

Gender differences in atrial fibrillation risk factors, presentation, and management in Tabuk, Kingdom of Saudi ArabiaAbdullah Sahban Alshamrani¹, Bader Dhafer Alqarni¹, Hyder Osman Mirghani²¹ Faculty of Medicine, University of Tabuk, Tabuk, Saudi Arabia² Associate Professor of Internal Medicine and Endocrine, Medical Department, Faculty of Medicine, University of Tabuk, Tabuk, Saudi Arabia**Type of article:** Short report**Abstract****Background:** There is a lack of data regarding gender differences in atrial fibrillation presentation and clinical characteristics in Saudi Arabia.**Objective:** To assess gender differences in atrial fibrillation risk factors, presentation, and management strategy in Tabuk.**Methods:** This retrospective cross-sectional study was conducted in King Fahad Specialist Hospital in Tabuk City, Saudi Arabia. The medical records of all patients with atrial fibrillation in the years 2016 and 2017 were approached using a structured questionnaire to collect demographic factors, atrial fibrillation risks including diabetes, hypertension, ischemic heart disease, valvular heart disease, respiratory diseases (Bronchial Asthma, chronic obstructive airways disease, and pulmonary fibrosis), cardiomyopathy, thyrotoxicosis, and congenital heart disease. The different types of atrial fibrillation, management strategy, and complications were also reported. IBM-SPSS version 20 was used for data analysis. The Chi-square test was applied to compare men and women.**Results:** There were 93 patients with atrial fibrillation (59.2% males), hypertension, diabetes, ischemic heart disease, cardiomyopathy, thyrotoxicosis, congenital heart disease, and valvular heart disease was evident in 72%, 31.2%, 32.1%, 9.7%, 2.2%, 2.2%, and 10.7% respectively, while respiratory diseases, chronic atrial fibrillation, rate control strategy, and stroke were reported in 7.6%, 70.9%, 68.8%, and 16.1% of patients respectively. Women were older and had more paroxysmal atrial fibrillation with significant statistical differences ($p=0.010$). No significant differences were evident regarding other characteristics.**Conclusion:** No significant differences were found between males and females except age and paroxysmal atrial fibrillation, which were higher among women.**Keywords:** Gender difference, Atrial fibrillation, Saudi Arabia**1. Introduction**

Atrial fibrillation (AF) is the most common sustained abnormal heart rhythm, or arrhythmia, worldwide. The likelihood of developing AF increases with age. The prevalence is 0.4% in the general population, 3-5% in those >65 years and 10% in subjects aged >eighty years (1). This dangerous arrhythmia is often associated with serious diseases including coronary heart disease, diabetes, hypertension, and heart failure (2). Serious complications like stroke and peripheral arterial disease may happen from thromboembolism. In the Kingdom of Saudi Arabia, hypertension is the most common risk factor followed by ischemic heart disease and smoking (3). AF is prevalent worldwide; it affects more than six million people in Europe. These numbers are projected to increase 2.5-fold by 2050 due to an aging population, improved survival of people with conditions which predispose AF (e.g., heart

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attack), and a higher incidence of AF itself. Alarming, AF is underdiagnosed and under-treated even though it causes severe strokes, many of which can be prevented (4). Literature is scarce on this morbid arrhythmia in the Kingdom of Saudi Arabia (5). The prevalence of atrial fibrillation risk factors including hypertension, diabetes mellitus, and ischemic heart disease are on the rise in the Kingdom of Saudi Arabia, while rheumatic heart disease is not uncommon (6). Gender differences in atrial fibrillation risk factors and outcomes have been discussed in previous literature with conflicting results, with some reporting a higher risk of stroke (7) and others reporting lower bleeding tendencies (8) among women. Less evidence is available on the complex interaction between atrial fibrillation, gender, heart failure, and ischemic heart disease (9). To our best of knowledge, no researchers have studied the gender differences in atrial fibrillation in Saudi Arabia in spite of a large proportion of the population at risk of this serious health problem. There is a need for recent data to identify the gender differences of the risk factors of this common cardiac arrhythmia for prevention and proper management when appropriate. Thus, we conducted this research to study the gender differences in atrial fibrillation risk factors, presentation and management in Tabuk, the Kingdom of Saudi Arabia.

