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Research Article

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Pattern of Valvular Heart Disease Valve Clinic Experience, Tripoli Medical Center, Libya (2012 - 2015).

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ABSTRACT

TValvular heart disease (VHD) represents the fourth most common cause of cardiac mortality and morbidity worldwide. It remains a major cause of cardiac morbidity in Libyan patients, mostly from chronic sequels of rheumatic valvular heart disease. The objective of this study is to determine the pattern of valvular heart disease and to fill the knowledge gap of this field in Libya. This is a retrospective case series study conducted by reviewing the medical records of 454 patients attending the Tripoli Medical Center valve clinic (TMC). A predesigned case sheet was used to collect all relevant data and SPSS software was used in analysis. The total number of patients attending the valve clinic from January 2012 to June 2015 were 454 patients. 73% were females and 27% were males. The mean age was 50±17years for males and 47±16 years for females. 45% of patients lived outside the great Tripoli area, 76.7% had rheumatic heart disease, single valve involvement was seen in 65% of the patients most commonly the mitral valve (32% MR and 28.6% MS with different severity). The least affected valve was pulmonic valve in the form of pulmonary stenosis (0.9%). Surgery was advised in186 patients, only 22 patients underwent surgery (12%), 43 patients refused surgical intervention (23%). 74 patients (40%) are still waiting for surgery, 19 patients (10%) were unfit for surgery and 2 patients died. Rheumatic heart disease is still a major medical problem in Libya. Public and patient education is needed with expansion of services to the rural areas and more medical multidisciplinary co-operations.

Keywords - *VHD; RHD; ECHO; PMBV.*

INTRODUCTION

Valvular heart disease (VHD) represents the fourth most common cause for cardiac mortality and morbidity worldwide after ischemic heart disease (IHD), hypertension (HPT), and congestive heart failure (CHF).[1] VHD accounts for 10-30% of all the causes for cardiac surgery.[2] In 1812 William Charles discovered the link between acute rheumatic fever (ARF) and carditis[3], and in 1889 Cheadle described the medical process that lead to carditis.[4] In the current era, rheumatic valvular heart disease remains a common cause for cardiac mortality and morbidity in the developing countries.[5] There is a decline in acute rheumatic fever cases with an increase in the number of patients still suffering from chronic sequels of rheumatic valvular heart disease. In developed countries, the incidence and prevalence of both acute rheumatic fever and chronic rheumatic heart disease has declined since the early 1900s.[6] According to the World Health Organization data, rheumatic valvular heart disease affects about 15.6 million people worldwide with 282000 new cases and 233000 deaths each year related to rheumatic valvular heart disease.[7]

There are nearly 2 million patients with VHD requiring repeated admissions and 1 million requiring surgical interventions globally.[8] The increased use of echocardiography in the developing countries, facilitate the diagnosis of rheumatic valvular heart disease and result in a more accurate assessment of VHD prevalence[9], particularly the cases of subclinical carditis which are diagnosed at a rate of up to 10 times more byechocardiography in comparison with cardiac examination alone.[10] The overall incidence in the developed countries is about 1 case in 100.000[11], but varies from one country to another. For instance, 1 case in 100.000 have been reported in Costa Rica[12] versus 100 cases in 100.000 in Sudan.[11] The prevalence varies from 0.2 per 1000 school children in Cuba to 77.8 per 1000 in Samoa. 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.[13] The pattern of VHD in Libya is unknown. Therefore, the present retrospective analysis aims to shed some light on the pattern of VHD among Libyan patients and to discuss different management lines and outcomes. Such data can be used to plan and improve the medical care of patients with VHD in Libya.

MATERIALS AND METHODS

A retrospective analysis of the medical records of 454 patients with documented VHD was carried out at the Tripoli Medical Center (TMC) clinic. The TMC valve clinic was established in 2012 to focus on the care and management of patient with VHD. The clinic is a high capacity referral place for patients with VHD from the capital Tripoli area and from outside the capital. Data was

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collected in a predesigned data case sheet from the records of patients registered with the TMC valve clinic between January 2012 and June 2015. The main reasons of referral were either clinical suspicion of VHD or definite diagnosis of VHD. All patients included in the analysis had their history and physical examination findings documented in the chart in addition to other demographic data. A full trans-thoracic 2-dimensional echocardiography examination was performed by the same operator using Vivid 7 GE machine using all the available modalities (M-mode, two-dimensional"2D", and Doppler). The echocardiography protocol was based on the recommendations and guidelines of the American Society of Echocardiography.[14] Trans-esophageal echocardiography (TEE) was performed on 11.5% of the patients in addition to transthoracic echocardiography to assess VHD when clinical indications arose. The severity of the valve lesions were categorized by using AHA and ESCguideline.[15,16] The collected data was coded and SPSS software version 16 was used for analysis. The mean, SD, frequency, and percentages were used to describe the data.

