

Epidemiological and Clinical Features of Patients with Rheumatic Heart Disease Tripoli Medical Centre Tripoli/Libya 2012 - 2017

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ABSTRACT

Rheumatic heart disease (RHD) remains a major public health problem in developing countries and accounts for a major proportion of all cardiovascular disease in children and young adults in African countries. **Aim:** to study the pattern of valve involvement in RHD and to know the type and prevalence of complications.

Case series study, conducted by reviewing the clinical data of patients with diagnosis of rheumatic heart disease. Information obtained from the records included the age, gender, clinical presentation echocardiographic diagnosis and complications.

A total of 384 medical records were reviewed. There were 91 males and 293 females (ratio 1: 3) and their ages ranged from 20 to 82 (mean 46.7 ± 12) years. Mitral stenosis was the commonest echocardiographic diagnosis present in 210 patients (54.7%). Seventy (18.5%) patients had mixed mitral valve disease, 42 (10.9%) had mixed aortic valve disease; isolated rheumatic mitral valve involvement was more common than isolated rheumatic aortic valve involvement (84.1 % versus 43.7%). Complications of RHD observed in this study included: atrial fibrillation (AF) (24.2%), secondary pulmonary hypertension (PHT) (20.6%), and congestive heart failure (CHF) was seen (8 %) of cases.

The RHD is still an important cause of cardiac morbidity and a large proportion of the patients already had complications at diagnosis. There is a need for multicenter study at national level to discover the real burden of the RHD in our community.

Key words- Valvular; Rheumatic; Heart disease; Complication; Libya.

INTRODUCTION

According to WHO data, rheumatic valvular heart disease (VHD) affects about 15.6 million worldwide with 282000 new cases and 233000 deaths each year¹, and out of 500,000 patients with acute rheumatic fever, 300,000 will develop RHD and 233,000 deaths annually due to acute rheumatic fever (ARF) or RHD.² Nearly 2 million patients with VHD will need repeated admissions and 1 million require surgical treatments globally.³ In developing countries, 62-78 million individuals may have RHD with potential deaths above 1.4 million per year from the disease and its complications.⁴ RHD is well known to be responsible for many cardiac complication like atrial fibrillation (AF), infective endocarditis and carries a high risk during pregnancy.^{5,6} Hence most of the morbidity and mortality due to RHD can be prevented by early diagnosis and management^{7,8}, like use of anticoagulant in rheumatic AF can reduce thromboembolic complications, and percutaneous or surgical interventions can improve symptoms and prevent congestive heart failure.^{9,10} In the Middle East region the prevalence is 5.1 per 1000 in Cairo (Egypt), 2.8 per 1000 in Saudi Arabia, and 3-6 per 1000 in

Tunisia.¹¹ The use of Echocardiography in the clinical field facilitate the diagnosis of VHD particularly the subclinical cases 10 times more compared to that diagnosed by the cardiac examination alone¹² and result in more accurate assessment of prevalence of VHD.¹³

With the use of Echocardiography in the assessment of the patients the burden of RHD was higher than that measured in 2005 as showed by many studies in Drakensberg Declaration.¹⁴ In 2005, during the first All Africa Workshop on the rheumatic fever and RHD near Drakensberg in South Africa¹⁵ efforts from affected nations in Africa had attend to focus on the researches and screening by echocardiography to discover subclinical RHD and enhancing the management of the patients with RHD and to start establishment of national programs to prevent rheumatic fever and RHD in Africa.¹⁴ Unfortunately, there is no data regarding the extent of RHD and its complication in Libya, hoping that this study will give such data needed to describe the pattern of valve involvement in RHD and to know the type and prevalence of complications and to attract more attention about this health problem.



