Delta of Egypt atrial fibrillation registry (DEAF registry)

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Abstract: ***Objective***: The Aim of the registry is to determine patient characteristics, practice patterns, and outcomes of AF in this region using registry's design, and finding if there is a gap between the results in the registry and the recent AF guidelines. ***Methods***: 500 patients with AF (whatever its type) were studied in the period of one year, during emergency room admission. The registry recruited patients from 8 hospitals in 8 cardiac centers in the region of the delta of Egypt (Tanta, Shebin-Elkom, Damanhour, Banha, Mansoura, Zagazig, Kafr-Elsheikh and Cairo). Hospitals were chosen from different geographical locations and selected to represent different settings of care (academic and non-academic, general and specialized, public and private) in the delta. DEAF registry team developed the registry protocol and case report form (CRF) and appointed a coordinator for each participating cardiac center. Screening of AF cases in the ER was carried out by contacting ER doctors and the cardiologists in each cardiac center, any patient ≥18 years of age and had AF documented on a 12-lead ECG or rhythm strip, lasting >30 seconds. All the data about the AF cases were collected by the coordinator in the participating cardiac center. ***Results***: 28.4% of our enrolled patients had heart failure, 51.4% patients were hypertensive and 31% patients were known to be diabetic. We found that 19% patients had rheumatic heart disease. And 24% patients had valvular heart disease (mitral or aortic heart disease). 33% patients had history of dyslipidemia, and finally 17% patients showed no obvious cause of AF. 30.4% patients had a history of coronary artery disease based on patients' words, 10.8% patients had prior Acute Coronary Syndrome (ACS) while 17.2% patients had prior Percutaneous Coronary Intervention (PCI) and 2.4% patients had prior Coronary Artery Bypass Graft (CABG). 47% of the patients had past medical history of atrial fibrillation, of them 45% complained of palpitation, 19% dyspnea and the same chest pain. ***Conclusion***: Our registry show that hypertension, coronary disease, and heart failure remain common comorbidities in our AF registry where hypertension account alone for about half the patients of atrial fibrillation. Rheumatic valvular heart disease, used to be an important underlying disease for the development of AF. Amiodarone is the commonest AAD used, while regarding rate control drugs, beta-blockers and digoxin were more often used than non-dihydropyridine calcium-channel blockers. Lone AF still high 17% and that reflects that shortage in diagnostic tools in discovering some co-morbidities such as the obstructive sleep apnea.
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Key words: Delta, registry, Egypt, atrial fibrillation, DEAF.

Introduction:

Atrial fibrillation (AF) is the most common serious cardiac arrhythmia, and the number of patients with AF is anticipated to increase in the next few decades. Although AF may develop in the absence of other diseases, it is frequently associated with other cardiac conditions including hypertension, coronary artery disease, and valvular heart disease. ***(1)***

Patients with AF have a 5-fold increase in the risk of stroke and a 2-fold increase in mortality ***(2-3).*** With rapid ventricular rate, they often complain of easy fatigability and palpitation and eventually may have tachycardia-induced cardiomyopathy and heart failure***. (4)***

Recent trials of new anticoagulant and new antiarrhythmic drugs are likely to influence future management guidelines ***(5-6).*** However, it has been shown that clinical practice often lags behind evidence-based treatment guidelines.

Disease registries are an effective tool to examine, in a real-life setting, patient characteristics, management, outcomes, and adherence to practice guidelines.

Many registries have been developed for acute coronary syndrome but few for other cardiac diseases including AF, and those were mostly carried out in Europe, North America. ***(7-8)*** and the Arabian GULF ***(9).*** Therefore, we took the initiative to carry out a

survey of AF in cardiac centers in the region of the Delta of Egypt.

Methods:

Patients

Among patients presented with AF in the emergency room, 500 patients were selected for this study. All participating hospitals agreed to and aimed for consecutive enrollment of patients. Patients were invited to participate in the registry if theywere≥18 years of age and had AF documented on a 12-lead ECG or rhythm strip, lasting >30 seconds. While they were in the ER, they were enrolled after giving written informed consent to participate in the study. Patients were included regardless of the reason for their visit to the ER. DEAF registry team appointed a principal investigator to conduct the registry. With the advice of the principal investigator, a steering committee was formed. The steering committee developed the registry protocol and case report form (CRF) and appointed a coordinator for each participating cardiac center.