2. Material and Methods

2.1. Research design and patient selection

This cross-sectional retrospective study was conducted at King Fahad Specialist Hospital. The patients' records from the cardiology unit during the years 2016 and 2017 were approached confidentially and the personal data and privacy was secured. All the patients above 18 years with atrial fibrillation were included and others with incomplete data were excluded.

2.2. Data collection

Atrial fibrillation was diagnosed by cardiologists depending on clinical findings or irregular pulse and a pulse deficit of >15, the diagnosis was confirmed by electrocardiogram according to the American College of Cardiology Guidelines (10). The data were collected by the first and second authors. A structured questionnaire was used, and the following information was collected: Age, sex, the risks of atrial fibrillation including ischemic heart disease, diabetes, hypertension, thyrotoxicosis, cardiomyopathy, valvular and congenital heart disease, and cigarette smoking. The types of atrial fibrillation (acute, chronic, persistent, or paroxysmal), type of therapy used including rate or rhythm control, cardiac pacing, and anticoagulation were also collected. The associate's respiratory diseases like bronchial asthma, pulmonary fibrosis, and chronic obstructive airway disease were also reported, as were stroke and peripheral arterial disease.

2.3. Ethics of research

The ethical committees of the Medical College, University of Tabuk, and King Fahad Specialist Hospital approved the research (Ref: 30.304, Date: July 09, 2017).

2.4. Statistical analysis

The Statistical Package for Social Sciences IBM© SPSS© version 20 (IBM© Corp, Armonk, NY, USA) was used for data analysis; the data were presented as percentages or mean± SD unless otherwise specified. The Chi-square test was used to compare women and men. A p-value of <0.05 was considered significant.

3. Results

There were 93 patients with atrial fibrillation, their ages mean± SD (64.60±16.10) years, 59.8% were women. Table 1 depicts the basic clinical characteristics in which the majority (72%) were hypertensive, nearly one third were affected by diabetes, cardiomyopathy was evident in 9.7%, 12.9% were cigarettes smokers, 2.2% had thyrotoxicosis and congenital heart disease, while recreational drug use was reported in 1.1%. In the present study, the majority (70.9%) had chronic atrial fibrillation, 11.8% had acute atrial fibrillation, and atrial fibrillation was persistent in only a minority (1.1%), while paroxysmal atrial fibrillation was reported in 10.7% of patients (Table 2). The present data showed ischemic heart disease in 31.2%, valvular heart disease in 10.7% of patients, while cardiomyopathy was demonstrated in 9.7% (Table 2). Regarding respiratory disease, bronchial asthma was found in 5.6%, lung fibrosis in 1.1%, and chronic obstructive airway was not reported among the study group (Table 2). In the current study, the majority (68.8%) of patients with atrial fibrillation received rate control therapy, rhythm control was shown in 11.8%, 9.7% were on anticoagulation drugs, and one patient had a cardiac pacemaker (Table 2). Table 2 shows vascular complication among patients with atrial fibrillation, in which 16.1 developed strokes and 2.2% developed a peripheral vascular injury. In the present study, men were younger than women with significant statistical difference (59.56±19.12 vs. 59.56±19.12, p=0.016). No significant statistical differences were evident regarding diabetes

(32.4% vs. 29.6%, p=0.776), hypertension (62.1% vs. 79.6%, p=0.067), thyrotoxicosis (2.7% vs. 1.9%, p=0.786), valvular heart disease (8.1% vs. 11.1%, p=0.637), ischemic heart disease (37.8% vs. 25.9%, p=0.277), and paroxysmal atrial fibrillation (16.2% vs. 7.4%, p=0.306), while chronic atrial fibrillation was commoner among females with significant statistical difference (81.5% vs. 56.7%, p=0.010) (Table 3).

