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Opportunistic atrial fibrillation screening in primary care in Ireland: results of a pilot screening programme

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ABSTRACT

Background Atrial fibrillation (AF), a common, frequently asymptomatic cardiac arrhythmia, is a major risk factor for stroke. Identification of AF enables effective preventive treatment to be offered, potentially reducing stroke risk by up to two-thirds. There is international consensus that opportunistic AF screening is valuable though uncertainty remains about the optimum screening location and method. Primary care has been identified as a potential location for AF screening using one-lead ECG devices.

Methods A pilot AF screening programme is in primary care in the south of Ireland. General practitioners (GPs) were recruited from Cork and Kerry. GPs invited patients ≥65 years to undergo AF screening. The screening comprised a one-lead ECG device, Kardia Mobile, blood pressure check and ascertainment of smoking status. Possible AF on one-lead ECG was confirmed with a 12-lead ECG. GPs also recorded information including medical history, current medication and onward referral. The Keele Decision Support tool was used to assess patients for oral anticoagulation (OAC).

Results 3555 eligible patients, attending 52 GPs across 34 GP practices, agreed to undergo screening. 1720 (48%) were female, 1780 (50%) were hypertensive and 285 (8%) were current smokers. On the one-lead ECG, 3282 (92%) were in normal sinus rhythm, 101 (3%) had possible AF and among 124 (4%) the one-lead ECG was unreadable or unclassified. Of the 101 patients with possible AF, 45 (45%) had AF confirmed with 12-lead ECG, an incidence rate of AF of 1.3%. Among the 45 confirmed AF cases, 27 (60%) were commenced on OAC therapy by their GP.

Conclusion These findings suggest that AF screening in primary care may prove useful for early detection of AF cases that can be assessed for treatment. One-lead ECG devices may be useful in the detection of paroxysmal AF in this population and setting. Current OAC of AF may be suboptimal.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Atrial fibrillation (AF) is the most commonly diagnosed cardiac arrhythmia and a major independent risk factor for stroke. Early identification of AF enables oral anticoagulation, which can significantly reduce stroke risk. AF screening may enhance the detection of asymptomatic or subclinical AF in general practice.

WHAT THIS STUDY ADDS

⇒ This study provides real-world evidence of the feasibility opportunistic AF screening in an Irish primary care setting.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Evidence from this study can inform future AF screening studies and can inform policy-makers regarding the use of one lead ECG technology in screening and detection of AF screening in a primary care setting.

INTRODUCTION

Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia globally.[1] The Global Burden of Disease study estimated that AF affects over 37 million people globally[2 3] The lifetime risk of developing AF at age 55 is estimated to be 37%.[4] The risk of developing AF is significantly increased with age[4 5] and males are almost twice as likely as females to develop AF.[6]

In Ireland, AF is estimated to affect approximately 11% of the Irish population aged ≥65 years, with an incidence rate of 0.8%.[3] AF prevalence and incidence are projected to rise significantly, due to demographic change and increase of AF in advancing age and comorbidities, cardiovascular risk factors and change in lifestyles.[1 7 8] this will impose significant burdens on patients, society and health systems.

AF is a major risk factor for stroke alongside hypertension and smoking.[9] AF increases stroke risk fivefold.[9 10] Stroke is a leading cause of morbidity and mortality globally.[11] Stroke is Ireland's leading cause of acquired adult disability[12] and third-leading cause of death.[13] With a global ageing population, stroke prevention is a key public health priority.

