

# Epidemiologic Profile of Non-valvular Atrial Fibrillation and Related Risk Factors in a Tertiary Hospital in Tunisia

## Profil épidémiologique et facteurs de risque associés à la fibrillation auriculaire non valvulaire dans un centre de cardiologie tertiaire

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### RÉSUMÉ

AF is associated to increasing morbidity and mortality especially in the elderly population.

The aims of our study were to evaluate the clinical, biological and echocardiographic characteristics of patients with non-valvular AF and to identify their associated risk factors in Sfax hospital, southern Tunisia.

We conducted a retrospective cohort-type analysis of cardiology department records on patients diagnosed with non-valvular AF, discharged from January 2012 to June 2018.

A total of 177 patients were included in the study. The mean age was 67.7±12.1 years. 107 participants were females (60.5%). The univariate analysis showed that female gender was statistically associated with personal history of hypertension, renal failure, a CHA2DS2-VASc score ≥2, a HAS-BLED score > 3. An age < 65 years was significantly associated with palpitations and smoking. Overdose of vitamin K antagonists was higher in females, hypertensive patients and those aged above 65 years.

In conclusion, early discharge follow-up and continued optimization of guideline-directed medical therapy are essential to prevent complications.

### MOTS-CLÉS

Atrial fibrillation,  
epidemiologic  
profile,  
complications

### SUMMARY

**Introduction** : La fibrillation auriculaire (FA) est l'arythmie la plus fréquente dans le monde et est associée à une lourde morbidité cardiovasculaire.

**Objectifs** : Etudier les caractéristiques cliniques, biologiques et écho-cardiographiques de ces patients et les caractéristiques évolutives à court et à long terme.

**Méthodes** : Il s'agit d'une étude d'observation descriptive et analytique de type cohorte rétrospective portant sur 177 patients hospitalisés au service de cardiologie de l'hôpital Hedi Chaker de Sfax pour FA non-valvulaire du 1er janvier 2012 au 30 juin 2018.

**Résultats** : Un total de 177 patients a été inclus dans l'étude. L'âge moyen était de 67,7±12,1 ans. 107 participants étaient des femmes (60,5%). L'analyse univariée a montré que le sexe féminin était statistiquement associé à des antécédents personnels d'hypertension, d'insuffisance rénale, à un score CHA2DS2-VASc ≥2, à un score HAS-BLED > 3. Les patients âgés de moins de 65 ans étaient plus des tabagiques et présentaient plus de palpitations. Le surdosage en antagonistes de la vitamine K était plus élevé chez les femmes, les patients hypertendus et ceux âgés de plus de 65 ans.

**Conclusion** : Un suivi clinique et paraclinique régulier ainsi qu'une optimisation de la prise en charge thérapeutique des patients ayant une FA non valvulaire sont essentiels pour prévenir les complications.

### KEYWORDS

Fibrillation  
auriculaire, profil  
épidémiologique,  
complications

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## INTRODUCTION

The last three decades have been characterized by an exponential growth in knowledge and advances in the clinical treatment of atrial fibrillation (AF) (1). It is a serious cardiac rhythm disturbance and the most common arrhythmia encountered in clinical practice (2). As a progressive disease, AF is associated to increasing morbidity and mortality especially in the elderly population (3). Depending on the underlying pathophysiology, AF can be classified as valvular or non-valvular which donate a form characterized by absence of rheumatic mitral stenosis, mechanical or bioprosthetic heart valve or mitral valve repair (4). In clinical practice, the AF is classified according to the European Society of Cardiology (ESC) guidelines as following patters : first diagnosed AF, paroxysmal AF, persistent AF , Long-standing persistent AF and permanent AF(5). This clinical classification can be helpful in treatment decisions which should improve the life' quality of patients and attribute to the prevention of its main complications.

The aims of our study were to evaluate the clinical, biological and echocardiographic characteristics of patients with non-valvular AF and to identify their associated risk factors in Sfax hospital, southern Tunisia.