Table 1. Age, sex, family history of atrial fibrillation, and atrial fibrillation risk factors among patients with atrial fibrillation

Character	n (%) / (mean± SD)	
Sex	Males	55 (59.2)
	Females	38 (40.2)
Diabetes	29 (31.2)	
Hypertension	67 (72)	
Thyrotoxicosis	2 (2.2)	
Cardiomyopathy	9 (9.7)	
Congenital heart disease	2 (2.2)	
Smoking	12 (12.9)	
Ischemic heart disease	29 (31.2)	
Valvular heart disease	10 (10.7)	
Recreational drugs	1 (1.1)	
Family history of atrial fibrillation	0 (0.0)	
Age (mean± SD)	64.60±16.10	

Table 2. Clinical and paraclinical features of the patients

Variables	n (%)	
Types of atrial fibrillation	Acute	11 (11.8)
	Chronic	66 (70.9)
	Persistent	1 (1.1)
	Paroxysmal	10 (10.7)
Echocardiography finding	Valvular heart disease	10 (10.7)
	Ischemic heart disease	29 (31.2)
	Cardiomyopathy	9 (9.7)
Respiratory diseases among patients with atrial fibrillation	COPD	0 (0.0)
	Bronchial asthma	6 (6.5)
	Lung fibrosis	1 (1.1)
Modalities of therapy among patients with atrial fibrillation	Rate control	64 (68.8)
	Amiodarone	11 (11.8)
	Pacemaker	1 (1.1)
	Anticoagulation	9 (9.7)
Vascular complications	Stroke	15 (16.1)
	Peripheral arterial disease	2 (2.2)

Table 3. A comparison between males (n=37) and females (n=54) patients with atrial fibrillation

Character	Males; n (%) / (mean± SD)	Females; n (%) / (mean± SD)	p-value*
Age (mean± SD)	59.56±19.12	67.74±12.78	0.016
diabetes	12 (32.4)	16 (29.6)	0.776
Hypertension	23 (62.1)	43 (79.6)	0.067
Thyrotoxicosis	1 (2.7)	1 (1.9)	0.786
Chronic atrial fibrillation	21 (56.7)	44 (81.5)	0.010
Valvular heart disease	3 (8.1)	6 (11.1)	0.637
Ischemic heart disease	14 (37.8)	14 (25.9)	0.277
Paroxysmal atrial fibrillation	6 (16.2)	4 (7.4)	0.306
Rate control strategy	24 (64.9)	13 (34.1)	0.445
Anticoagulation use	3 (8.1)	39 (72.2)	0.673
Crebrovascular disease	3 (8.1)	11 (20.4)	0.111

