The Turkish registry of heart valve disease

Türkiye kalp kapak hastalıkları kayıt çalışması

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ABSTRACT

Objectives: Valvular heart diseases (VHD) occur frequently in Turkey. However, epidemiological studies of VHD have not been completed until now. The aim of this study is to identify the VHD type, clinical, laboratory characteristics, and treatment methods among VHD patients in Turkey.

Study design: The study was conducted prospectively between June 2009 and June 2011 at 42 centers, and included patients with native VHDs, infective endocarditis, and/or previous valve interventions.

Results: All medical data from 1300 patients were recorded. Mean age was 57±18 years and the female/male ratio was 1.5. VHD was native in 84% of patients, 15% had previous interventions, and 1% had infective endocarditis. Among the native VHDs, mitral regurgitation was the most frequent lesion (43%), followed by multiple VHDs (32%). Degenerative etiology (86%) was more frequent in aortic VHD, and rheumatic origin was the main cause in all VHDs. While the prevalence of aortic stenosis increased with age, mitral stenosis decreased with patient age. The most frequent symptom was shortness of breath (73%). Clinical and echocardiographic examinations (54%) were mostly used as diagnostic techniques for determining treatment course. Percutaneous mitral balloon valvuloplasty (PMBV) was performed in 76% of the patients with mitral stenosis and mechanical prosthetic valve replacement was performed in 74% of the patients with other lesions.

Conclusion: This study showed that the main cause of VHD is rheumatic fever. Mitral regurgitation and multiple valvular lesions are the most frequent VHDs in Turkey. PMBV and mechanical prosthetic valve replacement are the preferred treatment methods for VHD.

ÖZET

Amaç: Ülkemizde kalp kapak hastalıkları (KKH) sık görülmesine karşın, bu konuda herhangi bir epidemiyolojik veri bulunmamaktadır. Bu çalışmada, Türkiye'deki KKH'de klinik, laboratuvar bulguları ve önerilen tedavi yöntemlerinin araştırılması amaçlandı.

Çalışma planı: Çalışma ileriye dönük olarak, 42 merkezde yapıldı. Haziran 2009-Haziran 2011 arasında bu merkezlere başvuran, daha önce KKH'ye yönelik girişimde bulunulmuş olgular, doğal kapak hastalığı ve/veya endokardit tanısı konulan hastalar çalışmaya alındı.

Bulgular: Toplam 1300 hastaya ait veriler kaydedildi. Hastaların yaş ortalaması 57±18 yıl, kadın/erkek oranı 1.5 idi. KKH'nin %84'i doğal kapak, %15'i önceden girişim yapılan ve %1'i de endokarditli olgulardan oluşmaktaydı. En sık görülen doğal KKH mitral yetersizliği (%43) olup bunu çoklu kapak hastalığı (%32) izlemekteydi. Tüm hastalarda romatizmal (%46), aort darlığında ise dejeneratif (%86) etyoloji öne çıkmaktaydı. Yaşla birlikte aort darlığı görülme sıklığının arttığı, mitral darlığının ise azaldığı saptandı. En sık görülen belirti nefes darlığı (%73) idi. Kapak hastalarında tedavi seçimi yapılırken en sık kullanılan yöntemin klinik ve ekokardiyografik değerlendirme (%54) olduğu görüldü. Mitral darlığında perkütan mitral balon valvüloplasti (%76), diğer kapak hastalıklarında ise mekanik protez kapak uygulaması (%74) yeğlenen tedavi yöntemiydi.

Sonuç: Türkiye'de kapak hastalıklarının en sık nedeni romatizmal ateştir. Mitral yetersizliği ve çoklu kapak tutulumu en sık görülen kapak hastalıklarıdır. Perkütan balon valvüloplasti ve kapak değişimi en sık başvurulan tedavi yöntemleridir.

Valvular heart diseases (VHD) are the most common causes of mortality and morbidity after coronary artery disease, hypertension, and heart failure.[1] Heart valve surgery comprises 10-30% of all cardiovascular diseases.[2,3] In the last 60 years, with the eradication of acute rheumatic fever (ARF), degenerative etiologies have replaced rheumatic etiologies.[4,5] Degenerative aortic stenosis (AS) and ischemic mitral regurgitation (MR) are the most common VHD in developed countries.[6] Moderate and severe VHDs occur with a frequency of 2.5 % in an echocardiographic study of 11.911 subjects in the USA, which found that the most common VHD is MR.[7] In a study in Europe (25 countries, 5001 patients), it was reported that the most common VHD is AS.[8] There is limited data on VHD in Turkey. In the "Turkish Adult Coronary Artery Diseases and Risk Factors Study" (2000), it was estimated that 40.000 Turkish patients have VHD.[9] "The Turkish Registry on Heart Valve Diseases" (TRVD) was planned to evaluate disease types, symptoms, etiologies, affected valves, risk factors, laboratory tests, and treatment modalities of VHD.