## METHODS

### Study design and sampling procedure

We conducted a retrospective cohort-type analysis of cardiology department records on patients diagnosed with non-valvular AF, discharged from January 2012 to June 2018.

### Inclusion criteria

All patients who presented a non-valvular AF and who were hospitalized in the cardiology department of the Hedi Chaker hospital in Sfax from January 2012 to June 2018.

### Exclusion criteria

Patients diagnosed with valvular AF were excluded from the study.

## Data collection and instrument measure

### Data collection

We studied medical records on 177 patients known with non-valvular AF. The questionnaire was filled by the investigators out at the cardiology department without consuming actual consultation time. It was made up of 5 parts: The first one comprised general information including socio-demographic and clinical data such as age, gender, profession, medical and surgical history, symptoms, hospital duration stay and clinical classification according to the European Society of Cardiology (ESC) guidelines (5). The second part comprised electrocardiographic characteristics of patients. The third part comprised echocardiographic characteristics. The left ventricular systolic function, mass and dimensions, the left atrium dimensions and the pulmonary arterial systolic pressure were determined. Findings were interpreted according to the American Society of Echocardiography and the European Association of Cardiovascular Imaging (6). The fourth part was about biological parameters such as the serum creatinine levels, with calculation of creatinine clearance according to Modification of Diet in Renal Disease (7), then, renal failure was classified according to the national Kidney Foundation practice guidelines for chronic kidney disease (8). Hemogram, ionogram in blood plasma, Thyroid Function Tests, serum magnesium, calcium and troponin and coagulation assay including whole blood prothrombin time (PT) and international normalized ratio (INR) were also recurred. The fifth part was composed of the short- and long-term follow-up (clinical and biological eVolution) and therapeutic modality of each patient.

The modified European Heart Rhythm Association score (EHRA) was calculated to assess the severity of the functional symptomatology of AF. The New York Heart Association functional classification (NYHA) was determined to test the physical examination and to classify the dyspnea. The CHA2DS2-VASc score was used to evaluate the risk of arterial thromboembolism and ischemic stroke. The HAS-BLED score was assessed to predict the bleeding risk. Findings were interpreted according to the ESC Guidelines for the management of AF (5).

## Statistical analysis

Statistical analysis was performed using the software “Statistical Package for the Social Sciences (SPSS) version 21”. The qualitative variables were expressed in number and percentage. For the quantitative variables, we checked the normality of the distribution by the Kolmogorov-Smirnov test and the Shapiro-Wilk test. An estimate of the means with their standard deviations and of the median with minimum and maximum was carried out. Associations between variables was done by hypothesis testing. After verification of conditions, comparison was made by Pearson’s “Chi2” test. Otherwise, Fisher’s test was used. Each value of Chi2 corresponds to a value of p known as the degree of significance. All tests were considered as statistically significant at  $p < 0.05$ .

## RESULTS

### Participants’ characteristics

A total of 177 patients were included in the study. The mean age was  $67.7 \pm 12.1$  years. As shown in table I, 107 participants were females (60.5 %), giving a male to female ratio of 0.65. of all patients, 108 (61%) were aged above 65 years and 35 patients (19.8%) were professionally active. Among AF patients, 115 (65%) cases were hypertensive, 50 patients were diabetics and 63 cases (35.6%) were anemics. There were 14 stroke patients (8%) and 53 patients with acute coronary syndrome (30%). Atrial Fibrillation patients were symptomatic in 164 cases (92.7%). The most frequent underlying symptom was palpitations noted in 83 patients (46.9%) followed by dyspnea in 71 patients (40.1%) among whom 31 patients were classified NYHA stage II (43.7%). According to their clinical classification, 93 patients were first diagnosed AF (52.5%) and 42 patients (23.7%) had a permanent AF. Anticoagulant treatment was indicated for 160 patients (90.4%), heart rate reduction treatment for 80 patients (45.2%) and slowing heart frequency treatment for 101 cases (57.1%).