MATERIALS AND METHODS

Case series study was conducted by retrospective analysis of medical records of the patients with valvular heart disease who were followed-up at the Valve Clinic. This clinic which started in 2012, is a specialized clinic where a cardiologist and a cardiac surgeon received patients from Tripoli and outside Tripoli, who had either clinical suspicion of the VHD or with a definite diagnosis of VHD. The Valve Clinic is one of the main clinics in the cardiac department at Tripoli Medical Center (TMC), a tertiary health care center and one of the teaching hospitals in Tripoli and is using the 2012 World Heart Federation criteria for echocardiographic diagnosis of rheumatic disease.¹⁷ Out of 454 patients registered in the valve clinic only 384 patients satisfied the criteria for diagnosis of rheumatic heart disease. All patients included in the analysis had complete history including past history of ARF (based on Jones Criteria).¹⁶ All patients advised for regular follow up at the valve clinic to early pick up of complications. The duration of follow up depend on the diagnosis and severity of the valve lesion according to the ESC and AHA guide lines of valvular heart disease.^{9,18,19}

In every follow up visit all patients undergo physical examination and routine investigations (12 lead electrocardiogram ECG and chest X-ray), and assessed regarding onset of complications like: atrial fibrillation, heart failure, Stroke, recurrent ARF, and infective endocarditis. Data was collected in a predesigned case sheet from the medical records of registered patients in the TMC valve clinic between Jan 2012 to Dec 2017 in addition to the other demographic data. A full Trans-thoracic 2-dimensional echocardiography examination performed by the same operator using Vivid 7 GE machine using all available modalities (M-mode, two-dimensional {2D}, color Doppler, continuous wave CW, pulse wave PW Doppler) and observing the echocardiography protocol based on the recommendation and the guidelines of the American Society of Echocardiography.¹⁸ In addition to transthoracic echocardiography, Trans-esophageal echocardiography (TEE) is done to assess the valve anatomy and severity of the valve lesion when the clinical indications arise and subsequently aid in the management of the cases, ECHO examination done in each visit. The severity of the valve lesions were categorized by using AHA and ESC guidelines for the management of VHD.^{9,19}

The collected data coded and SPSS software version 21 was used for analysis, mean SD, frequency and percentages were used to describe the data, Chi-squared analyses were used to compare complication differences between males and females and between involved valves.

RESULTS

Medical records of 384 patients with rheumatic heart disease were reviewed; there were no reported cases of acute rheumatic fever registered in Tripoli Medical Centre valve clinic since 2003. The ages of patients in this study ranged between 20 to 82 years with mean age 46.7 ± 12 years. Rheumatic fever is most prevalent (almost half 49%) in patients age range between 36 to 50 years, and least prevalent at the extreme ages, 17.3% and 7.3% for patients age range between 20-35 years and patients older than 65 years respectively. Rheumatic fever (RF) affected more female than male patients, 76.3% of cases were reported in female patients with female to male ratio 3:1. There was no specific pattern related to the geographic distribution of the disease where more than half of the cases reside in the capital Tripoli and 44% reside outside the capital Tripoli. More than half of cases 247 patients (64.3%) were referred from cardiac OPD, while the remaining 137 patients

(35.7%) referred from other medical departments (Table 1).

Table 1: Socio-demographic characteristics of patients with rheumatic heart disease (TMC 2012-2017).

Character	Frequency	Percentage
Age		
20-35	66	17.3
36-50	188	48.95
51-65	102	26.7
>65	28	7.3
Sex		
Female	293	76.3
Male	91	23.8
Residence		
Tripoli	215	55.9
Outside Tripoli	169	44.1
Referring from		
Cardiac OPD	247	64.3
Medical department	137	35.7
Other chronic diseases		
Non	310	80.72
HPT	35	9.1
DM	20	5.2
Thyroid dysfunction	11	2.8
Others	8	2.08

The most frequent presenting symptoms were dyspnoea (77.3%) followed by palpitation 2.1%. Cardiomyopathy seen only in (3%) of patients and (92%) of patients have normal left ventricular ejection fraction > than 50%.

Table 2: Clinical features of patient with rheumatic heart disease N=384 (TMC 2012-2017).