Methods:

Delta of Egypt atrial fibrillation registry (DEAF registry) is a multi-governorate cardiac prospective, observational registry of patients with AF within 12-month, as enrollment started on June 2017 and ended on June 2018. The study was approved by the ethics committees of each cardiac center.

Data collected included, basic data of the patients, medical history of the PTN & Triggering factors & co morbidities, history of atrial fibrillation & analysis of the frequency & outcome, investigations and the medications.

Participating Centers:

The registry recruited patients from 8 hospitals in 8 cardiac centers in the region of the delta of Egypt (Tanta, Shebin-Elkom, Damanhour, Banha, Mansoura, Elzagazig, Kafr-Elsheikh and Cairo). Hospitals were chosen from different geographical locations and selected to represent different settings of care (academic and non-academic, general and specialized, public and private) in the delta.

Statistical analysis

Continuous variables were summarized using means or medians based on the normality; normally distributed variables were summarized using the mean and standard deviation (SD), while the non-normally distributed variables were summarized using the median. Categorical data were summarized as the frequency and percentage. All analyses were made by using SPSS 11.0.

Results:

Table 1: Showing the basic data of the patients & vital status. (n=500)

		NO	%
MEDICAL CENTER	TANTA	100	20
	DAMANHOUR	50	10
	BANHA	50	10
	SHEBIN	50	10
	MANSORA	50	10
	ZAGAZIG	50	10
	KAFR ELSHEKH	50	10
	CAIRO	100	20
AGE	Min. – Max Mean ± SD median	25-96 60.91 ± 16.77 59.50	
GENDER	male	266	53.2%
	female	234	46.8%
PRESENTATION	Stable	372	74.4%
	Unstable (*)	128	25.6%

(*) systolic blood pressure <90mmHg, diastolic blood pressure <60mmHg, patients presented with heart failure, recent acute coronary syndrome or stroke.

Table 2: Shows medical history of the patients. (n = 500)

Disease	No.	%
CORONARY ARTERY DISEASE	152	30.4
HTN	257	51.4
SMOKING	205	41
HEART FAILURE	142	28.4
RHD	95	19
CARDIAC SURGERY BEFOR	52	10.4
TIA	25	5
VASCULAR DISEASE	20	4
THROMBOEMBOLIC DISEASE	55	11
DIALYSIS	15	3
COPD	30	6
THYROID DISEASE	30	6
ANEMIA	50	10
NO OBVIOUS ETIOLOGY OF AF	85	17
DRUG HISTORY	40	8
DM	155	31
DYS LIPIDEMIA	165	33
CONGENITAL HEART DISEASE	20	4
SLEEP APNEA	25	5
ALCOHOL CONSUMPTION	10	2
CAROTID STENOSIS	35	7
VALVULAR HEART DISEASE	120	24
CHRONC KIDNEY DISEASE	43	8.6

NO, NUMBER; HTN, hypertension; RHD, rheumatic heart disease; TIA, transient ischemic attack ; COPD, chronic obstructive pulmonary disease ; DM, diabetes mellitus ; AF, atrial fibrillation.

Table 3: Past intervention of the patients (n=500)

		No	%
Past hx. of AF		253	47
Past intervention	Electrical	55	11
	pharmacological	210	42
	Both (E & P)	15	3
	Catheter ablation	10	2
	Surgical ablation	0	0
	AV node ablation)	0	0
	LAA occlusion	0	0

(E & P), Electrical and pharmacological ; AV, Atrio-ventricular

Table 4: Type of atrial fibrillation on presentation.

		NO	%
Type of AF	First diagnosed	235	47
	Paroxysmal	95	19
	Persistent	40	8
	Permanent	130	26

Table 5: Management the patients received in the ER and patients' rhythm at discharge.