AF is often asymptomatic, and patients are frequently diagnosed when they present with a stroke.[14 15] In Ireland, approximately 30% of patients who have had a stroke are found to have AF[16] and 60% of those who had AF knew of their condition prestroke.[16] If AF is identified oral anticoagulation (OAC) can be offered which can reduce stroke risk by up to two-thirds.[17]

Opportunistic AF screening is recommended nationally and internationally. In Ireland, the National Cardiovascular Policy recommended establishment of an AF screening programme.[18] The European Society of Cardiology (ESC) guidelines recommend opportunistic AF screening for the population ≥65 years.[19] The National Institute for Health and Care Excellence (NICE)[20] and the US Preventive Services Taskforce await emerging evidence regarding the risk of stroke in screen-detected asymptomatic AF compared with symptomatic/clinical AF before recommending screening.[19]

There are multiple ways to screen for AF including intermittent, opportunistic methods and continuous monitoring methods. Some intermittent AF screening modalities include pulse palpation, 12-lead ECG, mobile ECG devices, oscillometric devices and a number of smart devices including smartphones and watches. Intermittent screening methods can be employed as a single time point or can be repeated over a given timeframe. The continuous screening methods include implantable cardiac monitors, ambulatory ECG monitors and patches. Continuous AF screening methods provide high sensitivity and specificity. Sensitivity and specificity employing intermittent devices vary according to modality. Significant expense is associated with continuous monitoring compared with relatively inexpensive costs associated with intermittent monitoring depending on the modality employed.[21]

Community settings such as primary care have been identified as a good location to conduct AF screening and one-lead ECG devices have been reported as the preferred screening tool by the international collaboration AF-SCREEN.[22] Previous studies have found non-12-lead ECG devices to be more accurate than pulse palpation in the detection of AF.[23]

This study aims to explore the feasibility of AF screening in Ireland with a one-lead ECG device. The study builds on existing evidence from a screening study conducted in the West of Ireland, which used pulse palpation for screening.[3]

METHODS

A pilot screening study of opportunistic AF screening in primary care in the south of Ireland was conducted at the practices of participating general practitioners (GPs) from January 2021 to June 2022. The study was conducted in two phases: first, GP recruitment followed by patient recruitment. The GPs were recruited to the study following attendance at an information meeting and webinar, and the GPs recruited patients to the study.

The target population for recruitment to the study was patients ≥65 years attending a participating GP in the Cork and Kerry region in the south of Ireland. These counties are two large geographical regions located in the south of Ireland. The population ≥65 years in the region is approximately 107 000.[24 25] The study included opportunistic AF screening using a one-lead mobile ECG device, Kardia Mobile, blood pressure check with a standard sphygmomanometer and smoking status ascertainment. The study also collected data on medical history, current medication and onward referral.

Recruitment

General practitioners

420 GPs from the Cork and Kerry region in the south of Ireland were invited to participate in the study, the recruitment process is described in detail in the protocol.[26] In summary, a list of GPs from Cork and Kerry was obtained from the Irish health service. These GPs were invited to an information meeting and webinar where study information packs and devices were distributed. The participating GPs signed a memorandum of understanding (online supplemental appendix). The target for recruitment to the study was 70 GPs who would each recruit approximately 60 patients each, as described in detail previously.[26] GPs were reimbursed for each patient screened.

Patients

Eligible patients were recruited into the study by their GP or practice nurse when attending a participating practice for any consultation including annual influenza vaccination, COVID-19 vaccination, medication review, chronic disease review, blood test or other consultation. The GP or practice nurse provided the patients with an invitation letter and participant information leaflet. All participating patients signed a patient consent form (online supplemental appendix). The target for recruitment to the study was 4000 patients.

Patient eligibility

All patients ≥65 years presenting at participating practices were eligible for participation in the study. Patients were ineligible if they were under 65 years, had an existing diagnosis of AF or were unable to provide informed consent.