Abbreviations:

AR   Aortic regurgitation
ARF   Acute rheumatic fever
AS   Aortic stenosis
MR   Mitral regurgitation
MS   Mitral stenosis
NYHA   New York Heart Association
TRVD   The Turkish Registry on
        Heart Valve Diseases
VHD   Valvular heart diseases

PATIENTS AND METHODS

Study population and design

TRVD was carried out between June 2009 and June 2011. Patients with VHD admitted to the cardiology clinics in 33 cities from seven geographical regions in Turkey were included in the study. Informed consent was obtained from all patients, and the study protocol was approved by the ethics committee of Harran University Medical School (Number: 10.06.2009/06-13).

The patients were selected in accordance with the criteria of "The European Heart Survey (EHS) on valvular heart disease".[8] These were:

Age ≥18 years and
- Primary and significant VHD as defined by echocardiography
- AS with a maximal jet velocity ≥2.5 m/sec,
- or mitral stenosis (MS) with a valve area ≤2 cm^2,
- or MR grade ≥2/4,
- or aortic regurgitation (AR) with a grade ≥2/4,
- or diagnosis of suspected or definite endocarditis as assessed by Duke University criteria,
- or patients who had undergone any intervention on a cardiac valve (percutaneous balloon commissurotomy, valve repair, valve replacement).

Stenotic VHD was defined as mild with valve area >1.5 cm^2, moderate with valve area 1-1.5 cm^2, severe with a valve area <1.0 cm^2.[4]

Data collection

Data were collected via the internet (https://ssl.epikriz.com/) from each hospital. The dataset comprised around 200 different parameters such as demographical variables like age, gender, education and the number of children, background, symptoms, co-morbidity risk factors, affected valves, etiologies, electrocardiographic (ECG) and echocardiographic (echo) findings, and suggested treatments. The etiologies of VHD were classified according to the history, clinical and echocardiographic findings. New York Heart Association (NYHA) criteria were applied in order to assess functional capacity.[10]

Statistical analysis

Statistical analysis was carried out using SPSS software (version 11.5, SPSS Inc., Chicago, Illinois, USA). Results were presented as mean ± standard de-

Table 1. Reasons for patient visits to cardiology centers

	Native valve disease (84%) n (%)	Previously intervened (15%) n (%)	Endocarditis (1%) n (%)
First application	534 (49)	54 (27)	9 (100)
Routine follow-up	414 (38)	114 (57)	0
Worsening clinical condition	142 (13)	33 (16)	0

viation or numbers and percentages. Distribution of parametric variables was evaluated with a one-sample Kolmogorov-Smirnov test. For continuous variables, comparisons among the groups were made using the analysis of variance (ANOVA) test. Categorical variables were analyzed using the chi-square test. Two-sided *p* values of less than 0.05 were accepted as significant.

RESULTS

Patients

The study was carried out at 42 centers (4 private, 6 public, 32 university hospitals) by 50 researchers seeing a total of 1300 patients (mean age was 57±18 years, range: 19-101 years, 60% women). Nearly half of the patients were primary school graduates and only 8% of the patients were university graduates. The patients were divided into three groups: Native VHD (Group I, n=1090), previous intervention for VHD (Group II, n=201), and infective endocarditis (Group III, n=9). Native VHD patients were enrolled in the study at the first admittance, whereas patients who had undergone previous interventions were enrolled in the study during the follow-up period (Table 1). All of the patients with endocarditis were enrolled in the study at first diagnosis.

The most frequent native VHD was MR (43%) followed by multiple VHD (32%). Of the multiple VHD cases, 65% were double, 32% triple, and 3% involved quadruple valve disease. Most cases of MR were 2nd and 3rd degree and most cases of AR were 2nd degree. The majority of AS and MS patients had moderate stenosis (Fig. 1). 74% (n=149) of the previ-

Table 2. Type of native and previously intervened valvular heart disease

	n	%
Native valve diseases		
Aortic stenosis	66	6
Aortic regurgitation	45	4
Mitral regurgitation	466	43
Mitral stenosis	164	15
Multiple valve disease	349	32
Patients with previously intervened		
Prosthetic valve replacement	149	74
Mitral prosthesis	86	
Aortic prosthesis	38	
Aortic + mitral prosthesis	22	
Aortic + mitral + tricuspid prosthesis	2	
Tricuspid prosthesis	1	
Valvuloplasty or repair	40	20
Mitral valvuloplasty	17	
Mitral repair	14	
Mitral comissurotomy+mitral valvuloplasty	7	
Mitral repair + tricuspid plasty	1	
Prosthesis + repair	12	6
Mitral repair + AVR	1	
AVR + MVR + tricuspid plasty	3	
MVR + tricuspid plasty	7	
MVR + mitral balon valvuloplasty	1	