RESULTS

From the 454 patients, 331(73) were female and 123(27) were male. The number of patients residing in Tripoli was 252(55) and the remaining, 202 (45) patients were referred from outside Tripoli (Table 1). The age of patients ranged between 18 to 90 years, with a mean age of 47.9±16.5 years. The largest number of patients were aged between 37 and 47 years 139(30.6) patients, followed by 128(28.2) of the patients aged above 58 years, 109(24) patients aged between 48 and 58 years, 59(13) patients aged between 26 and 36 years, and 19(4.2) patients aged less than 25 years (Table 1). The most common clinical presentation in the patients was dyspnea 339(74.7) followed by accidental murmur discovered during the physical examination 78(17.2). Other presenting symptoms and signs included palpitations, chest pain, dizziness and syncope (Table 2). The most common cause of valvular heart disease in the patient sample was rheumatic heart disease 348(76.7), followed by degenerative valvular disease 43(9.5), Myxomatous valvular disease 22 (4.8), and ischemic heart disease 19(4.2) (Figure 1). Other detected causes of valvular heart diseases were ventricular dilatation, traumatic, congenital calcification, aortic dilatation or associated with Ebestian anomaly. Most of the patients had a single valve involvement 295(65), two valves involvement was identified in 152 patients (33.5), and three valves involvement was identified in 7 patients only (1.5). Severe mitral regurgitation was the most common mitral valve lesion seen in this cohort with 95 patients (21) affected, followed by severe mitral stenosis in 59 patients (13). Combined mitral valve lesion was observed in 71 patients (15.6), where mitral regurgitation tended to be more prevalent in males (67) while mitral stenosis tended to be more prevalent in females (84). The most common aortic valve lesion was severe AS in 53 cases (11.6), followed by mild aortic regurgitation in 40 cases (8.8), and combined aortic valve lesions were seen in 39 patients (8.6). Senile degeneration caused 63.1 of all the cases of AS followed by rheumatic heart disease in 33.8% of cases. Rheumatic heart disease was the underlying cause in 85.8% of AR cases, whereas dilatation of the ascending aorta and arch were secondary causes to the remaining 14.3 of AR cases.

All the cases of combined AS and AR were due to rheumatic heart disease. Both AS and AR were more common in female patients (53.8% and 52.4%, respectively). Regarding the tricuspid valve, it is mainly associated with other valve diseases (67% of the cases with mitral valve lesions have TR with variable severity), organic tricuspid regurgitation accounted for 14.7% of all the cases (37 cases of moderate TR and 30 cases of severe TR), rheumatic heart disease caused 95.5% (64/67), 3% caused by Ebestien anomaly (2/67), and only one male patient (1.5) due to traumatic rupture of the tricuspid leaflets post road traffic accident at 31 years of age and from the all organic TR 47 patients were females (70). Isolated tricuspid valve stenosis was very rare as it was observed in only one female patient due to rheumatic heart disease. Pulmonic valve involvement was rarely seen in isolation (4 patients with PS) and the cases observed were all observed in females and were due to rheumatic heart disease with two cases associated with mitral stenosis. During the study period there were 12 pregnant patients with established valvular heart disease, where one patient had congenital bicuspid aortic valve and the remaining cases were due to rheumatic heart disease. During the follow-up period, and in cooperation with the obstetric antenatal clinic, all patients went through pregnancy without major complications and had their babies through normal vaginal delivery. During the follow-up period, this group of patients had grade II dyspnea with mild to moderate pulmonary hypertension which required medical therapy in the form of beta-blockers and diuretics. Four of the pregnant patients underwent surgical repair postpartum, one patient died from infective endocarditic and septicemia, and the remaining patients still follow up at the TMC valve clinic. The majority of this cohort have well persevered left ventricular function and only 52 patients (11.5) have LVEF< 50%. The most common valvular lesion associated with low left ventricular ejection fraction was severe mitral regurgitation (53.8) followed by sever aortic regurgitation (15.4%), and 46% of the patients who had EF < 50% were older than 58 years. Atrial fibrillation (AF) remains the most common arrhythmia seen in patients with valvular heart disease.