**Table I.** Patients’ characteristics of the study participants

Variables	N	Percentage (%)
<b>Gender</b>		
Male	70	(39.5)
Female	107	(60.5)
<b>Age categories (years)</b>		
<40	4	(2.3)
0-64	65	(36.7)
≥65	108	(61)
<b>Profession</b>		
Active	35	(19.8)
No occupation	103	(58.2)
Retirement	39	(22)
<b>Co-morbidities</b>		
History of thromboembolic event	42	23.7
Acute coronary syndrome	30	17
Hypertension	115	(65)
Diabetes	50	(28.2)
Dyslipidemia	38	(21.5)
Anemia	63	(35.6)
Heart failure	22	(12.4)
Chronic respiratory disease	12	(6.8)
Renal disease	10	(5.6)
Renal failure*	13	(7.3)
Hypothyroidism	3	(1.7)
Renal failure	10	(5.6)
Neoplasia	9	(5.1)
Peptic ulcer	9	(5.1)
Sleep apnea syndrome	4	(2.3)
Pacemaker	4	(2.3)
Obliterating arterial disease of limbs	3	(1.7)
Non-cardiac surgery	40	(22.6)
Hemorrhagic accident	0	0
<b>Lifestyle behaviors</b>		
Tobacco use	42	(23.7)
Alcohol consumption	3	(1.7)
<b>Symptomatic patients</b>		
Palpitations	83	(46.9)
Chest pain	58	(32.8)
Asthenia	13	(7.3)
Syncope	27	(15.3)
Dyspnea	71	(40.1)
NYHA stage I	1	1.4
NYHA stage II	10	14.1
NYHA stage III	31	43.7
NYHA stage IV	29	40.8
<b>Clinical classification of AF</b>		
First diagnosed AF	93	(52.5)
Paroxysmal AF	18	(10.2)
Persistent AF	13	(7.3)
Long-standing persistent AF	11	(6.2)
Permanent AF	42	(23.7)
<b>Treatment modalities</b>		
Heart rate reduction	80	(45.2)
Slowing heart frequency	101	(57.1)
Anticoagulant treatment	160	(90.4)
<b>One-year follow up of AF patients</b>		
Over dose in K antivitamins	16	11
Hemorrhagic Stroke	2	1.4
Ischemic stroke	2	1.4
Heart failure	7	4.8

\*: renal failure is defined by a clearance of creatinine  $< 30$   
 N : Number ; % : Percentage ; AF: atrial fibrillation

## Clinical, biological and echocardiographic characteristics of patients according to gender

The univariate analysis showed that female gender was statistically associated with personal history of hypertension (OR=3.6;  $p<0.001$ ), personal history of

renal failure (OR=6.3;  $p=0.045$ ), a CHA2DS2-VASc score  $\geq 2$  (OR= 10.4;  $p<0.001$ ), a HAS-BLED score  $> 3$  (OR= 7.3;  $p= 0.003$ ) and creatinine clearance  $<60$  (OR= 2.9;  $p=0.002$ ). The male gender was statistically associated with smoking (OR= 0.014;  $p <0.001$ ) (table 2).

**Table 2.** Results of univariate analysis of clinical, biological and echocardiographic characteristics according to gender (part I)

