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Registry of aortic valve stenosis patients in delta region in Egypt

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Abstract
Background: The most widespread valvular heart disease in industrialised nations is aortic stenosis (AS), and its rate rises with age. In relation to the present causes, the purpose of this paper was to characterise the clinical features of AS patients in the Delta area of Egypt, diagnostic and treatment strategies to improve the care of those patients.
Methods: This prospective, observational, multicenter registry research involved 700 patients with prosthetic aortic valves and clinical criteria for mild, moderate, and severe AS. Aortic-valve gradients of less than 25 mmHg were considered mild, 25-40 mmHg were judged moderate, and greater than 1 cm2 was deemed severe based on European Society of Cardiology (ESC) standards.
Results: Regarding age 43% were males and 57% were females, the severity 12% moderate, and severe in 18%, 4% participants had prosthetic valve. Echocardiography showed that 41% of patients had left ventricular hypertrophy. The ejection fraction (EF) ranged from 36 to 70%, for Electrocardiogram, 68% had sinus rhythm, 18% had Atrial fibrillation, 10% had left Bundle branch block (BBB), and 4% had pathological Q wave, type of treatment was medical in 80% participants, and surgical in 13%, and Transcatheter aortic valve replacement (TAVI) in 1%, 2% participants refused surgery and 4% were medically non-fit for surgery.
Conclusions: No pharmaceutical treatment is presently effective in minimising the development of AS, and patient-education efforts will see a spike in the rate of AS in the population who are 50 years old and older, in both sexes, TAVI and Screening programs should be initiated among AS patients.

Keywords: Aortic valve stenosis, delta region, Egypt

Introduction
Untreated individuals with aortic stenosis (AS) have a high mortality rate (about 50% in the first two years after symptoms arise) due to the disease's insidious nature, which has a long incubation phase followed by fast development adhering to the onset of symptoms. In individuals with AS, surgical aortic valve replacement improves survival and lessens symptoms, and when major concomitant diseases do not exist, the surgery has a low operative mortality rate [1].
Due to old age, left ventricular dysfunction, or the presence of several concomitant illnesses, at least 30% of patients with severe symptomatic AS do not have surgery to replace the aortic valve in clinical practise. An efficient option for these individuals, who are at high surgical risk, may be a less intrusive technique [2].
In industrialised nations, AS is the most prominent valvular heart disease, with a rate that rises with age in the general population; at 85 years old, the probability of severe AS is 8.1% [3].
The prevailing indication for aortic-valve replacement (AVR) in symptomatic patients with severe AS is based on retrospective studies and the poor prediction noted in registries conducted in younger patients receiving medical treatment alone. However, studies analysing the natural history of the disorder include no or very few octogenarians [4].
During the asymptomatic phase, survival is high, but within a few years after the start of symptoms, death is greater than 90% [5].

The goal of this study was to characterise the clinical characteristics of AS patients in Egypt's Delta area with respect to the present causes, diagnostic and treatment strategies to improve the care of those patients.

Patients and Methods

This prospective, observational, multicenter investigation included 700 patients with prosthetic aortic valves with clinical criteria for mild, moderate, and severe AS as defined by the ESC. between July 1, 2021, and June 30, 2022.

After receiving clearance from Tanta University Hospitals' Ethical Committee, the study was carried out. The patients provided signed consent after being fully briefed.

Failure for providing at least two phone numbers for follow-up and non-cardiac illness with a life expectancy of more than six months were the reasons for exclusion.

All patients had a thorough history taking, thorough clinical examination, and regular clinic follow-up visits every three to six months, echocardiographic findings (severity of AS by measuring peak, mean PG and trans-valvular velocity, morphology of aortic valve, ejection fraction, other valvular lesions).

The kind of treatment that was set to begin at the time of inclusion, any justifications for not planning an AVR procedure, and the logistic use of the Euro SCORE (European System for Cardiac surgical Risk Evaluation) to determine the surgical risk in severe patients were also noted.

The European Society of Cardiology (ESC) recommended treating AS as mild if the mean aortic-valve gradient was less than 25 mmHg, moderate if the mean aortic-valve gradient was between 25 and 40 mmHg, and severe if the mean aortic-valve gradient was greater than 40 mmHg or the aortic-valve area was greater than 1 cm 2.

Statistical analysis

Mean and standard deviation (SD) were utilised to present statistical data. Frequency and percentages (%) were used to illustrate the qualitative features.