Character	Frequency	Percentage
Clinical presentation		
Accidental	63	16.4
Dyspnoea	297	77.3
Palpitation	8	2.1
Chest pain	2	0.5
Syncope	4	1
Dyspnoea& palpitation	7	1.8
Dizziness	3	0.8
No. of valve involved		
1	226	58.8
2	150	39.1
3	7	1.8
4	1	0.3
Ejection fraction		
<40	11	3
40-49	19	5
≥50	354	92

The most common rheumatic valvular lesion was Mitral stenosis seen in 54.7% of patients either as isolated lesion or combined with mitral regurgitation MR. Isolated rheumatic mitral valve involvement was more common than isolated rheumatic aortic valve (84.1% versus 43.7%) (Table 3).



Table 3: Distribution of patient with rheumatic heart disease by severity of valve involved (TMC 2012-2017).

Character	Percentage	
Mitral valve		
MR mild	27	7
MR moderate	21	5.5
MR severe	65	16.9
MS mild	26	6.8
MS moderate	51	13.3
MS severe	63	16.4
MS & MR	70	18.2
No mitral valve involvement	61	15.9
Tricuspid valve		
TR mild	30	7.8
TR moderate	21	5.5
TR severe	14	3.6
TS severe	1	0.3
No tricuspid valve involvement	318	82.8
Aortic valve		
AS mild	10	2.6
AS moderate	9	2.3
AS severe	23	6.0
AR mild	46	12.0
AR moderate	20	5.2
AR severe	18	4.7
AS & AR	42	10.9
No aortic valve involvement	216	56.3
Pulmonary valve		
Severe PS	1	0.3
No pulmonary valve involvement	383	99.7

Mitral valve lesions were associated with the highest percentage of complications. Atrial fibrillation was the only type of arrhythmia detected among the patients and it was the most common complication of rheumatic heart disease seen in 93 patients (24.21%), 76.3% of the cases were females, AF was more frequent in mitral valve lesions 95.3% mainly MS where 74.2% of the cases of MS had AF, followed by pulmonary hypertension (20.57%) 73%. Four of the cases are females also most of the cases had mitral valve lesions 97.4% (Table 4,5),

Congestive heart failure seen in 8% of patients as complications with a female predominantly affected 58.1%, with mitral valve lesions as predominant valve lesions in 77.4% of the cases, and the least complications was embolic stroke seen in (4.4%). The only valvular lesion associated with stroke was mitral valve 100% of the cases and again females were affected more commonly than males 64.7%. There was no reported complication with pulmonary valve (Table 4, 5).

Table 4: Distribution of rheumatic heart disease complications by gender (TMC 2012-2017).

Complications	Gender		P value
	Male No. (%)	Female No. (%)	
Arrhythmia	22(23.7)	71(76.3)	0.670
PHT	21(26.6)	58(73.4)	0.882
Congestive heart failure	13(41.9)	18(58.1)	0.049
Stroke	6(35.3)	11(64.7)	0.393

Table 5: Distribution of rheumatic heart disease complications by valve involved (TMC 2012-2017)

Complication	Valve involved			P value
	Mitral (%)	Aortic (%)	Tricuspid (%)	
Arrhythmia	89 (95.3)	32 (34.4)	25 (26.9)	0.001
PHT	77 (97.4)	23(29.1)	35 (44.3)	0.001
CHF	24 (77.4)	12(38.7)	11 (35.5)	0.302
Stroke	17 (100)	0 (0)	0 (0)	0.064

Fortunately, there were no cases of recurrent ARF or Infective Endocarditis. Only 177 patients maintain regular follow up at the valve clinic with about half dropped out, and from those maintaining follow-up only 13 patients underwent surgical intervention while 30 patients refuse recommended surgical intervention. Frequency of deaths among patients who are still contact with the clinic was 4/177 (2.25%).