Variables	Male patients (N=70) (N, %)	Female patients (N=107) (N, %)	Crude OR (95% CI)	p
<b>Age categories (years)</b>				
<65	37(53.6)	32 (46.4)	1	
$\geq 65$	33 (30.6)	75(69.4)	2.6 [1.4-4.9]	<b>0.002</b>
<b>Profession</b>				
Active	31 (88.6)	4 (11.4)	1	0.9
No occupation	0	103 (100)	$10^{-3}$	
Retirement	39 (100)	0	$10^{-3}$	
<b>Clinical classification of AF</b>				
First diagnosed AF	36 (38.7)	57 (61.3)	1	
Paroxysmal AF	9 (50)	9 (50)	0.63 [0.2-1.7]	0.37
Persistent AF	3 (23.1)	10 (76.9)	2.1 [0.5-8.1]	0.28
<b>Long-standing</b>				
persistent AF	6 (54.5)	5 (45.5)	0.52 [0.15-1.85]	0.31
Permanent AF	16 (38.1)	26 (61.9)	1.02 [0.48-2.17]	0.94
<b>Calculated Scores</b>				
<b>The CHA2DS2-VASc score</b>				
<2	32 (80)	8 (20)	1	<b>&lt;0.001</b>
$\geq 2$	38 (27.7)	99 (72.3)	10.4 [4.4-24]	
<b>The HAS-BLED score</b>				
$\leq 2$	68 (43.6)	88 (56.4)	1	<b>0.003*</b>
$>3$	2 (9.5)	19 (90.5)	7.3 [1.6-32]	
<b>Associated symptoms</b>				
<b>Symptoms on admission</b>				
No	5 (38.5)	8 (61.5)	1	0.9
Yes	65 (39.6)	99 (60.4)	0.9 [0.2-3]	
<b>Dyspnea (N=71)</b>				
NYHA stage I	1 (100)	0	-	-
NYHA Stage II	3 (30)	7 (70)	-	-
NYHA stage III	14 (45.2)	17 (54.8)	-	-
NYHA stage IV	9 (31)	20 (69)	-	-
<b>Palpitations</b>				
No	37 (39.4)	57 (60.6)	1	
Yes	33 (39.8)	50 (60.2)	0.98 [0.5-1.8]	0.95
<b>Chest pain</b>				
No	44 (37)	75 (63)	1	0.31
Yes	26 (44.8)	32 (55.2)	0.7 [0.3-1.3]	
<b>Syncope</b>				
No	59 (39.3)	91 (60.7)	1	0.89
Yes	11 (40.7)	16 (59.3)	0.9 [0.4-2.1]	
<b>Asthenia</b>				
No	66 (40.2)	98 (59.8)	1	0.5*
Yes	4 (30.8)	9 (69.2)	1.4 [0.4-5.1]	
<b>Personal history</b>				
<b>Stroke</b>				
No	55 (40.7)	80 (59.3)	1	0.5
Yes	15 (35.7)	27 (64.3)	1.2 [0.6-2.5]	
<b>Acute coronary syndrome</b>				
No	57 (38.8)	90 (61.2)	1	0.6
Yes	13 (43.3)	17 (56.7)	0.8 [0.3-1.8]	
<b>Hypertension</b>				
No	37 (59.7)	25 (40.3)	1	<b>&lt;0.001</b>
Yes	33 (28.7)	82 (71.3)	3.6 [1.9-7.03]	

**Table 2.** Results of univariate analysis of clinical, biological and echocardiographic characteristics according to gender (part 2)

