECG and/or echocardiography.
- None of these tools are used in clinical practice

		Authors										
		Alonso	Brunner	Chamberlain ⁷	Everett	De Figueiredo	Fuji	Muscari	Ricci	Schnabel	Suissa	Yoshida
Epidemiology	Age	•	•	•	•	•	•	•	•	•	•	•
	Sex	•	•			NS ¹³	NS	•	NS	•		•
	Race			•								
Obesity	Height			•	•					NS		
	Weight	•			•							
	BMI	•	•				NS			•	NS	
Vascular risk factors	Hypertension	•	•	•	•	NS		NS	NS	•	•	NS
	Diabetes	NS	•	•		NS	•	•	NS	NS	NS	NS
	Dyslipidaemia	•	•	•		NS	NS	NS	NS	NS	NS	NS
	Smoking	NS		•	NS	NS	NS	•		NS	•	
	Alcohol				•					NS	NS	
	Coronary artery disease/AMI	•	•	•		NS		•	NS	•	NS	NS
	Carotid stenosis											
	CHADS					•						
	HR/Arrhythmia/ anticoagulation use			•		•			•	•		•
	Heart failure/EF	•	•	•		NS					•	NS
Cardiac abnormalities	PR interval	•	•	•					NS	•		
	Cardiac murmur			•						•		
	Left valvulopathy		•			•	•				•	•
	Left atrial dilatation			•		•			•		•	•
	Left ventricular hypertrophy			•								•
	Cardiac structural abnormalities					NS						
	Intramural thrombi					NS						
Neurological	Spontaneous left atrial contrast					•						
	NHSS					•	•	•	•		•	
	Brain lesion characteristics					•	•	•			•	
	History of stroke/TIA mRS at discharge		•			NS/•	NS		NS			NS
Biomarkers	BNP	•				•						•
	A-ANP											
	CRP	NS						NS				
Other	D-Dimer					•						NS
	Renal failure		•									NS



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Work presented at European Stroke Organisation 2018 with honourable mention

<https://eso-stroke.org/eso/esoc-2018-poster-walk-with-dr-reale-the-reprise/>

Thank You!



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