		NO	%
Cardio version in ER & Management	Spontaneous	35	7
	Electrical (CV)	35	7
	Pharmacological (CV)	155	31
	Rate control	275	55
	other	0	0
PTN rhythm at time discharge from ER	sinus	220	44
	Atrial fibrillation	275	55
	Others (SVT, VT, VF)	5	1

Table 6: PTN outcome from emergency room.

		NO	%
PTN outcome from ER	Died	5	1
	Discharged Home	130	26
	Transferred to another hospital	20	4
	admitted	345	69

Table 7: Shows transthoracic echocardiographic (TTE) parameters (n=420)

	No				*No*	*%*
LV Ejection fraction	420	Min. – Max 16-71.0 Mean ± SD. 38.69±11.49 Median 35.0				
		EF <40%			142	33.8
		EF ≥40%			278	66.2
LV dimensions	420	Normal			298	70.95
		Dilated			122	29.04
Pulmonary HTN	420	Normal			190	45.2
		Mild			94	22.4
		Moderate			70	16.6
		Severe			66	15.7
Valvular Lesion	120	MV	STENOSIS (n=83)	*Mild*	21	25.3
				Moderate	35	42.16
				Sever	27	32.5
			REGURGE (n=37)	*Mild*	14	37.38
				Moderate	6	16.21
				Sever	17	45.94
		Combined MS & MR			13	3.1
	130	AV	STENOSIS (n=62)	*Mild*	25	40.32
				Moderate	25	40.32
				Sever	12	19.3
			REGURGE (n=68)	*Mild*	24	35.29
				Moderat	14	20.58
				sever	30	44.11
		Combined AS & AR			18	4.29
Bi -valvular lesion	43				43	10.23
others		Prosthetic valve			52	10.4

Table 8: laboratory parameters on presentation.

	N	Min. – Max.	Mean ± SD	Median
Creatinine (mg/dl)	220	0.60 – 9.50	1.65 ± 1.03	1.45
Urea (mg/dl)	220	19.0-215.0	68.92±39.78	75.5
Na (m Eq/L)	220	112.0-158.0	136.68±8.14	137
K (m Eq/L)	220	2.80-6.1	4.23±0.67	4.2
HGB (gm/dL)	190	7.30-16.0	11.67±1.96	11.4
INR unit	200	1.0-5.73	2.49±0.85	2.6
Troponin (ng/mL)	102		NO	%
		Positive	46	45.1
		negative	56	54.9

Table 9: pharmacological medical therapy in the emergency room (n=500)

		NO	
Medications for rate control (N=275)	Class‖ anti- arrhythmic drug	266	53.2
	Class 4 anti-arrhythmic drugs	153	30.6
	Digitalis	275	55
	Combined 2 medications	153	30.6
	Combined 3 medications	275	55
Medications for rhythmic control (N=155)	Class 1 anti -arrhythmic drugs	24	4.8
	Class 3 anti-arrhythmic drugs	131	26.2
Anti- platelet drugs	Aspocid & plavix	150	30
Anti-coagulant	Heparin & enoxaparine	190	38
Anti-failure drugs	Diuretics	123	24.6

Table 10: Medications on discharge.

Medication group	The medication	NO	%
B – blockers	Propranolol	51	10.2
	Carvedilol	55	11
	Metoprolol	18	3.6
	Bisoprolol	121	24.2
	Atenolol	30	6
Ca^{+2}– Channel blockers	Verapamil	104	20.8
	Diltiazem	49	9.8
Cardiac glycosides	Digitalis	275	55
	Propafenon	16	3.2
Specific medications	Amiodarone	115	23
Anti-platelets medications	Aspocid	344	68.8
	Plavix	93	18.6
	Brilique	30	6
Diuretics	Furosemide	180	36
ACE inhibitors	captopril	271	54.2
Anti- coagulant (VIT -K antagonist	warfarin	365	73
Novel anti-coagulant	Dabigatran	0	0
	Apixaban	22	4.4
	Edoxaban	0	0
	Rivaroxaban	31	6.2
Dual anti-platelet		123	24.6
Triple therapy		54	10.8