AF complicate 61% of the total number of patients with different severity of MS, and all the cases are on oral anticoagulant (Table 3). The main goal of the present study is to monitor the cohort clinically and advice the best management plan for their disease process. Medical therapy and follow up were advised in less than half of the patients 214(46.2). Surgical replacement or repair was advised for 186 patients (41) with valve replacement advised in 152 patients, valve repair advised in 31 patients, and aortic root implantation advised in 3 patients. Females constituted 67.6% of the cases advised for replacement and 56.2% of the cases advised for repair. Patients aged older than 58 years accounted for 35.1% of the cases advised for replacement and 25.6% of the cases advised for replacement were aged between 48-58 years. As for the cases advised for repair, 37.6% of the patients were older than 58 years and 25.5% of them were aged between 48-58 years. Patients who had refused surgical intervention due to various reasons were 43 (9.5), 22 patients (5) were operated at the local

hospital, and 74 patients are still on the waiting list for surgery (40). Percutaneous valvuloplasty was advised for 39 patients (8.6), where 83.8% of them were females, 45.9% of the cases were aged between 37-47 years, and 29.7% of the cases were aged between 48-58 years. There were 15 patients deemed unsuitable surgical candidates due to medical co-morbidities and the potential of the patients for TAVR. These patients were older than 58 years and 60% of them were female. From the total number of patients, 287 (63) continue to regularly follow-up with the clinic, however,78 patients (17.2) have failed to continue with their follow-up mainly because most of them (55) live outside Tripoli. During the follow up period of this study, five patients had died (9%) with 2 patients dying after cardiac surgery; one patient due to septicemia after pre-operative infective endocarditis; one patient due to sickle crisis; and one patient due to acute pulmonary edema (Table 3).

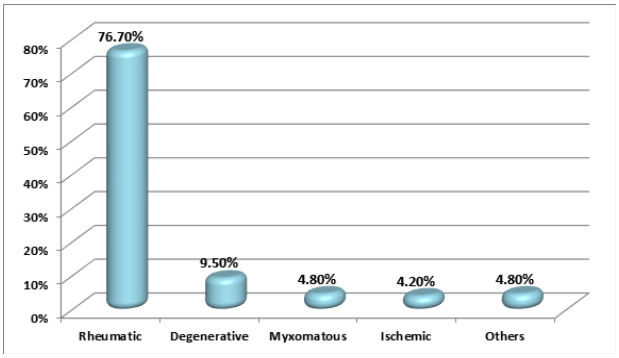

Figure 1: Pattern of valvular heart disease (Valve Clinic, Tripoli Medical Center (2012 - 2015).

Table 1: Demographic profile of patients with VHD (TMC valve clinic 2012-2015).

Character	Frequency	Percentage
Gender		
Male	123	27%
Female	331	73%
Age at diagnosis		
≤ 25 y	19	4.2%
26 – 36 y	59	13.0%
37 – 47 y	139	30.6%
48 – 58 y	109	24.0%
> 58 y	128	28.2%
Place of residence		
Tripoli	252	55%
Outside Tripoli	202	45%

Table 2: Clinical profile of patients with VHD (TMC valve clinic 2012-2015).

Character	Frequency	Percentage
Presentation		
Dyspnea	339	74.7%
Accidental	78	17.2%
Palpitation	22	4.8%
Chest pain	8	1.8%
Syncope	6	1.3%
Dizziness	1	0.2%
Number of valve involved:		
One valve	295	65.0%
Two valves	152	33.5%
Three valves	7	1.5%
Valve involved:		
Isolated mitral	183	40.3%
Isolated aortic	106	23.3%
Isolated tricuspid	2	0.4%
Isolated pulmonary	4	0.8%
More than one	159	35%

Table 3: Complications and outcome of patients with VHD (TMC valve clinic 2012-2015)