AVR: Aortic valve replacement; MVR: Mitral valve replacement.

ous interventions were prosthetic valve replacement, and 90% (n=134) of these were mechanical prosthesis (Table 2). Tricuspid regurgitation accompanied mul-
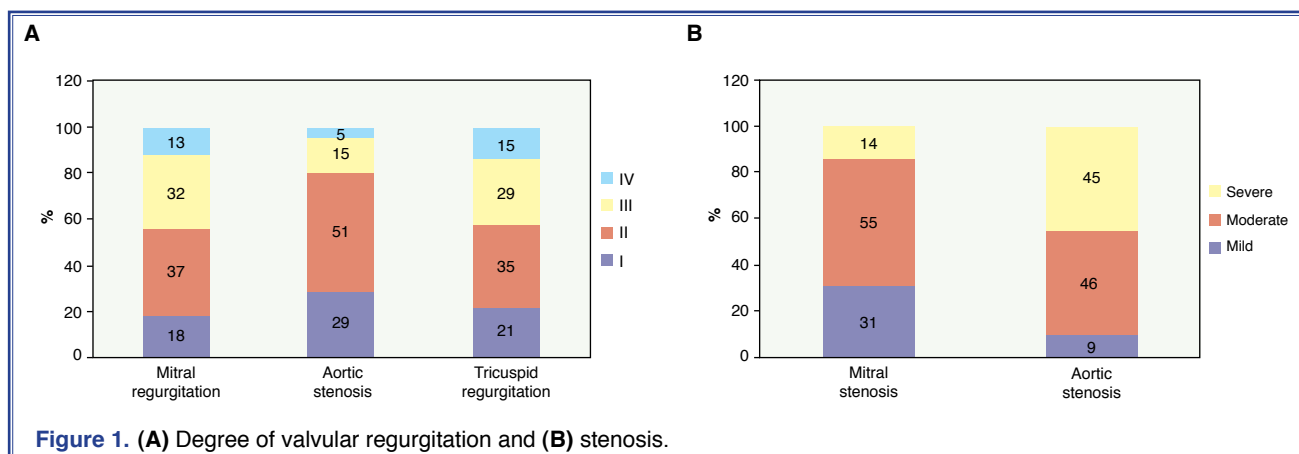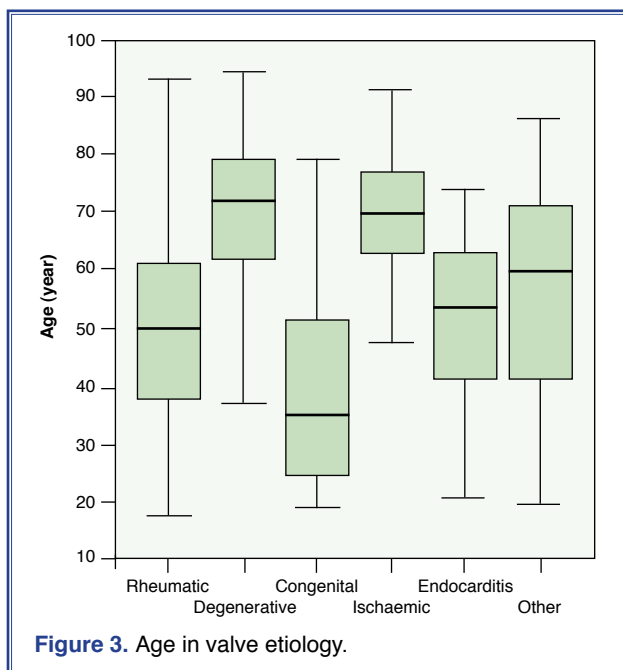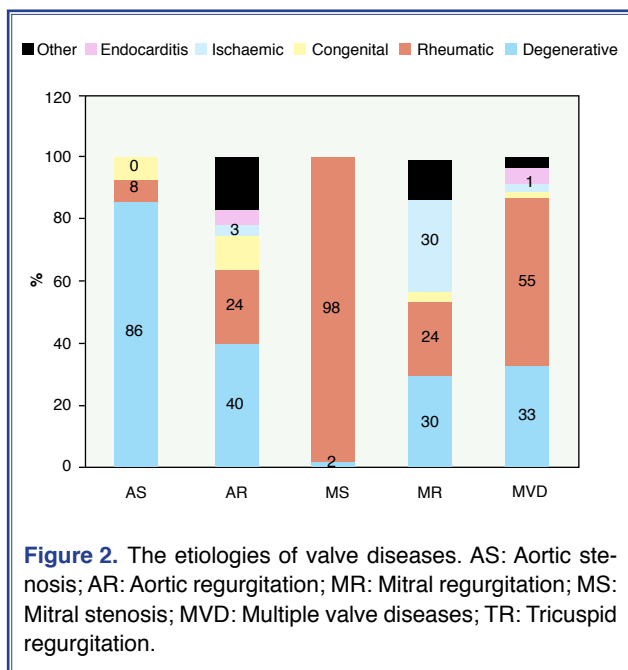