DISCUSSION

Over the past 10 years, the number of studies on the burden of rheumatic heart disease in developing countries has substantially increased.²⁰ A large multinational African study concluded that RHD prevails as the most frequent cause of heart failure among children and young adults, and importantly that the 180-day mortality is as high as 17.8%.²¹

In Libya RHD is the commonest cause of valvular heart disease accounting for 76.7% of patients with a nearby numbers taken from neighboring countries.²²

As expected most of these patients were female and this agreed with the fact that most females affected more than males by ARF and RHD²³, this result was similar to that obtained by REMEDY study.²⁴ In this study the age of majority of patient was between (36-50 years (49%)), this result was close to that obtained from other developing countries, India and Nigeria, where the highest percentage was for 3rd and 4th decade^{25,26} unlike that seen in REMEDY study where the mean age was 28 years.²⁴

The most affected valve was mitral valve in 84.1% of cases and only 0.3% was due to pulmonic valve involvement and these results identical to fact said that RHD affect mostly mitral valve and pulmonic valve the least.²⁷ MS is



the commonest rheumatic valvular lesions 210 patients (54.7%), with predominant female gender 175 patients (59.7%) and this result is expected.²⁸ MS was the dominant valve lesion also in REMEDY study.²⁴

In current study 41% of patients had multi-valvular involvement and this finding is similar to that calculated from Nepal.²⁹ Unexpectedly the study demonstrate a higher percentage of patients came with complications 220 patients (57.29%) and that was higher than that noticed in Nigerian savannah where the complication rate was 32%²⁶ and Uganda.³⁰

Study revealed that the burden of the complication due to rheumatic heart disease is in the capital Tripoli, as 55.9% of the total number of the patients presented with complication and this may be related to the weak primary health care services and lack of echocardiography in other institutions.

The common complications were arrhythmia (AF) in 93 patients (24.2%), 76.3% were female and 95.3% mitral valve was affected 49.5% of the patients were between 36-50 years and because there is high incidence of thromboembolic complication in patients with rheumatic heart disease.³¹ All patients included in this study were on oral anti-coagulant as advised by the ESC guidelines in the management of AF.³² Pulmonary hypertension came in the second place as a complication after arrhythmia 20.57%, with 97.4% of the cases mitral valve was the affected valve and that result was higher than result observed from study in Uganda.³⁰ It is well known that development of PHT affects the quality of life and shorten life expectancy.^{33,34} Rheumatic heart disease accounts for about a quarter of all patients with heart failure in endemic countries.³² In this study heart failure was the third frequent complication, more in females, more frequent in mitral valve disease unlike the result obtained from Uganda³⁰ where the common complication was heart failure. Stroke noticed in mitral valve cases and more in female, all the patients on oral anticoagulant as it decrease the recurrent rate of stroke.³⁵ Fortunately, current series had low rate of stroke in spite of large numbers of patients with AF and that was due to the use of oral anticoagulant by the patients and their good adherence to the therapeutic range of international normalized ratio (INR). Fortunately again, there was no recurrent attack of acute rheumatic fever in this review, which was common complication 11% in Uganda, 40% in India³⁶, and like that registered in South Africa by Sliwa K.³⁷ That result might be due to the fact that most of these patients with documented previous rheumatic fever received long acting penicillin which reduced the recurrence of rheumatic fever to less than 20%.³⁸ Also, no cases of Infective Endocarditis was registered and that because the clinic was tightly followed the ESC guideline of Infective Endocarditis.³⁹ In spite of the large percentage of complication among the patients in present study, the deaths among patients still followed in the clinic was low 4/177 (2.25%), and this is lesser than that observed in REMEDY study where it was 11%²⁴, and in that recorded in Ugandan cohort where it was 18%³⁰, the low death rate in the existing study came from the fact that heart failure complicate a relatively small percentage of the cases at presentation.

As only 177 patients maintain regular follow up (46,

09%), the others lost their follow-up most probably due to financial and security purposes because most of the patients who lose the follow up with the clinic were from outside the capital (54.1%).

CONCLUSION

More than one third of the patients with RHD have two valves or more involvement, mitral valve was predominately affected with stenosis more than regurgitation, atrial fibrillation complicate about one quarter of patients at presentation.

RECOMMENDATIONS

More efforts are needed to improve the ability of the junior physician for early detection of patients with RHD before complications appear, also the need of multicenter studies are recommended for more clear view about extent of RHD in Libya.

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