Screening intervention

AF screening was conducted at the participating GP practices where GPs and practice nurses identified eligible patients when they attended the practice. Patients were screened for AF using a one-lead mobile ECG device of 30 s duration, Kardia Mobile, had a blood pressure check using a standard sphygmomanometer and ascertainment of the patient's smoking status. Patients in whom hypertension or smoking was identified were managed according to the practitioner's usual care. Hypertension was defined according to the ESC guidelines as systolic blood pressure reading of ≥140 mm Hg.[27] Patients in

whom AF was identified using the one-lead ECG underwent a 12-lead ECG. Patients with confirmed AF were assessed for commencement of OAC therapy using the Keele decision support tool.[28] Patients with newly diagnosed AF were provided with an information booklet 'Live Well with Atrial Fibrillation' provided by the Irish Heart Foundation.[28] Patients were followed up where required by secondary care at the discretion of their GP. The GPs recorded the data from all participating patients using a clinical report form (online supplemental appendix). Data were also collected regarding the patients' medical history; current medication use and secondary care referral. Current use of antiplatelet and anticoagulant medication was recorded in one singular question, see clinical report form in online supplemental appendix, and is referred to in the results as antithrombotics. The CHA_2DS_2-VASc (congestive heart failure, hypertension, age 75+, diabetes, previous stroke/transient ischaemic attack, vascular disease, age 65-74, sex) score was calculated by investigators using data from the GP clinical report form. A score of 'plus one' was given to females, all patients aged 65–74 years, and patients with a history of heart failure, hypertension, diabetes prior myocardial infarct or peripheral vascular disease. A score of 'plus two' was given to all patients aged ≥75 years, and those with a history of stroke or TIA. The scores were totalled for each participant with the maximum possible CHA_2DS_2-VASc score of 9.

Data collection

Participating practices provided anonymised patient data to researchers using a clinical report form. This was returned to researchers by post or email.

Data management

The data management plan for the study was designed and executed in compliance with the research data management policy at University College Cork (UCC).[29] Encrypted investigator devices set to automatically lock during periods of inactivity were used to store the data. All the data files and variables were systematically and consistently named to aid archiving and reuse. As indicated by UCC's research data management policy all data will be retained for a period of ten years. A database was set up in Microsoft Excel to record all the variables for each participant. A data entry team conducted all the data entry for the study. The data entry team was trained ahead of performing data entry and performed visual checking against original clinical report forms (CRFs). The data were cleaned in Excel by one member of the data entry team and exported into Stata statistical package for data analysis.

Statistical analysis

Statistical analyses were carried out using Stata statistical package version SE V.17.0. Quantitative analysis of the data calculating means and proportions of variables including age profile, gender, body mass index, smoking status were used to describe the demographic of the population screened and compare the overall screened population with those with incident AF. The yield, the number of new AF cases, of the pilot screening programme was calculated.

Patient and public involvement

A patient representative from the Irish Heart Foundation was consulted prior to commencement of the study and attended the information evening for GPs. The patient representative subsequently provided the information booklets 'Live Well with Atrial Fibrillation' on AF, provided by the Irish Heart Foundation[28] (online supplemental appendix).

A patient and public involvement (PPI) panel was established and consulted on three occasions over the course of the study to include patient perspectives at the study implementation level. The PPI panel was recruited via email, social media platforms and patient groups. The PPI panel included eight contributors, four female and four male, who were patients, carers or family members of patients with a diagnosis of AF, stroke or both.

RESULTS

The pilot AF screening study was due to commence in February 2020 but paused due to the COVID-19 pandemic, the study subsequently commenced in January 2021. Of 420 GPs invited to participate in the pilot screening programme 72 (17%) GPs agreed to participate in the study and 52 (12%) GPs returned data (figure 1). Of those who returned data 28 (82%) practices were in Cork and 6 (12%) were in Kerry. The participating practices included urban and rural locations, and ranged in size from single to multidoctor practices, with up to nine GPs. Of the participating GPs, 33 (63%) were male and 19 (37%) were female. The participating GPs screened

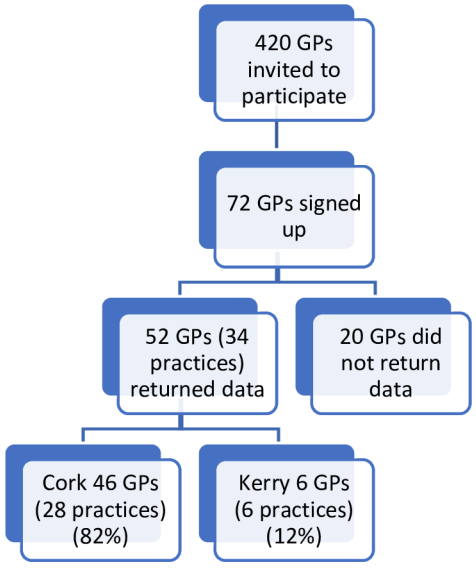

Figure 1 Flow chart of GP recruitment. GPs, general practitioners.