Figure 1. (A) Degree of valvular regurgitation and **(B)** stenosis.

Table 3. The clinical and laboratory characteristics of the patients

	All cases (n=1300)	AS (n=66)	AR (n=45)	MS (n=164)	MR (n=466)	MVD (n=349)	p
Female (%)	60	54	71	70	61	60	0.526
Age (years)	57±18	70±16*	53±22	48±13	62±16	60±18	**<0.001**
Application symptoms (%)							
Dyspnea	73	71	66	91	80	77	0.053
Angina	20	24	27	18	25	18	0.221
Palpitation	48	32	47	65†	48	47	**0.004**
Syncope	4	15	6	4	3	5	0.225
Etiologies (%)							
Degenerative	29	86‡	40	2	30	33	**<0.001**
Rheumatic	46	8	24	98§	24	55	**<0.001**
Congenital	1.9	6	11	0	3	2	0.472
Endocarditis	1.2	0	3	0	1	1	0.563
Ischaemic	11	0	5	0	30¶	6	**<0.001**
Other	11	0	18	0	11	3	**<0.001**
Functional capacity (%)							
NHYA Class I	21	28	24	11	19	23	>0.05
NHYA Class II	43	38	55	42	45	42	>0.05
NHYA Class III	32	34	21	43	31	28	>0.05
NHYA Class IV	4	0	0	4	5	6	>0.05
Comorbide risk factors (%)							
Hypertension	49	60**	44	35	46	50	**0.001**
ARF	28	2	3	24	22	25††	**0.003**
Hyperlipidemia	21	2	10	11	23	23	0.346
DM	10	16	5	4	11	13	0.139
Smoking	7	1	3	3	9	6	0.029
CAD	8	2	5	1	11‡‡	8	0.012
TR (%)	26	2	6	15	32	40	**<0.001**
AF (%)	28	15	8	38	30	31	0.595
LVEF (%)	54±12	56±8	56±9	62±5	49±14¶¶	53±11	**<0.001**
LVEDD (mm)	52±8	49±5	54±10***	47±4	54±8	52±7	**<0.001**
LVESD (mm)	36±9	32±6†††	38±8	30±4	39±10	36±8	**<0.001**

P was calculated using chi-square-test for categorical variables and ANOVA test for continuous variables in patients single and multiple valve diseases. ARF: Acute rheumatic fever; AF: Atrial fibrillation; AS: Aortic stenosis; AR: Aortic regurgitation; CAD: Coronary artery disease; DM: Diabetes mellitus; ECG: Electrocardiogram; LVEDD: Left ventricular end-diastolic diameter; LVEF: Left ventricular ejection fraction; LVESD: Left ventricular end-systolic diameter; MR: Mitral regurgitation; MS: Mitral stenosis; MVD: Multiple valvular disease; NYHA: New York Heart Association; RF: Risk factors; TR: Tricuspid regurgitation.

* P value 0.008 between patients with AS and MR, 0.001 patients with AS and MVD, <0.001 patients with AS and AR, and MS; † P value <0.001 between patients with MS and others; ‡ P value <0.001 between patients with AS and others; § P value <0.001 between patients with MS and others; ¶ P value <0.001 between patients with MR and others; ** P value 0.006 between patients with AS and MR, 0.027 patients with AS and AR, and MS; †† P value <0.001 between patients with MVD and AR, and AS; §§ P value <0.001 between patients with MVD and others; ¶¶ P value 0.001 between patients with MR and AS, 0.004 patients with MR and AR, <0.001 patients with MR and MS, and MVD; *** P value 0.007 between patients with AR and AS, <0.001 patients with AR and MS, 0.010 patients with AS and MVD; ††† P value <0.001 between patients with AS and MR, 0.007 patients with AS and AR, 0.018 patients with AS and MVD.