Discussion

AF is the most common arrhythmia worldwide and is also a common cause of hospital admission in delta regions ,and there has been recent increase interest in AF because of the expected rise in its prevalence ***(1).***

The mean of the age of to our patients was 60.96, that was lower than the mean of age to the AF patients in (PREFER in AF) ***(10)*** that was71,5, On the other hand the mean of age to our patients was very close to the patients from the Kuwait82 and (Gulf SAFE) ***(9)*** that was 57, This can be explained by a younger population structure in developing as compared with developed countries and presence of rheumatic heart diseases remains a major cause of morbidity and premature death in developing countries than the developed countries ***(12).***

The incidence of atrial fibrillation in males was more than females and these results with (PREFER in AF) ***(10)*** and (Gulf SAFE) ***(9)*** that is may be due to the risk factors such as ischemic heart disease and HTN. the IHD develops on average 7–10 years later in women compared with men86and Incidence of hypertension more in males than females ***(13)***, all these explains the more prevalence of male patients with atrial fibrillation than female.

DEAF REGISTRY mainly emergency room registry so 25.6% of the patients were unstable (systolic blood pressure <90mmHg, diastolic blood pressure <60mmHg, patients presented with heart failure, recent acute coronary syndrome or stroke), while 74.4% was stable in attendance to the emergency room.

A review of medical history and risk factors showed that a little more than half of our patients have reported a history of hypertension 51.4% that is close to what reported by gulf registry of AF ***(9)*** ,while the risk factor of HTN in (AFNET registry) ***(7)*** and (PREFER in AF) ***(10)*** was more high by about 17% and from these, the hypertension considered the most important risk factor in AF and the more burden of HTN on the developed countries.

Diabetes mellitus (DM) and dyslipidemia was reported as risk factors in about one third of the Patients of atrial fibrillation the incidence is close to that in (GULF CARE) ***(9)*** in DM and dyslipidemia, on the other hand the risk factor of DM on AF about 22.4% in (PREFER in AF) ***(10)***, less by about 7% that may be explained by the bad habits of the patients in the developing countries make the patients more BMI than European patients ***(14)*** and that predispose DM ***(15)*** more than others, and increases the burden of DM on the developing countries.

History of rheumatic heart disease was reported in (19%) of Patients while its prevalence was (16%) in GULF-REGISTRY ***(9)*** and its prevalence was (3.1%) in (AFNET registry) ***(7)*** although the prevalence is high in DEAF REGISTRY, the valvular heart disease reported to be the same in results in (GULF REGISTRY) ***(9)*** and (AFNET registry) ***(7)*** but the difference that in DEAF registry the more valvular heart disease is mainly rheumatic in origin.

when we discuss the patterns of atrial fibrillation on presentation with GULF-REGISTRY and Germany (NET-WORK) of atrial fibrillation we found that our survey is close mainly to GULF-SURVEY in that:- most cases of atrial fibrillation are considered first diagnosed AF 47%, then permanent AF 26%, then paroxysmal AF 19%, and small cases became persistent AF 8% came in the end of the survey, when we compare the survey results with Germany (NET-WORK) of atrial fibrillation ***(7)*** we see that:- the main cases are permanent AF 32.8%, then paroxysmal AF 30.2%, then persistent AF 19.5%, and the cases of first presentation of atrial fibrillation came in the end of the survey 10.8%. That is because most of our cases from emergency room.

About the intervention to the cases of atrial fibrillation we found results in (PREFER in AF) ***(10)*** we see the following difference the majority of our cases are considered to have rate control about (51%) then about (31%) of the cases do pharmacological cardioversion then about (7%) of the cases do electrical cardioversion and finally about (7%) of the cases returned spontaneously to their normal sinus rhythm, we notice that about half of our patient do rate control and that explain most of the cases came to the emergency room after the time when the cardioversion can performed.