*Chi square test

4. Discussion

Atrial fibrillation is a common serious health problem, it is associated with various diseases and risk factors. In the current study, the majority of patients were hypertensive and nearly one third were affected by diabetes and ischemic heart disease. The current findings were similar to those of Hersi et al. (3) who concluded hypertension in 63.3%, and diabetes mellitus in 48%. A recent review and meta-analysis (11) drew the conclusion that rhythm control strategy seems to significantly increase the adverse events compared to rate control, which is the preferred treatment of most patients with atrial fibrillation unless there are unbearable symptoms or the patient is hemodynamically unstable or there are other specific reasons for the introduction of rhythm control. In the present data, rate and rhythm control were observed in 68.8% and 12.9% respectively and in line with current evidence. Similarly, Hersi and colleagues (3) observed that the rate control was the commonest management strategy (66.2%), while rhythm control was found in 12% and were in accordance to the present observation. The higher rate of smoking among the Saudi atrial fibrillation survey (23.5% vs. 12.9% in the current data) could be explained by the difference in the sample size or the conservative nature of the present sample. Atrial fibrillation is a heterogeneous disorder; the clinical pattern varies according to the type of care provided. A study conducted in Spain (12) observed permanent atrial fibrillation in 51% of those admitted to the internal medicine department and 30% of the patients admitted to the cardiology department. In the present study, acute and chronic atrial fibrillation were present in 11.8% and 70.9% respectively, similar results were observed in a study conducted in the central region of Saudi Arabia (4) which found acute atrial fibrillation in 21.8% and chronic atrial fibrillation in 78.1%. The lower rate of chronic pulmonary diseases (bronchial asthma, chronic obstructive pulmonary disease, and idiopathic pulmonary fibrosis) in the current study (7.7% in the current data compared to 31.8% in the previous study) could be due to a higher rate of risk factors including cigarette smoking, the atmospheric pollution in central Saudi Arabia or familial factors. In the current study, 9.7% of patients were on anticoagulants, which was lower than in other studies (12). The different treating physicians and the indication for anticoagulation could explain the differences, but in the face of relatively higher cerebrovascular (16.1%) and valvular heart disease (10.7%) in the present sample, there could be an under prescription of anticoagulants. The lower rate of valvular heart disease in our survey (10.7% vs. 23.6% in the central region of Saudi Arabia) could be explained by the higher rate of rheumatic disease in that region and the earlier time of the study which was conducted in 2011. A large-scale study conducted in 26 countries (13) concluded paroxysmal atrial fibrillation in 26.5%, persistent atrial fibrillation in 23.8%, while permanent atrial fibrillation was found in 49.6%, which were in contradiction to our study. Plausible explanations could be the difference in the sample size and the fact that the previous study was a real-life survey. However, the rates of cerebrovascular disease observed were slightly lower than the present study (11.7% vs. 16.1%). In the present study, men were generally younger than women, in similarity to Schnabel et al. (14). In the current survey, chronic atrial fibrillation was commoner among men, and while there were no significant statistical differences between males and females regarding paroxysmal atrial fibrillation and hypertension, the present findings are in contradiction to Potpara et al. (15), who observed a higher rate of paroxysmal atrial fibrillation and hypertension among females. The younger age of the previous study sample, as well as race and sample size, could explain the differences. The EUR Observational Research Programme pilot survey on atrial fibrillation (16) found no differences across gender regarding hyperthyroidism, diabetes mellitus, type of atrial fibrillation, oral anticoagulants use, rate control strategy, or previous stroke, similar to the present findings, however, the study observed a higher rate of valvular heart disease and lower rate of coronary artery disease among females, in contradiction to the present findings in which no significant differences were evident between men and women. The present findings are consistent with a recent study (16) which concluded no gender difference regarding stroke, and use of anticoagulation. The study observation of a higher use of rate control strategy is in similarity to the current finding. In the current study, females were eight years elder than males and had more chronic atrial fibrillation compared to men which is in line with the study of Schnabel et al. (13) who found similar results. Schnabel et al. concluded similar prescription rates of anticoagulation drugs among males and females in accordance with the current findings. The current data showed a similar rate of stroke between males and females similar to the previous study (13). During the previous years, an increasing rate of atrial fibrillation, introduction of new anticoagulation in particular non-vitamin K antagonists, and new guidelines for atrial fibrillation have been witnessed, which may explain the discrepancy between the current findings and previous research. The limitations of the study were the retrospective nature of the study, the small size of the sample, and the fact that the study was conducted at a single tertiary center, so generalization cannot be assured.

5. Conclusions

Females were older than males. No differences were found between males and females regarding atrial fibrillation presentation and management apart from paroxysmal fibrillation, which was commoner among women. The current

findings pointed to the high rate of paroxysmal atrial fibrillation among women and the need for home monitoring in case this morbid arrhythmia is suspected because normal electrocardiogram cannot exclude atrial fibrillation. Further prospective studies assessing home ECG monitoring for paroxysmal atrial fibrillation diagnosis are needed to prevent deleterious consequences of this common arrhythmia including stroke and cognitive impairment.

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Conflict of Interest:

There is no conflict of interest to be declared.

Authors' contributions:

All authors contributed to this project and article equally. All authors read and approved the final manuscript.

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