Character	Frequency	Percentage
Complication		
None	255	56%
Arrhythmias	129	28.4%
Pulmonary HPT	103	22.6%
Heart failure	27	14.3%
Stroke	2	5.7%
Outcome		
Follow up	213	46.9%
Missed follow up	78	17.2%
Waiting for surgery	74	16.2%
Refusesurgery	43	9.5%
Unfit for surgery	19	4.2%
Surgery done & doing well	22	4.8%
Died	5	1.1%

Table 4: Gender distribution of patients with VHD (TMC valve clinic 2012-2015)

VHD	Gender	
	Male	Female
Mitral regurgitation	70%	30%
Mitral stenosis	15.9%	84.1%
Aortic regurgitation	47.6%	52.4%
Aortic stenosis	47%	53%
Tricuspid regurgitation	28.6%	71.4%
Tricuspid stenosis	0%	100%
Pulmonary stenosis	0%	100%

DISCUSSION

To the knowledge of the investigators, this is the first study of its kind done to explore the pattern of valvular heart disease in Libya and to help understand the various factors involved in the care and management of such patients. It was not unexpected that rheumatic heart disease was the most common underlying etiology of valvular heart disease in this cohort of patients (76.7%). Such a high percentage was similarly seen and reported at atertiary cardiac center in south India (64.3%)[17] and in Nigeria (61.6%).[18] However, in contrast, the most common cause of VHD in developed countries was reported to be degenerative diseases process.[19-21] In the present study, only 45% of patient were from outside the great Tripoli area. Such a low percentage was likely due to the lack of cardiovascular services in rural areas and the socioeconomic circumstances of patients living outside the great Tripoli area. In this study the number of females were more than males and this results from the fact that acute rheumatic fever and RHD affect females more than males.[57] Among the total patients, 30.6% were aged between 37-47 years and 28.2% were older than 58 years. The age distribution in the current study is in accordance with other studies from India and Nigeria where the highest percentage were in their 3rd and 4th decade.[17,18] However, in Europe and the USA most of the patients were in their 7th decade.[19,52,53] Mitral regurgitation was the most common single valve lesion (32%) mainly

due to rheumatic heart disease (64.5%) followed by myxedematous changes (14.6) and ischemic heart disease (13.8%). In an Indian study, 17the predominant isolated valve lesion was MS (rheumatic) lesion, followed by MR (rheumatic then myxedematous), AS (degeneration then bicuspid then minority of the cases were rheumatic) AR (rheumatic then bicuspid valve). In a study conducted by Oslenin Mayo clinic,[50] it was reported that pure MS accounted for 41.9% and all of them were of rheumatic origin, followed by AR (26.8%) with 91.56% of rheumatic origin and 8.4% due to dilatation of ascending aorta. On the other hand, Dare[51] reported that aortic dilatation and/or degenerative changes were the leading cause of AR, and for AS (26.5%) about half of them (48.78%) were due to senile degeneration and 45.12% due to rheumatic causes. All the ischemic causes of valve lesions were MR. In comparison to the developed world, AS and MR were the common isolated valve lesion and mostly due to degeneration (AS) and ischemia (MR).[19-21]