Variables	Male patients (N=70) (N, %)	Female patients (N=107) (N, %)	Crude OR (95% CI)	p
<b>Diabetes</b>				
No	53 (41.7)	74 (58.3)	1	0.3
Yes	17 (34)	33 (66)	1.4 [0.7-2.7]	
<b>Dyslipidemia</b>				
No	56 (40.3)	83 (59.7)	1	0.7
Yes	14 (36.8)	24 (63.2)	1.1 [0.5-2.4]	
<b>Heart failure</b>				
No	69 (40.1)	103 (59.9)	1	0.3*
Yes	1 (20)	4 (80)	2.6 [0.2-24]	
<b>Pacemaker</b>				
No	69 (39.9)	104 (60.1)	1	0.4*
Yes	1 (25)	3 (75)	2 [0.2-19]	
<b>Chronic respiratory disease</b>				
No	67 (40.6)	98 (59.4)	1	0.3*
Yes	3 (25)	9 (75)	2 [0.5-7.8]	
<b>Renal failure</b>				
No	69 (41.3)	98 (58.7)	1	<b>0.045*</b>
Yes	1 (10)	9 (90)	6.3 [0.7-51]	
<b>Tobacco use</b>				
No	30 (22.2)	105 (77.8)	1	<b>&lt;0.00*1</b>
Yes	40 (95.2)	2 (4.8)	0.014 [0.003-0.063]	
<b>Alcohol consumption</b>				
No	67 (38.5)	107 (61.5)	1	<b>0.06*</b>
Yes	3 (100)	0	0.38 [0.3-0.46]	
<b>biological parameters</b>				
<b>INR</b>				
INR< 3	62 (38.5)	99 (61.5)	1	0.3
INR>3	8 (50)	8 (50)	0.6 [0.2-1.7]	
<b>creatinine clearance</b>				
>60	57 (47.1)	63 (52.9)	1	<b>0.002</b>
<60	13 (23.2)	44 (76.8)	2.9 [1.4-6.02]	
<b>Echocardiographic characteristics</b>				
<b>Left ventricular hypertrophy</b>				
No	65 (38.9)	102 (61.1)	1	0.4
Yes	5 (50)	5 (50)	0.6 [0.1-2.2]	
<b>Dilated left atrium</b>				
No	22 (42.3)	30 (57.7)	1	0.6
Yes	48 (38.4)	77 (61.6)	1.2 [0.5-2.7]	
<b>Left ventricular ejection fraction</b>				
>50%	48 (36.1)	85 (63.9)	1	0.1
<50%	22 (50)	22 (50)	0.5 [0.2-1.1]	
<b>One-year follow up of AF patients</b>				
<b>Rehospitalization after one year</b>				
No	65 (38.9)	102 (61.1)	1	
Yes	5 (50)	5 (50)	0.6 [0.1-2.2]	0.4
<b>Over dose in K antivitaminas</b>				
No	61 (73.9)	100 (62.1)	1	0.15
Yes	9 (56.3)	7 (43.8)	0.4 [0.1-1.2]	
<b>Hemorrhagic Stroke</b>				
No	70(40)	105 (60)	1	0.5*
Yes	0	2 (100)	0.6 [0.5-0.6]	
<b>Ischemic stroke</b>				
No	70(40)	105 (60)	1	0.5*
Yes	0	2 (100)	0.6 [0.5-0.6]	
<b>Heart failure</b>				
No	63 (38)	103 (62)	1	0.1*
Yes	7 (63.6)	4 (36.4)	0.3 [0.08-1.1]	

N: Number; %: percentage, OR: Odds ratio; CI: Confidence Interval  
\*fisher test was used

### Clinical, biological and echocardiographic characteristics of patients according to age

According to the univariate analysis, age > 65 years was statistically associated with a personal history of stroke (OR= 2.4; p=0.02); personal history of hypertension (OR=2.7; p=0.002), a CHA2DS2-VASc score  $\geq 2$  (OR=

28.3; p<0.001), a HAS-BLED score > 3 (OR= 15.4; p= 0.008) and creatinine clearance <60 (OR= 28.3; p=0.001). Age < 65 years was significantly associated with palpitations (OR= 0.3; p=0.001) and smoking (OR=0.3; p=0.002). No significant age differences were noted in the clinical classification of AF nor in echocardiographic characteristics (table 3).