According to the recent AF guidelines ***(16)*** and became chronic and nearly one third of them receive pharmacological cardioversion and small numbers of them receive electrical cardioversion because they were hemodynamically unstable, no one of the cases do electro-physiological study and do rhythm control in the follow up, in difference to the study (PREFER in AF)81, accepted number of cases do rhythm control in the follow up (5% of cases do catheter ablation, while about 18,1% do electrical cardioversion in their follow up).

Most of our patients had LVEF with a mean of 38.69 % and here we found some difference from the (EORP-AF) ***(17)*** Pilot General Registry as the patients had LVEF with a mean of 52.3% and that reflects that the heart failure had a large burden on the atrial fibrillation patients in Egypt. The valvular heart disease found in 50% of the patient by echocardiography and these results near the (EORP-AF) Pilot General Registry ***(17)*** as the results of valvular heart disease was 63.5% but when we summarize the rheumatic patients as there was the (mitral valve disease and the prosthetic valve) they

account about 32.6% of the total registry by echocardiography. And the difference between the data collected from the history and from the investigations and that reflects that not all the patients know what the disease they have is.

The large number of patients received pharmacological medications for rate control about 55% of the patients and about 31% of the patients received pharmacological medications for the cardioversion to the sinus rhythm and small number of the patients received electrical cardioversion about 7% when we compare these results with (EORP-AF) ***(17)*** Pilot General Registry we found that about 29.8% of the patients received pharmacological cardioversion and about 20.5% of the patients received electrical cardioversion, amiodarone is the commonest AAD used (26.6), while regarding rate control medications, beta-blockers and digoxin were more often used than non-dihydropyridine calcium-channel blockers.

Drug prescription patterns showed interesting changes over the last decade. In the present survey, amiodarone was the most commonly used AAD (23%), followed by sodium-channel blockers and that is nearly equal to the (EORP-AF) ***(17)*** Pilot General Registry, and similar pattern has been found in the (AFNET registry) ***(7),*** collected at the time of the EuroHeart survey ***(18),*** and is also reflected in the PREFER in AF dataset and different from the last decades in that: In the EuroHeart survey ***(18),*** Class Ic agents were used in 30%, while Class III agents were used in 35%.

The most medication prescribed for the patients as rate control is digitalis 55%, bisoprolol 24.2% and that is different from the recent AF guidelines ***(16)*** as digitalis prescribed as rate control whatever the indications.

OAC was used in 83.6% overall, most often vitamin K antagonists (73%), with novel OAC being still used in a minority (10.6%). however, other antithrombotic (mostly antiplatelet therapy, especially aspirin) were still used in two-third of the patients and the gap between the result and the recent guidelines in the novel anti-coagulant, not the class -1 recommendations in the management of the AF patients where the warfarin still the frequently used OAC.

Limitations:

Large powerful registries require manpower, team work, costly budgets and solid databases. Given above requirements, there were some limitations of this registry.

The DEAF registry is limited by its dependence upon the data obtained from cardiologists in eight cardiac centers in delta of Egypt; AF patients are often looked after by non-cardiologists.

Our registry's sample size was modest which might make it less representative, we were hoping to include many hospitals in our registry; however, we have faced some logistic obstacles. Absence of hospital database systems for patients' admission and follow-up data made it a little difficult for us to collect the data and some cases were missed during follow-up phases.

Conclusion:

DEAF registry had modest sample size, so we are determined and hoping for well-designed and larger AF registry recruiting more hospital and more patients over Delta hospitals and even nationwide for better representation of demographic and clinical characteristics of AF Egyptian patients. Transthoracic echocardiography is recommended in all AF patients to guide management. Antiplatelet monotherapy is not recommended for stroke prevention in AF patients, regardless of stroke risk. In our DEAF registry, we reported demographics, risk factors, co-morbidities, baseline clinical presentation, management and short-term outcomes in 500 patients with atrial fibrillation in the region of delta of Egypt. Also, in our following discussion, we also would try to compare our overall results with the available national, regional and international data and find gap between the results found in the registry in patients management after the publication of the 2016 ESC Guidelines on atrial fibrillation and that is was published in August 2016 ***(16).***

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