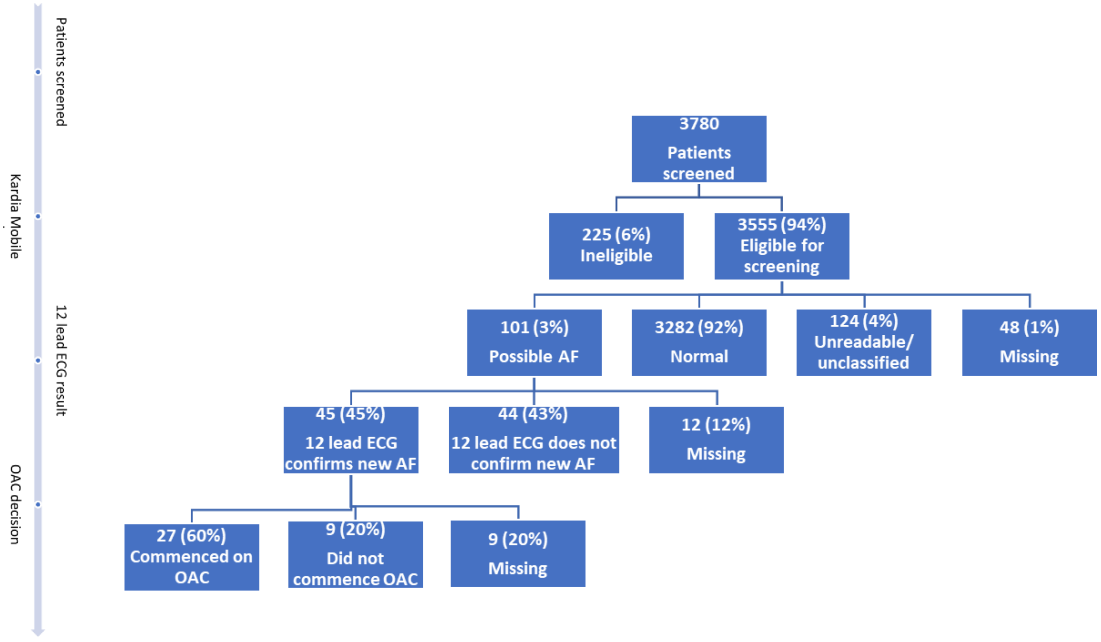

Figure 2 Flow chart of AF screening. AF, atrial fibrillation; OAC, oral anticoagulation.

a total of 3780 patients for AF. The number of clinical forms returned by each of the practices ranged from 16 to 474. Participants who were ineligible (n=225) for the study were excluded from the analysis as these patients were either <65 years or had an existing diagnosis of AF (figure 2).

Almost half, 1720 (48%), of the population screened were female with 705 (20%) aged 65–69 years, 1165 (33%) 70–74 years, 820 (23%) 75–79 years and 737 (20%) aged 80+ years. Of the population screened, 2464 (70%) were overweight or obese and 2252 (63%) were never smokers. At the screening visit half, n=1780, of the population screened were hypertensive (table 1). The most frequently recorded reason for visit was 'other' 1981 (56%), followed by chronic condition 738 (21%). In a free text box, 114 (6%) of 'other' visits were described as COVID-19 vaccination visits.

The most frequently recorded medical condition in the medical history was hypertension present in 2168 (61%) of the population with 651 (18%) having diabetes. The most reported medication was cholesterol lowering agent at 2065 (58%), followed by ACE Inhibitors at 1330 (37%) (table 2).