Figure 2. The etiologies of valve diseases. AS: Aortic stenosis; AR: Aortic regurgitation; MR: Mitral regurgitation; MS: Mitral stenosis; MVD: Multiple valve diseases; TR: Tricuspid regurgitation.
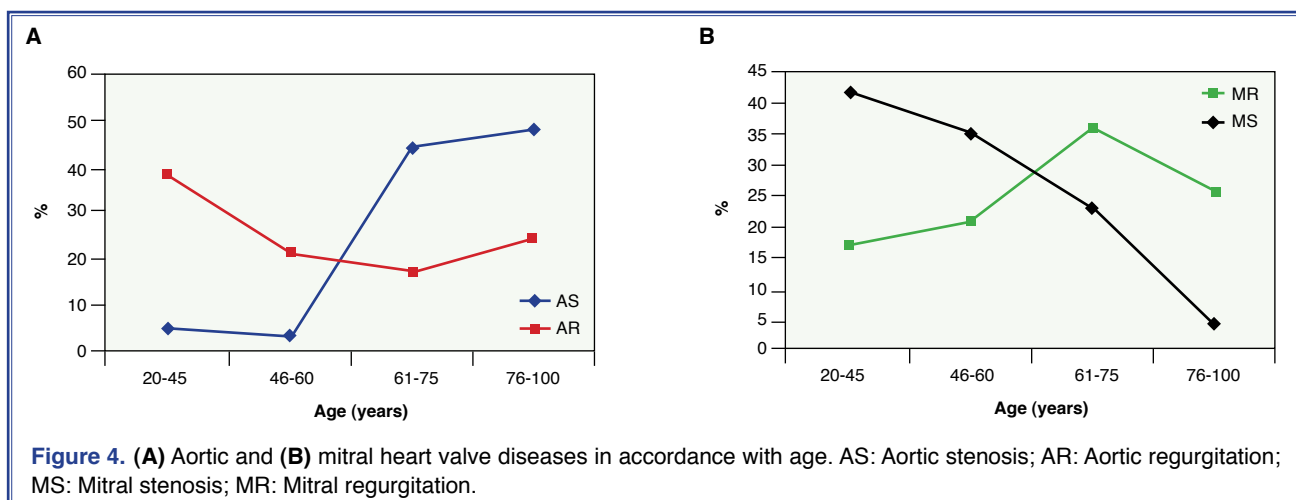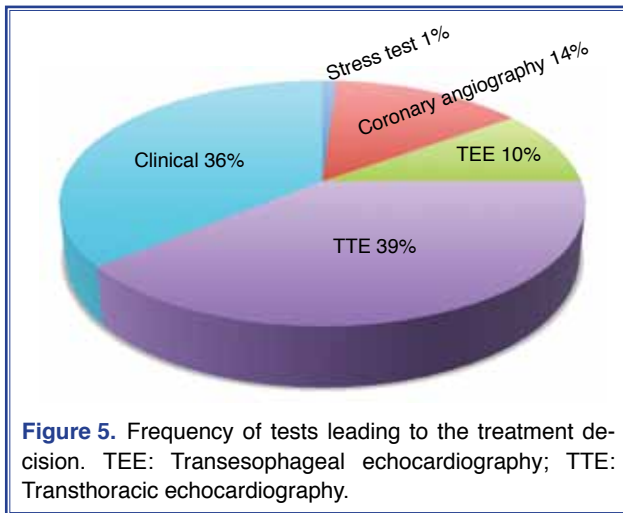

Figure 3. Age in valve etiology.

tiple VHD (40%) and MR (32%).

The most common cause of MS and multiple VHD is rheumatic etiology, whereas aortic VHD is primarily degenerative, and MR is degenerative and ischemic (Table 3, Fig. 2). Mean age was lower in patients with congenital valve diseases and endocarditis compared with other groups (all p<0.05). Age was similar in patients with degenerative and ischemic VHD (p=0.343), and increased in the other VHD etiologies (Fig. 3). In addition, AS was 90% congenital in subjects <40 years oldbut 100% degenerative among subjects ≥70 years of age. While AS increased with age, MS decreased (Fig. 4).

The most important symptom was dyspnea (73%). Syncope was common in AS and palpitation was frequent in MS. Functional capacity was 43% in NYHA Class I, 38% in Class II, 15% in Class III, and 3% in Class IV patients with previous interventions. Of patients with native VHD, 21% were in Class I, 43% in Class II, 32% in Class III, and 4% had Class IV functional capacity.

Hypertension was the most frequent accompanying disease, followed by prior history of ARF. Hypertension was less frequent in MS compared to other VHDs, whereas history of ARF was more frequent

Figure 4. (A) Aortic and **(B)** mitral heart valve diseases in accordance with age. AS: Aortic stenosis; AR: Aortic regurgitation; MS: Mitral stenosis; MR: Mitral regurgitation.