Results

In our study, the severity of the AS was mild in 406 (58%) participants, moderate in 154 (22%) participants, and severe in 112 (16%) participants. 28 (4%) participants had prosthetic valve. Regarding the rhythm in the study participants, 564 (81%) had sinus rhythm and 136 (19%) had AF. Regarding the pathological ECG findings in the study participants, 580 (83%) had left BBB and 120 (17%) had pathological Q wave. Echo showed that 287 (41%) patients had left ventricular hypertrophy. The mean EF was 54.06±7.48%. Table 1

Table 1: Patient characteristics, severity of aortic stenosis, ECG, Echo findings and management strategy in the study participants

Parameters			Study participants (n =700)
Age (years)			55.94±15.33
Sex	Male		301 (43%)
	Female		399 (57%)
HTN			162 (23%)
DM			287 (41%)
Smoking			181 (26%)
CKD			98 (14%)
Dyslipidemia			217 (31%)
Etiology	Degenerative		560 (80%)
	Rheumatic		98 (14%)
	Congenital bicuspid		38 (5.5%)
	Congenital membranous		4 (0.5%)
Severity	Mild		462 (66%)
	Moderate		84 (12%)
	Severe		126 (18%)
	Prosthetic valve		28 (4%)
Rhythm	Sinus rhythm		564 (81%)
	AF		136 (19%)
Pathological ECG findings	Left BBB		70 (10%)
	Pathological Q wave		28 (4%)
	Normal		602 (86%)
Other valvular lesions	Mitral regurgitation		175 (25%)
	Aortic regurgitation		133 (19%)
	Tricuspid regurgitation		98 (14%)
	Mitral stenosis		70 (10%)
	None		224 (32%)
LVH	Present		287 (41%)
EF (%)			54.06±7.48
Management strategies			
Severity	Mild cases	Conservative	490 (70%)
	Moderate cases	Conservative	70 (10%)
		Surgical	14 (2%)
	Severe cases	Surgical	77 (11%)
		TAVI	7 (1%)
	Refused surgery	Conservative	14 (2%)
	Non-fit for surgery	Conservative	28 (4%)

Data are displayed as the mean, standard deviation, or frequency (%), HTN: hypertension, Chronic kidney disease is sometimes referred to as CKD. Electrocardiogram, or ECG Atrial fibrillation, bundle branch block, left ventricular hypertrophy, ejection fraction, and transcatheter aortic valve implantation are all abbreviations used in medical terminology.

Participants in this trial with mild to severe stenosis of the aorta, angina was present in 99 (47%) participants, HF was present in 50 (24%) participants, and syncope was in 88 (42%) participants. Table 2

Table 2: Clinical presentation in symptomatic participants with moderate & severe aortic stenosis

	Study participants (n =210)
Angina	99 (47%)
HF	50 (24%)
Syncope	88 (42%)

Data are presented as frequency (%), HF: Failure of the heart

Female patient with severe AS, age 74. She is complaining of recurrent attacks of chest pain & dyspnea and syncopal attacks for 2 years admitted to emergency department with syncopal attack. Condition started 2 years ago with dyspnea, syncopal attack, and chest pain with minimal effort.

Patient had Hypertension, DM on oral hypoglycemic drugs, 10 years-old deep vein thrombosis.

ECG findings

Normal sinus rhythm with heart rate 70-80 bpm with right BBB, after complete heart block, heart rate was 55 bpm with right bundle branch block.

Echo findings

EF: 65%, no wall motion abnormality, concentric left ventricle hypertrophy, diastolic dysfunction grade 1, mild mitral and aortic regurgitation (AR), left atrium diameter: 43 mm, aortic diameter: 32 mm, calcific limited mobility of aortic valve with severe stenosis, mean pressure gradient: 62 mmHg, peaked pressure gradient: 100 mmHg.

Left anterior descending artery mild lesion underwent transcatheter aortic valve replacement in Tanta University Hospital, and RCA os height is safe for TAVI. After operation, the valve cusps may open and close. Due to anatomical relationships between the aortic valve structure and the heart's conduction system, the treatment was followed by a total heart block that was addressed right away by implanting a dual chamber pacing (DDD) permanent pacemaker. Following TAVI, the patient was prescribed apixaban 2.5 mg twice day and one low-dose antiplatelet medication. Complete heart block caused by the anatomical relationship between the aortic valve's structure and the heart's conduction system was addressed right away with the implantation of a DDD permanent pacemaker. Following TAVI, the patient was prescribed apixaban 2.5 mg twice day and one low-dose antiplatelet medication. Figure 1.