The results of the screening test as per the Kardia Mobile device are displayed in figure 2. A normal sinus rhythm was recorded in 3282 (92%), with 'possible AF' reading recorded in 101 (3%), an unreadable or unclassified reading was recorded in 124 (4%), while in 48 (1%), the Kardia reading was not recorded.

Of the screened patients who had a possible AF reading, 68 (67%) were male, 25 (25%) were female, data on gender were missing for 9 (9%) (table 1). Advancing age was an important factor with the highest proportion of possible AF readings occurring among patients aged 80+, 37 (36%) (table 1).

Of the possible AF cases, 45 (45%) had a confirmed diagnosis of AF on 12-lead ECG. Of the confirmed AF cases 33 (74%) were male, 6 (13%) were female, gender data were missing for 6 (13%) of cases. In terms of age the largest number of confirmed AF cases were in the 80+ age category 17 (38%). Among confirmed AF cases, 25 (56%) were hypertensive (table 1).

A total of 27 (60%) of newly confirmed AF cases were commenced on OAC therapy while 20% (9) were not commenced on OAC. Of the 45 newly confirmed AF cases, 26 were recorded as already taking some form of antithrombotic therapy in the current medication section of the CRF. There were 45 patients with a new diagnosis of AF, of whom 26 (58%) were already taking an antithrombotic therapy. Of the remaining 19, 11 (58%) were commenced on OAC while 5 (26%) were not commenced on OAC, for the remaining 3, the data were missing.

CHA_2DS_2-VASc scores

The CHA_2DS_2-VASc scores for the population screened ranged from 0 to 8. The mean CHA_2DS_2-VASc score was 2.9 (95% CI 2.8 to 3.0), the mean CHA_2DS_2-VASc for females was 3.4 (95% CI 3.3 to 3.4), for males was 2.4 (95% CI 2.3 to 2.5). Almost 90% of the population screened had a CHA_2DS_2-VASc score of ≥2. Among the patients screened, a CHADSVASC score of ≥2 was identified in 99% of the females and 80% of the males (table 3).

The CHA_2DS_2-VASc scores of patients who commenced on OAC ranged from 1 to 6 with 85% having a CHA_2DS_2-VASc score of ≥2. The CHA_2DS_2-VASc scores of patients not commenced on OAC ranged from 2 to 5 with all patients having a CHA_2DS_2-VASc score of ≥2 (table 4).

Table 1 Screened population characteristics and risk factors

	Total screened population	Possible AF	Confirmed AF
	N=3555 (%)	N=101 (%)	N=45 (%)
Gender			
Female	1720 (48)	25 (25)	6 (13)
Male	1698 (48)	68 (67)	33 (74)
Age categories			
65–69	705 (20)	16 (16)	8 (18)
70–74	1165 (33)	26 (26)	9 (20)
75–79	820 (23)	18 (18)	9 (20)
80+	737 (20)	37 (36)	17 (38)
BMI kg/m^2			
Healthy	1053 (29)	39 (38)	14 (31)
Overweight	1476 (42)	30 (30)	15 (33)
Obese	988 (28)	32 (32)	16 (36)
Smoking status			
Never	2252 (63)	59 (58)	27 (60)
Ex	953 (27)	30 (30)	14 (31)
Current	285 (8)	9 (9)	2 (5)
Hypertension			
Hypertensive	1780 (50)	51 (50)	25 (56)
Normotensive	1753 (49)	48 (48)	19 (42)

Underweight category was combined into the healthy category due to small numbers.
Absolute counts may vary due to missing data in some variables (data not recorded on the clinical report form).
AF, atrial fibrillation; BMI, body mass index.