Figure 5. Frequency of tests leading to the treatment decision. TEE: Transesophageal echocardiography; TTE: Transthoracic echocardiography.

among patients with multiple VHD or MS (Table 3).

Atrial fibrillation was present in 38% of patients with MS. Left ventricular ejection fraction was decreased in MR cases (ANOVA p<0.001). Left ventricular end-systolic and end-diastolic diameters were increased in patients with AR and MR (ANOVA p<0.001, Table 3).

It was found that clinical and the echo assessments were helpful in deciding treatment and that 14% of patients had catheterization and coronary angiography. Stress test was performed in only 1% of patients (Fig. 5).
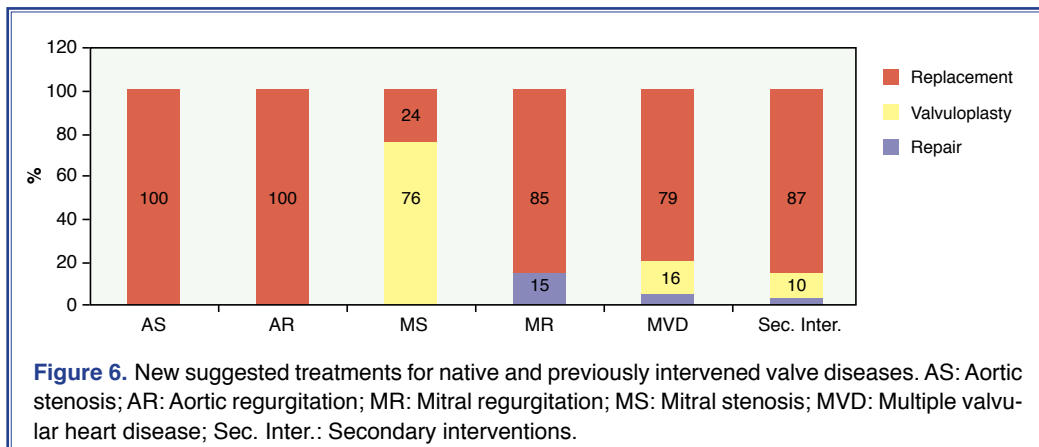
Treatment modalities

Interventional treatment was suggested for 15% of the subjects who had previously undergone interventions and for 26% of the patients with native VHD. While percutaneous balloon valvuloplasty (PBV) was

preferred in MS, prosthetic valve replacement was selected in other VHDs (Fig. 6). Bioprosthesis was applied in 10% of patients with prosthetic valve replacement. Despite the increased mean age of the patients with bioprosthesis relative to those with mechanical prosthesis, there was no significant difference between them (64±13 years *vs.* 54±15 years, p=0.076). 77% of bioprosthetic valve replacements were in the aortic position. 85% of patients who had prosthetic valve replacement were prescribed warfarin, and most of these patients (75%) were seen regularly during follow up care.

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DISCUSSION
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This study found that VHD was more common in patients with only primary school education, frequent among women, and that the most common cause of VHD was ARF. Dyspnea was the most common symptom, and the most frequent valve diseases were MR and multiple VHD. PBV was the most common treatment modality in MS and mechanic prosthetic valve replacement was the most common treatment modality in other VHDs.

Our study indicated that the most frequent VHDs were MR (43%) and multiple VHD (32%), and the most frequent etiologies were ARF (46%) and degenerative causes (29%). Ischemic etiology was more frequent in MR than among other VHDs. The EHS valve study is the most comprehensive epidemiologic work evaluating the etiology of VHD, tests, treatment, and results. The EHS study demonstrated that the most frequent VHDs were degenerative AS (33.9%) and MR (24.8%).[8] The findings of the present study were compatible with the previous surveys in that AS

Figure 6. New suggested treatments for native and previously intervened valve diseases. AS: Aortic stenosis; AR: Aortic regurgitation; MR: Mitral regurgitation; MS: Mitral stenosis; MVD: Multiple valvular heart disease; Sec. Inter.: Secondary interventions.

is congenital individuals under 40 years of age, and degenerative in those more than 70 yeas old.[5-7]

MS occurred two-fold more frequently in women than in men, and its most common cause was ARF. [11] It was reported in the EHS study that ARF was the cause of MS in 85.4% of patients, and that 81% of these patients were women.[8] The present survey revealed that ARF was accounts for nearly all cases of MS (98%) and that 70% of these patients were women. The frequency of MS is 0.1% in USA, and 9% in Europe.[7,8] We found an incidence of 15% in Turkey. This indicates that MS is more common in Turkey than in the USA and Europe.