**Table 3.** Results of univariate analysis of clinical, biological and echocardiographic characteristics according to age. (Part I)

Variables	Age<65 (N=69) (N, %)	Age >65 (N=108) (N, %)	Crude OR (95% CI)	p
<b>Gender</b>				
Male	37(52.8)	33 (47.1)		1
Female	32 (29.9)	75 (70.1)	2.6 [1.4-4.9]	0.002
<b>Clinical classification of AF</b>				
First diagnosed AF	40 (43)	53 (57)	1	
Paroxysmal AF	7 (38.8)	11 (61.2)	1.1 [0.4-3.3]	0.7
Persistent AF	4 (30.7)	9 (69.3)	1.7 [0.4-5.9]	0.4
Long-standing persistent AF	6 (54.5)	5 (45.5)	0.6 [0.1-2.2]	0.4
Permanent AF	12 (28.5)	30 (71.5)	1.8 [0.8-4.1]	0.1
<b>Calculated Scores</b>				
<b>The CHA2DS2-VASc score</b>				
<2	36 (90)	4 (10)		1
$\geq 2$	33 (24)	104 (76)	28.3 [9.3-85.6]	<0.001
<b>The HAS-BLED score</b>				
$\leq 2$	68 (43.6)	88 (56.4)		1
>3	1 (4.8)	20 (95.2)	15.4 [2-118]	0.008
<b>Associated symptoms</b>				
<b>Symptoms on admission</b>				
No	5 (38.5)	8 (61.5)		1
Yes	64 (39)	100 (61)	0.9 [0.3-3.1]	0.9
<b>Dyspnea (N=71)</b>				
NYHA stage I	0	1 (100)	-	-
NYHA Stage II	4 (40)	6 (60)	-	-
NYHA stage III	12 (38.8)	19 (61.2)	-	-
NYHA stage IV	7 (24.2)	22 (75.8)	-	-
<b>Palpitations</b>				
No	26 (27.7)	68 (72.3)		1
Yes	43 (51.8)	40 (48.2)	0.3 [0.1-0.6]	0.001
<b>Chest pain</b>				
No	46 (38.7)	73 (61.3)		1
Yes	23 (39.7)	35 (60.3)	0.9 [0.5-1.8]	0.8
<b>Syncope</b>				
No	59 (39.4)	91 (60.6)		1
Yes	10 (37.1)	17 (62.9)	1.1 [0.4-2.5]	0.8
<b>Asthenia</b>				
No	62 (37.9)	102 (62.1)		1
Yes	7 (53.8)	6 (46.2)	0.5 [0.1-1.6]	0.2
<b>Personal history</b>				
<b>Stroke</b>				
No	59 (43.7)	76 (56.3)		1
Yes	10 (23.8)	32 (76.2)	2.4 [1.1-5.4]	0.02
No	61 (41.5)	86 (58.5)		1
Yes	8 (26.7)	22 (73.3)	1.9 [0.8-4.6]	0.1

**Table 3.** Results of univariate analysis of clinical, biological and echocardiographic characteristics according to age. (Part 2)