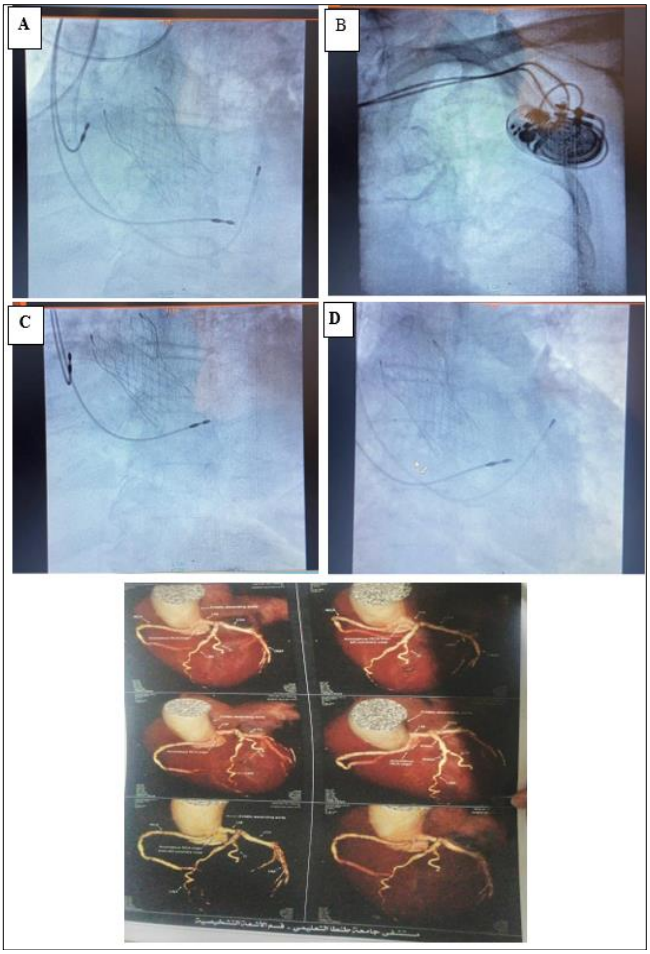

Fig 1: (A) and (D) shows well-functioning aortic valve after TAVI, (B) DDD pacemaker battery and (C) Atrial and Ventricular Leads of The DDD Pacemaker, right coronary artery malignant inter-arterial course ecstatic

Discussion

In the coming decades, the rising number of senior people with AS will provide enormous therapy challenges and place an enormous financial load on health care systems [6, 7].

Aged 26 to 80 years, 301 (43%) of the participants in the current study were men, and 399 (57%) were women. Traditional cardiometabolic risk factors were extremely frequent in the included population, 162 (23%) were HP, 287 (41%) were DM, 181 (26%) were smokers, 98 (25%) participants had CKD, and 217 (54%) had dyslipidemia. A large echocardiographic study showed that males, hypertension, hypercholesterolemia, smoking, DM, and a family history of the condition are associated with the prevalence of AS [8]. Regarding the etiology of AS in the study participants, 560 (80%) were degenerative 98 (14%) were rheumatic, 38 (5.5%) were congenital bicuspid, and 4 (0.5%) were congenital membranous, the severity of the AS, was mild in 406 (58%), moderate in 154 (22%), and severe in 112 (16%) participants. 28 (4%) had prosthetic valve,for other heart conditions in the study participants with moderate & severe AS, angina was present in 99 (47%), HF was in 50 (24%), and syncope was in 88 (42%) participants.

The most common valvular lesion in addition to AS was MR in 175 (25%) patients followed by AR and tricuspid regurgitation in 133 (19%) and 98 (14%) respectively. 224 (32%) patients didn't have other valvular lesions. Echo also showed that 287 (41%) patients had left ventricular hypertrophy. The EF of the study participants ranged from 41 to 70%, ECG findings were 476 (68%) had sinus rhythm, 126 (18%) had AF, 70 (10%) had left BBB, and 28 (4%) had pathological Q wave. And for the type of treatment in the study participants, it was medical in 561 (80%) participants, and surgical in 62 (9%), and TAVI in 6 (1%) participants.