DISCUSSION

This study investigated the feasibility and yield of opportunistic AF screening with mobile ECG technology in primary care. The feasibility of AF screening in primary care is demonstrated by the uptake of screening by GPs enrolled in the study. Despite challenges relating to COVID-19, the participating GPs implemented the pilot AF screening programme. Opportunistic AF screening in this study led to identification of new cases of AF in patients ≥65 years, with an incidence rate of 1.3%. The study also identifies potential opportunities for screening. Patients attending for routine vaccination or a chronic disease management may be an ideal opportunity to conduct AF screening.

Less than one-half (n=45 (45%)) identified as possible AF (n=101) by the one-lead ECG were confirmed by the 12-lead ECG. There may be a number of reasons for this divergence between 1-lead and 12-lead ECG. There is usually a delay in screening a patient using a mobile device and undertaking a 12-lead ECG during which time the patient may revert to sinus rhythm. Our study did not quantify the time delay between screening and 12-lead ECG. Thus, the one-lead ECG device may facilitate the diagnosis of paroxysmal AF in primary. Previously guidelines recommended 12-lead ECG was required in the definitive diagnosis of AF. However, more recent 2020 ESC guidelines conclude that 12 lead or single lead ECG of ≥30 is diagnostic of AF.[30] AF burden which refers to the time spent in Atrial high rate episodes (AHRE)/subclinical AF during a monitoring period. The AF burden can only be determined by continuous monitoring.[30] Subclinical AF on continuous cardiac monitoring duration can vary and the risk of adverse events such as stroke varies accordingly.[31]

There may also be some technical issues with using the device in older patients as reported anecdotally by the GPs such as patient tremor and poor connection to the device. A systematic review and meta-analysis of methods for detecting AF concluded that blood pressure monitors and non-12-lead ECG were the most accurate for detecting AF with a sensitivity of 0.91 (95% CI 0.86 to 0.94), specificity of 0.95 (95% CI 0.92 to 0.97), for non-12-lead ECGs. The authors concluded that pulse palpation was inferior to non-12-lead ECG for the detection of AF.[23]

Both the NICE[20] and the ESC[30] recommend OAC therapy for patients with AF. There appears to be a gap in the initiation of OAC therapy in confirmed cases of AF in this study. This study found that 58% of confirmed AF cases were already taking OAC therapy and 58% of the remaining confirmed cases were commenced on OAC. However, 26% of patients with newly diagnosed AF in this study were not commenced on OAC. Previous research suggests that patients with AF are suboptimally orally anticoagulated. A review of anticoagulant therapy in AF patients by Lowres *et al* reported that while there was an overall increase in the proportion of high-risk AF patients receiving OAC, the figures remained suboptimal. The rates of OAC in high-risk patients were reported as 60%–75% in the UK, Western Europe and USA and 50%–55% in Asian countries.[32] In Ireland, the latest report from the National Stroke Register found that among people with AF discharged from hospital following an ischaemic stroke 69% were prescribed an anticoagulant.[33] Suboptimal OAC in patients with AF is a clinically important area for further research.

Guidelines recommend OAC in patients with diagnosed AF where CHA2DS2-VASc scores are ≥2 for males and ≥3 for females and recommend considering OAC where CHA2DS2-VASc scores are ≥1 for males and ≥2 for females.[30] There may be some exceptions to this particularly with device-detected AF such as those detected through continuous monitoring, for example, cardiovascular implantable electronic device (CIED). AF duration in device-detected AF has been found to interact with CHA2DS2-VASc and may alter decisions on OAC in patients where the scores are at the thresholds.[34] Recent ESC guidelines accept AF screening using one-lead ECG technology as diagnostic and advise that these patients should be considered for OAC.