Variables	Age<65 (N=69) (N, %)	Age >65 (N=108) (N, %)	Crude OR (95% CI)	p
<b>Hypertension</b>				
No	34 (54.8)	28 (45.2)		1
Yes	35 (30.5)	80 (69.5)	2.7 [1.4-5.2]	0.02
No	55 (43.3)	72 (56.7)		1
Yes	14 (28)	36 (72)	1.9 [0.9-3.9]	0.06
<b>Dyslipidemia</b>				
No	58 (41.8)	81 (58.2)		1
Yes	11 (29)	27 (71)	1.7 [0.8-3.8]	0.1
<b>Heart failure</b>				
No	68 (39.6)	104 (60.4)		1
Yes	1 (20)	4 (80)	2.6 [0.2-23.9]	0.3
<b>Pacemaker</b>				
No	69 (39.9)	104 (60.1)	-	1
Yes	0	4 (100)	-	0.9
No	67 (40.7)	98 (59.3)		1
Yes	2 (16.7)	10 (83.3)	3.4 [0.7-16.1]	0.1
<b>Renal failure</b>				
No	68 (40.8)	99 (59.2)	3.4 [0.7-16.1]	0.1
Yes	1 (10)	9 (90)		
<b>Tobacco use</b>				
No	44 (35.6)	91 (67.4)		1
Yes	25 (59.5)	17 (40.5)	0.3 [0.1-0.6]	0.002
<b>Alcohol consumption</b>				
No	66 (37.9)	108 (62.1)	-	-
Yes	3 (100)	0	-	-
<b>Biological parameters</b>				
<b>INR</b>				
INR< 3	65 (40.4)	96 (59.6)		1
INR>3	4 (25)	12 (75)	1.5 [0.4-5.5]	0.4
<b>Creatinine clearance</b>				
>60	60 (50)	60 (50)	28.3 [9.3-85.6]	1
<60	9 (15.8)	48 (84.2)		<0.001
<b>Echocardiographic characteristics</b>				
<b>Left ventricular hypertrophy</b>				
No	55 (43.3)	72 (56.7)		1
Yes	14 (28)	36 (72)	1.5 [0.3-6.01]	0.5
<b>Dilated left atrium</b>				
No	25 (48)	27 (52)		1
Yes	44 (35.2)	81 (64.8)	1.8 [0.8-4.2]	0.14
<b>Over dose in K antivitamins</b>				
No	61 (40.4)	90 (59.6)		1
Yes	8 (30.8)	18 (69.2)	1.3 [0.4-4.1]	0.5
<b>Hemorrhagic Stroke</b>				
No	69(39.5)	106 (60.5)	-	-
Yes	0	2 (100)	-	-
<b>Ischemic stroke</b>				
No	69(39.5)	106 (60.5)	-	-
Yes	0	2 (100)	-	-
<b>Heart failure</b>				
No	67 (40.4)	99 (59.6)		1
Yes	2 (18.2)	9 (81.8)	2.8 [0.5-13.6]	0.1

N: Number; %: percentage, OR: Odds ratio; CI: Confidence Interval

## Associated factors of vitamin K antagonists' overdose

Overdose of vitamin K antagonists was higher in females, hypertensive patients and those aged above 65 years. No significant difference was noted

according to the univariate analysis ( $p=0.58$ ;  $p=0.6$ ;  $p=0.35$ , respectively) Prevalence of overdose of vitamin K antagonists was less in patients treated with clopidogrel (10.5% vs 15.3%) or aspirin (10.6% vs 17.3%), but no significant association was found ( $p=0.5$ ;  $p=0.23$ , respectively) (table 4).

**Table 4.** Associated factors of vitamin K antagonists overdose

Variables	Vitamin K antagonists overdose		Crude OR (95% CI)	p
	Yes (N, %)	No (N, %)		
Age categories (years)				
<65	8 (11.6)	61 (88.4)	1	0.35
≥65	18 (16.7)	90 (83.3)	1.5 [0.62-3.71]	
Gender				
male	9 (12.9)	61 (87.1))	1	0.58
female	17 (15.9)	90(84.1)	1.28 [0.53-3.09]	
Personal history				
Thromboembolic event				
No	21 (15.5)	114 (84.5)	1	0.5
Yes	5 (11.9)	37 (88.1)	0.7 [0.25-2.08]	
Smoking				
No	17 (12.6)	118 (87.4)	1.89 [0.77-4.6]	0.169
Yes	9 (21.4)	33 (78.6)		
Diabetes				
No	15 (11.8)	112 (88.2)	1	0.09
Yes	11 (22)	39 (78)	2.1[0.89-4.97]	
Hypertension				
No	8 (12.9)	54 (87.1)		0.6
Yes	18 (15.7)	97 (84.3)	1.25 [0.5-3.07]	
Neoplasia				
No	25(14.9)	143 (85.1)	1	0.75
Yes	1 (11.1)	8 (88.9)	0.7 [0.08-5.96]	
Echo-biological characteristic				
FEVG				
<50%	10 (22.7)	34 (77.3)	1	0.087
>50%	16 (12)	117 (88)	2.1 [0.89-5.17]	
Cl creatinine < 30 ml/min				
No	23 (15.1)	129 (84.9)	1	0.45
Yes	3 (23.1)	10 (76.9)	1.68 [0.43-6.5]	
Anemia				
No	11 (11.5)	85 (88.5)	1	0.187
Yes	12 (19)	51 (81)	1.8 [0.7-4.4]	
Calculated scores				
HAS-BLED		0.9 []		
< 3	23 (14.7)	133 (85.3)	1	0.9
> 3	3 (14.3)	18 (85.7)	0.9 [0.2-3.5]	
Treatment				
clopidogrel				
No	24 (15.3)	133 (84.7)	1	0.5
Yes	2 (10.5)	17 (89.5)	0.65 [0.14-3]	
Aspirin				
No	19 (17.3)	91 (82.7)	1	0.23
Yes	7 (10.6)	59 (89.4)	0.56 [0.22-1.43]	