Rheumatic heart diseases, especially common among the poor and in densely populated areas, are less common in countries where precautions are taken against rheumatic fever.[1,12-14] Despite our major advances in medical technology and understanding, rheumatic fever remains a serious public health problem throughout the world. In a study conducted between 1980-2009, it was found that 1115 Turkish children had ARF, indicating that the frequency of this disease is higher in Turkey compared to developing countries.[15] Our study corroborates the finding that ARF is the primary etiology of VHD in adults.

While some surveys indicate that the frequency of VHD is similar in both genders, others show that MR and AR are more common among men (60-75%). [6,16,17] However, there is a higher prevalence of aortic valve stenosis in men than in women, whereas rheumatic heart disease is more frequent in women compared to men.[7,12,18,19] Our findings are compatible with the latter (60% women).

In the present registry, 64% of patients had NYHA Class I-II symptoms indicating relatively early diagnosis. However, in the EHS study 29.5% of the patients had NYHA Class II and 43.1% had Class III symptoms.[8] The relatively high rate of the Class I symptoms among patients who had previous interventions suggests that treatment had a positive effect on functional capacity.

It is indicated in the valve studies carried out in Europe and USA that the valve disease frequency increases with age.[6-8] Our study also shows that while AS incidence increases with age, MS decreases and that there are no important differences among the other VHD regarding age.

EHS indicates that smoking (38.7%), hypertension (49.1%), diabetes mellitus (15.3%), hyperlipidemia (35.5%), and family history (25.7%) frequently accompany VHD.[8] Our survey indicates that, unlike the EHS study, hypertension, rheumatic fever history, and diabetes mellitus are occur frequently in individuals with VHD, but hyperlipidemia and smoking are less frequently associated with VHD.

Coronary angiography is recommended in diagnostic work-up if there is a risk of coronary artery disease in patients with symptomatic and significant VHD.[4,11] The EHS study reported the use of coronary angiography in 43% of patients, catheterization in 31.1%, and stress tests in 7.9%. These interventions were less commonly used in our trial. Our study group had a lower mean age, a smaller number of cases with severe VHD (<50% *vs.* 66.7%), and fewer cases with previous intervention (15% *vs.* 28%) compared to the EHS study, potentially contributing to the differences in disease incidence between the two studies.

Age has been reported as the most important factor in prosthetic valve implantation, and bioprosthetic valve replacement was preferred in AS patients more than 65 years old.[8,20,21] Mean age was greater among cases with bioprosthetic valve replacement compared to cases with mechanical valve replacement. Bioprosthetic valve replacement was preferred in the treatment of AS in our study group, which is similar to previously published surveys. We speculate that this difference is not statistically significant due to the relatively low number of patients with bioprosthesis in our study group.

In the EHS study, PBV was applied in 33.9% of MS cases.[8] The lower rate of PBV in the EHS study might be attributed to old age, calcification, and deformation in the valve.[5,6,8] In addition, the EHS study indicated treatment of MR by surgical repair (46.5%), bioprosthetic valve replacement in elderly patients with AS, and mechanical valve replacement in other VHDs.[8] Our study determined that PBV is used in 10% of patients who had previous interventions and in 76% of MS patients. The reason for the difference between our finding (76%) and the EHS study finding (33.9%) may be the increased incidence of rheumatic fever as the origin of VHD, the relatively young age of our MS study group, valve structure, and the individual selection of doctors or patients in our dataset. It has been previously reported that PBV is frequently

preferred in treatment of rheumatic VHD,[22] confirming our findings. Our survey indicates that valve repair is suggested for treatment of MR, which occurs with an incidence of 15%, much lower than reported by the EHS study. The difference might be due to a common degenerative origin of MR (61.3%), which is suitable for repair.

Limitations of the study

The main limitation of this study was the lack of follow-up data. In addition, some of the cases may be missing from the registry due to individual physician's personal preferrences.

Conclusions

The most frequent cause of valve diseases in Turkey is ARF. MR and multiple VHD are the most common forms of valve diseases. PBV and valve replacement are frequently suggested treatments in MS and in other VHDs. The effective primary prevention of rheumatic fever and increased awareness among the public would significantly decrease the burden of VHD in our country.