Table 2 Screened population medical history and current medication

	Total population N=3555 (%)	Possible AF N=101 (%)	Confirmed AF N=45 (%)
Medical history			
Hypertension	2168 (61)	58 (57)	27 (60)
Previous cardiovascular disease*	500 (14)	15 (15)	8 (18)
Heart failure	184 (5)	9 (9)	5 (11)
Previous history AF†	38 (1)	6 (6)	4 (9)
Peripheral vascular disease	55 (1)	0	0
Stroke/TIA	214 (6)	9 (9)	3 (7)
Intracranial bleed	11 (0.3)	0	0
Diabetes	651 (18)	23 (23)	12 (27)
Thyroid disease	322 (9)	6 (6)	2 (4)
Renal disease	219 (6)	6 (6)	0
Current medication			
Cholesterol lowering agent	2065 (58%)	56 (55%)	22 (49%)
ACE Inhibitors	1330 (37%)	36 (36%)	18 (40%)
Angiotensin receptor blockers	297 (8%)	8 (8%)	4 (9%)
Calcium channel blocker	942 (26%)	27 (27%)	10 (22%)
Diuretic	539 (15%)	17 (17%)	6 (13%)
Antithrombotic‡	1247 (35%)	46 (45%)	26 (58%)
Beta blocker	799 (22%)	35 (35%)	18 (40%)
Antiarrhythmic	26 (0.7%)	1 (1%)	1 (2%)
Digoxin	9 (0.2%)	0	0
Thyroid replacement therapy	350 (10%)	6 (6%)	2 (4%)

*Previous cardiovascular disease (CVD) including (CVD)/myocardial infarction/coronary artery bypass grafting.
†People who had previous diagnosis of AF and no longer have a current diagnosis.
‡Antithrombotic including: warfarin, aspirin and direct oral anticoagulation.
AF, atrial fibrillation; TIA, trans ischaemic attack.

Comparison with existing literature

The yield of patients with newly detected AF in this study is similar to other studies nationally and internationally.[3 35] A previous study conducted in the west of Ireland reported a new AF incidence rate of 0.8% via pulse palpation.[3] In Australia, an AF screening study AF SMART reported an incidence rate of new AF of 1.1%.[35] There was a higher proportion of AF detected in participants aged 80+ years and in males. This is consistent with existing evidence where advancing age is a major

Table 3 CHA_2DS_2-VASc (Congestive heart failure, hypertension, age 75+, diabetes, previous stroke/transient ischaemic attack, vascular disease, age 65-74, sex) scores by gender

CHA_2DS_2-VASc	Total N=3555 (%)	Female N=1720 (%)	Male N=1698 (%)	Missing data N=137 (%)
0	11 (<1)	0	10 (1)	1 (1)
1	390 (11)	18 (1)	331 (19)	41 (30)
2	1055 (30)	363 (21)	640 (38)	52 (38)
3	1089 (31)	576 (34)	484 (29)	29 (21)
4	725 (20)	554 (32)	160 (9)	11 (8)
5	200 (6)	144 (8)	54 (3)	2 (1)
6	73 (2)	56 (3)	16 (1)	1 (1)
7	11 (<1)	8 (1)	3 (<1)	0
8	1 (<1)	1 (<1)	0	0

Table 4 CHA_2DS_2-VASc (Congestive heart failure, hypertension, age 75+, diabetes, previous stroke/transient ischaemic attack, vascular disease, age 65-74, sex) scores of confirmed AF cases by OAC commencement

CHA_2DS_2-VASc	AF confirmed on 12 lead ECG N=45 (%)	Not commenced on OAC N=9 (%)	Commenced on OAC N=27 (%)	OAC data missing N=9 (%)
1	5 (11)		4 (15)	1 (11)
2	19 (42)	4 (45)	13 (48)	2 (22)
3	10 (22)	2 (22)	5 (18)	3 (33)
4	6 (14)	1 (11)	3 (11)	2 (22)
5	3 (7)	2 (22)	1 (4)	
6	1 (2)		1 (4)	
7	1 (2)			1 (11)

AF, atrial fibrillation; OAC, oral anticoagulation.

risk factor for AF and males are almost twice as likely as females to develop AF.[6]

Previous studies have reported suboptimal OAC in people newly diagnosed with AF.[36] The introduction of direct OACs (DOACs) has improved initiation of OAC therapy in recent years but despite this OAC initiation remains suboptimal. Lowres *et al* summarised existing evidence on OAC in AF and reported that only 50%–70% of patients whose CHA_2DS_2-VASc≥2 were treated with OAC. This was reported to vary significantly between countries ranging from 60% to 70% in the UK, the USA and Europe and reportedly lower in Asian countries ranging from 50% to 55%.[32] This study found 60% of confirmed AF cases were commenced on OAC. The reasons for not initiating OAC were not sought or identified in this study. This study confirms the urgent need to address this gap in the literature, with potential important implications for both patients with AF and the wider healthcare landscape.