N: Number; %: percentage, OR: Odds ratio; CI: Confidence Interval



## DISCUSSION

We conducted this survey to understand the current status of non-valvular AF patients and to explore their associated factors. The mean age of our population was near from a recent Tunisian survey (9). The most common associated comorbidities to the non-valvular AF were hypertension, diabetes mellitus, and anemia. These findings were similar to those noted recently in Tunisia (9). Palpitations and dyspnea were the most presenting symptoms of non-valvular AF, these results are in keeping with those of an Asian study which found them as main symptoms (10). Above the half of our participants were classified in first diagnosed AF, and near to the quarter were in permanent AF which was different from what was noted in similar study showing that above the half of their patients were in permanent or persistent non-valvular AF (9). This difference could be related to the prospective methods used by the authors. Percentage of patients receiving anticoagulant drug in our survey (90.4%) was higher than other studies (9,11), this points to better care for patients with AF in Tunisia. Besides, no use of antiplatelet drugs in the AF patients treatment was noted in our survey while other authors reported their uses in 26 % (12) and 65.7% of patients (13).

It was not surprising that elderly patients were at higher risk of stroke, higher rates of CHA<sub>2</sub>DS<sub>2</sub>-VASc and HAS-BLED scores. Besides, younger age was statistically associated with palpitations, this finding was in line with another study saying that palpitations are more common in younger individuals (14). Higher levels of symptom severity in younger patients could be explained, possibly, by the fact of their higher level of anxiety over having a new diagnosis (15).

According to the associated factors of vitamin K antagonists overdose, other surveys identified advanced age and personal history of thromboembolic events as predictors of vitamin k antagonists overdose (5, 16, 17) while no significant difference was obtained in our study ( $p=0.3$ ;  $p=0.5$ , respectively)

A noteworthy finding in our survey that an acute decompensation in heart failure was less frequent in younger patients, females and non-hypertensive patients. These results were supported by other recent surveys (18,19). Besides, no significant association was found. According to the literature, non-cardiac conditions such as renal dysfunction, diabetes, anemia and uncontrolled hypertension

could be contributors of decompensation in heart failure (20,21). Nevertheless, there were no significant association in our results. Of more interest is the finding that taking diuretics after discharge from hospital which was significantly associated with the acute decompensation of heart failure. This was in line with another study (19) showing that diuretics with other antihypertensive treatments such as vasodilators and ARA II were associated with an increased risk of acute decompensation of heart failure.

## CONCLUSION

In conclusion, effective treatment of patients with atrial fibrillation includes rate control, rhythm control, stroke prevention, but also the management of cardiovascular risk factors and concomitant diseases in order to limit its complications. Early discharge follow-up and continued optimization of guideline-directed medical therapy are essential to prevent these complications. Finally, a Tunisian AF registry was developed and included patients with AF during a period of 3 months between March and May 2017. The results of this registry will help guide and optimize the management of patients with AF in Tunisia.

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