Acknowledgements

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Appendix. Participating investigators with numbers of patients included per centers (by alphabetical order):

	Author	Affiliation	City	Number
1.	Abdullah Doğan, M.D.	Süleyman Demirel University Medical Faculty	Isparta	2
2.	Ahmet Akçay, M.D.	Sutçu İmam University Medical Faculty	Kahramanmaraş	10
3.	Alper Aydın, M.D.	Maltepe University Medical Faculty	İstanbul	2
4.	Alper Onbaşılı, M.D.	Adnan Menderes University	Aydın	4
5.	Ayca Boyacı, M.D.	Ankara Yüksek İhtisas Training and Research Hospital	Ankara	24
6.	Aytül Belgi, M.D.	Akdeniz University Medical Faculty	Antalya	11
7.	Çağlar Emre Çağlıyan, M.D.	Osmaniye State Hospital	Osmaniye	1
8.	Dilek Çiçek Yılmaz, M.D.	Mersin University Medical Faculty	Mersin	2
9.	Durmuş Yıldıray Şahin , M.D.	Çukurova University Medical Faculty	Adana	77
10.	Eftal Murat Bakırcı, M.D.	Atatürk University Medical Faculty	Erzurum	15
11.	Elif Leyla Sade, M.D.	Başkent University Medical Faculty	Ankara	32
12.	Enbiya Aksakal, M.D.	Atatürk University Medical Faculty	Erzurum	59
13.	Ersel Onrat, M.D.	Kocatepe University Medical Faculty	Afyon	6
14.	Fuat Gündoğdu, M.D.	Atatürk University Medical Faculty	Erzurum	2
15.	Gülümser Heper, M.D.	İzzet Baysal University Medical Faculty	Bolu	1
16.	Hakan Akıllı, M.D.	Selçuk University Meram Medical Faculty	Konya	16
17.	Hakan Özhan, M.D.	Düzce University Medical Faculty	Düzce	1
18.	Hamit Çelik, M.D.	18 Mart University Medical Faculty	Çanakkale	12
19.	Haşim Mutlu, M.D.	İstanbul University Cerrahpaşa Medical Faculty	İstanbul	30
20.	Hikmet Hamur, M.D.	Atatürk University Medical Faculty	Erzurum	2
21.	Hüsnü Değirmenci, M.D.	Atatürk University Medical Faculty	Erzurum	4
22.	İbrahim Başarıcı, M.D.	Akdeniz University Medical Faculty	Antalya	33
23.	Jülide Yağmur, M.D.	İnönü University Medical Faculty	Malatya	60
24.	Mehmet Birhan Yılmaz, M.D.	Cumhuriyet University Medical Faculty	Sivas	6
25.	Mehmet Bostan, M.D.	Rize Araştırma Hospital	Rize	24
26.	Mehmet Kaya, M.D.	Erciyes University Medical Faculty	Kayseri	41
27.	Merih Kutlu, M.D.	Karadeniz Teknik University Medical Faculty	Trabzon	45
28.	Meryem Aktoz, M.D.	Trakya University Medical Faculty	Edirne	18
29.	Murat Yüce, M.D.	Gaziantep University Medical Faculty	Gaziantep	27
30.	Mustafa Aydın, M.D.	Bulent Ecevit University Faculty of Medicine	Zonguldak	57
31.	Mustafa Tuncer, M.D.	Yüzüncü Yıl University Medical Faculty	Van	56
32.	Nezire Güllü, M.D.	Kızılay Hospital	Konya	14
33.	Nilüfer Ekşi Duran, M.D.	Kartal Koşuyolu Training and Research Hospital	İstanbul	7
34.	Oktay Musayev, M.D.	Ege University Medical Faculty	İzmir	40
35.	Ömer Şen, M.D.	Çukurova University Medical Faculty	Adana	83
36.	Ömür Kuru, M.D.	ERPA Health Center	Denizli	2
37.	Öykü Gülmez, M.D.	Başkent University Medical Faculty	İstanbul	58
38.	Özgür Ekiz, M.D.	Milas İzan Health Center	Muğla	40
39.	Ramazan Akdemir, M.D.	Dışkapı State Hospital	Ankara	13
40.	Ramazan Topsakal, M.D.	Erciyes University Medical Faculty	Kayseri	35
41.	Recep Demirbağ, M.D.	Harran University Medical Faculty	Şanlıurfa	111
42.	Savaş Çelebi, M.D.	Tokat State Hospital	Tokat	5
43.	Serkan Yüksel, M.D.	19 Mayıs University Medical Faculty	Samsun	17

44.	Sibel Çatırlı Enar, M.D.	Türkiye Hospital	İstanbul	38
45.	Talant Barteliev, M.D.	Konukoğlu Hospital	Gaziantep	9
46.	Tayfun Şahin, M.D.	Kocaeli University Medical Faculty	Kocaeli	53
47.	Yüksel Çavuşoğlu, M.D.	Osmangazi University Medical Faculty	Eskişehir	40
48.	Zehra Gölbaşı, M.D.	Ankara Yüksek İhtisas Training and Research Hospital	Ankara	13
49.	Zekeriya Kaya, M.D.	Şanlıurfa Training and Research Hospital	Şanlıurfa	1
50.	Zuhal Arıtürk, M.D.	Dicle University Medical Faculty	Diyarbakır	44