Strengths and limitations

The main strength of this study is that it provides an estimate of new AF incidence in Ireland. The study included a diverse sample across two large counties in the south of Ireland with male and female GPs from small and large, rural and urban practices. The study spans the COVID-19 global pandemic making initial GP and patient recruitment difficult. This was overcome by using this apparent adversity and harnessing the COVID-19 vaccination scheme as an opportunity to conduct AF screening. We screened 94% of the target 4000 patients.

In Ireland, a severe paucity clinical research infrastructure makes research in primary care especially challenging, and GP practices are not routinely supported or resourced for clinical research. There are no dedicated staff for research purposes, so research participation is precariously based on individual practice enthusiasm and resource availability. Ireland does not have unique identifiers for healthcare purposes. This can make accessing and linking data for research purposes difficult, and the resulting data can be incomplete. However, this study clearly demonstrates an enthusiasm and capacity for clinical research in Irish general practice.

The paroxysmal nature of AF can make early and accurate diagnosis of asymptomatic AF difficult. The time elapsed between a screen positive case and a diagnostic 12-lead ECG may enable the patient to return to sinus rhythm. This is a factor for policy-makers to consider when designing community-based screening programmes.

Adherence to protocol may also be a limitation of the study, it is likely that some of the possible AF cases may not have had the required 12-led ECG to confirm the diagnosis. There were some missing data on the clinical report forms returned especially the 12-lead ECG in the confirmation of AF. The reason for not commencing patients on OAC was not recorded.

This was an opportunistic screening programme of asymptomatic patients. Patient symptoms related to AF were, therefore, not collected as part of this study. This may, however, limit the interpretation of the results.

Data relating to antithrombotic medication were recorded as one single data point on the clinical report form. Ideally, this would have been recorded as separate data points including antiplatelet and vitamin K antagonist or DOAC. More robust trialling of the CRF may have highlighted this as a limitation and future research could benefit by adopting a more robust approach to collection of this data in the future studies.

Future research

Further research is warranted to explore the risk of stroke and the merits of prophylactic OAC in screen-detected asymptomatic AF compared with clinical/symptomatic AF. Many patients with confirmed AF are not commenced on OAC. There are profound clinical implications of not initiating OAC in these patients with AF at high risk of severe stroke. These OAC prescribing patterns in this small but high-risk patient subgroup merit urgent and close scrutiny.

CONCLUSION

One-lead ECG screening for AF appears to be feasible in Irish general practice and may prove useful for early detection of AF, including paroxysmal AF. In this study, 45 new cases of AF were identified and 60% of those were commenced on OAC. Screening can lead to detection of new cases of AF. The one-lead Kardia Mobile device may also be useful for detecting incident cases of asymptomatic paroxysmal AF in a primary care setting. These findings may inform a national AF screening programme in Ireland.

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Contributors AC takes full responsibility for the content of the manuscript. AC contributed to the conceptualisation, methodology, project administration, data collection, data entry and analysis, wrote the initial draft of the manuscript, and contributed to the review and editing of the manuscript. CBradley contributed to the conceptualisation, funding acquisition, methodology, supervision, and the review and editing of the manuscript. DQ contributed to the conceptualisation, funding acquisition, methodology, supervision, and the review and editing of the manuscript. PMK contributed to methodology, data analysis, supervision, and the review and editing of the manuscript. SO'S contributed to funding acquisition and the review and editing of the manuscript. AC, GTYZ, AC and MWH contributed to data entry.

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