Ischemic mitral regurgitation occurs in approximately 20% to 25% of patients with myocardial infarction even in the era of reperfusion, and these patients have significantly worse outcomes irrespective of the degree or mitral regurgitation.[60] Rheumatic carditis rarely affect the tricuspid valve[58] so only 14% of the organic tricuspid valve lesions were detected in this study. The current report revealed 4 cases of PS; 2 moderate PS and 2 severe PS. All the cases were rheumatic in origin with 2 cases that had both MS and PS. This observation could be an indication that the pathological involvement of the valves in RHD affect the mitral valve the most and the pulmonary valve the least.[49] The management of patients under the current study was based on the ESC guidelines and the AHA/ACC guidelines.[15,16] The focus for intervention was to improve symptoms, prolong survival, and to lower the risk of valve-heart disease related complication such as arrhythmias, heart failure, stroke, and PHT.[15] Furthermore, a risk assessment was included in the decision making for each patient individually based on their age, address, other co-morbidities, risk of intervention, and other possible alternative treatments and the local resources.[22] The number of patients managed medically through the clinic with regular follow-up and periodic assessment was 214, surgical intervention was advised in 186 patients, and 43 patients refused surgery due to various reasons. The main reason of refusal was due to a lack of understanding of short and long term squeals of valvular heart disease and/or the lack of trust in the local surgical expertise. Patients who have undergone surgery so far are 22 patients (12%) and 2 of them have died during or after cardiac surgery (9%). This represents a high mortality rate driven by the low number of patients operated on. Patients who are still on the waiting list for surgery are 74(40%) due to lack of human and technical resources to perform the surgery locally. Percutaneous mitral balloon commissuratomy was advised in 39 patients. This procedure is indicated when the mitral valve area is <1.5 cm 2 and with favorable valve anatomy in the absence of moderate to severe MR.[23,24] The number of severe MS cases in the present study was equal to 66% which was comparable to 76% reported in Turkey[54] but was higher than Europe (34%).[53] An explanation of these results could be due to the fact that most of the patients in the present study are younger than the patients in Europe. In the present study, 15 patients had severe symptomatic AS not fit for surgery who picked up for TAVR[44,45] which is an implantation of Bioprosthetic valve using percutaneous catheter-based intervention, widely used in Europe over 10,000 cases up to now, but the experience and facility for TAVR is deficient locally. As known, there are no clear international guidelines for the management of mixed valve lesions. However, they need to be followed up at more frequent intervals than that recommended for single valve lesions.[25,26]In the management of pregnant patients, the ESC guidelines for management of cardiovascular disease in pregnancy[61]was followed. Results obtained in pregnant patients in the present study were similar to other studies in the developing countries from an ethological point.[27,28] Unlike developed countries, where congenital heart disease is the dominant lesion in pregnant females, with cardiac disease[29,30], 33.3% of the patients had severe MS in the present study similarly to a study done in Africa.[31]

As cardiac surgery during pregnancy has a high risk for both mother and the fetus[32,33], none of these patients underwent any percutaneous or surgical intervention and all the patient were managed clinically with good outcomes. A large number of patients 80% presented with cardiac symptoms to the clinic, and 44.27% had complications. Such a percentage was higher than that reported in a study on the prevalence and pattern of RHD in the Nigerian savannah where the complication rate was 32%,[34] and lower than that reported in Uganda 49%.[35] Arrhythmia (AF) was the commonest complication either as an isolated finding 26.3% or in association with pulmonary hypertension 22.38%, and 9.4% of cases were aortic valve lesion and the remaining were mitral valve. AF which is the most common sustained arrhythmia worldwide and is associated with a high rate of heart failure and stroke.[36,37] All of the patients in the existing study used oral anticoagulants according to the ESC guidelines of management of AF.[38] Pulmonary hypertension, as a result of valvular heart disease, is associated with shortened life expectancy and development of heart failure. In this study, pulmonary hypertension was seen in 26.8% and 88% of the cases were associated with mitral valve lesions. The same results were seen in a study from Uganda.[35] Development of PHT affects the quality of life and shortens life expectancy.[39,40] Heart failure is one of the common manifestations of valvular heart disease seen in 13.4% of patients, which is defined according to the Framingham criteria.[41] All the patients were treated according to the guidelines of ESC and AHH for heart failure.[42,43] Rheumatic heart disease accounts for about a quarter of all patients with heart failure in endemic countries.[59] Stroke is commonly seen in patients with atrial fibrillation (6.9%), and only two patient in this cohort had stroke but was not related to valvular heart

disease. However, all the patients used oral In general, 73.6% of the cases of arrhythmia were females and all of them used oral anticoagulants, 81.4% of the patients with PHT were females. Both of the complications were common in the age between 37-47 years, whereas heart failure was equally present in both sexes. Despite the ease of access to healthcare for patients living in Tripoli compared to those living outside Tripoli, there was no difference in the rate of complications in both groups. No cases of recurrent attack of acute rheumatic fever were registered in this review, although it was a common complication (11%) in Uganda and (40%) in India.[46] As reported in South Africa by Sliwa K[47], this was likely due to the fact that most of the patients with documented previous rheumatic fever received long acting penicillin which reduced the recurrence of rheumatic fever to less than 20%.[48]

CONCLUSION

From this study, which is the first time to be performed in Libya concerning VHD, we can conclude that RHD is still the commonest cause of VHD. The majority of patients were female and middle age. A large number of the patients presented with complications and also there is a large number of patients waiting for cardiac surgery.

RECOMMENDATIONS

There is a need for more human and technical resources in local hospitals and more efforts are needed to educate patients about the long term complications of valvular heart disease. Moreover, there is a need for more attention to the primary health care services from the cardiological point of view.

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