The present study results were comparable with Danielsen *et al*. [9] Their findings demonstrated that patients aged 67–95 years and 58% were females also found that (96.2%) of the patients had mild AS and 3.8% moderate to severe AS also found [9], 22.2% with mild AS and 29.8% with moderate to severe AS were on statins.

In the present study, age was about 20 years younger than that of Bahaa *et al*. [10] who found that females were 52% of the patients. Also, noted that 66 (68.7%) of their participants had hypertension, 45 (46.8%) had diabetes, 3 (3.1%) participants were smokers, and 17 (17.7%) participants had CKD. Comparably their study also displayed that the prevalence of the most common valvular lesion in addition to AS was severe MR followed by tricuspid regurgitation (41%, and 25%, respectively) and documented that the ejection fraction was 62.8±12.6% in their AS patients and showed that 13 (13.5%) had AF and 8 (8.3%) had LBBB.

In their study, Khashaba *et al*. [11] found that 6 (60%) of their participants had hypertension, 7 (70%) had diabetes, 3 (30%) participants were smokers, and 3 (30%) participants had CKD, also observed that angina was present in 5 (50%) participants and syncope was in 3 (30%) participants Of particular concern as shown in the present study is tobacco use, which was abundant. Based to the 2015 Egyptian Health Issues Survey [12], smoking exposure is prevalent across all levels of affluence. It was also said that the study participants' EF had a mean value of 40.716.5 in it. As their primary emphasis was on high-risk patients with severe AS, they reported lower EF as opposed to our trial.

In line with the present research, Sahu *et al*. [13] Their results showed that 79 patients had degenerative AVS etiology, followed by congenital (n = 43) and 4 patients had rheumatic etiology. This variant scenario in the most common etiology could be as they included Indian population with subsequent ethnic difference between the Egyptian and the Indian.

Of note, RHD prevalence was not recorded in Hassanin *et al*.'s [14] registry in Egypt, but they hypothesised that it is the primary cause of the valvular heart disease reported in Upper Egypt given the high prevalence of AS seen there despite the patients' young ages. [15].

Additionally, Julius *et al*.'s research [16] revealed that angina pectoris incidence in AS patients has been estimated to be between 30% and 40% even in the absence of coexisting coronary artery disease. Additionally, in the PARTNER studies [17, 18], 20% of patients with severe AS also had concurrent moderate-to-severe MR.

As per Aldrugh *et al*. [19], who used LV mass indexed to height increased to the power of 2.7 to determine prevalence, 36% of patients had LVH.

In a prospective study, Gerdts *et al*. [20] showed that a higher LV mass at baseline was linked to a variety of clinical end-point outcomes, including all-cause death, cardiovascular (CV) death, ischemic CV events, and aortic valve events. They did this by following the patients for about 4 years.

In the words of Weber *et al*. [21], patients with biologic valves have an expected survival rate that is much lower than those with mechanical valves. Several studies also combined different types of bioprosthetic valves. Chambers *et al*. [22] discuss the many forms of bioprosthetic valves. The stented and stentless biological valves used for comparison showed no appreciable variations in hemodynamic performance or clinical occurrences in the immediate postoperative period or in the first follow-up to 5 years.

Muneretto and others, [23]. It was discovered that, when compared to traditional surgery and sutureless valve implantation, transcatheter aortic valve replacement in patients with an intermediate- to high-risk profile was associated with a significantly higher incidence of perioperative complications and decreased survival at the short- and mid-term.

Limitations: Number of participants was relatively small. The included centres' inability to maintain standardised databases and records led to the acquisition of insufficient data.

Conclusions

Judging to the existing survey, both sexes of the population who were 50 and older had the most growth. A major health and financial issue will be how to handle and cure age-related disorders in the sizable elderly population in the future. Nevertheless, there is currently no medical intervention that can stop the progression of AS. Fortunately, predictions for older individuals getting AVI by surgery or TAVI is much better. A TAVI program should be initiated to include more patients with severe AS to undergo the procedure. Screening programs are needed for the early detection of AS cases. Patient-education campaigns among AS patients to educate them about TAVI and its positive effect on their health and its ability to decrease mortality rates are needed.

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Conflicts of interest: Nil

References

1. Bonow RO, Carabello BA, Kanu C, de Leon AC, Jr., Faxon DP, Freed MD, *et al*. ACC/AHA 2006 guidelines for the management of patients with valvular heart disease: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (writing committee to revise the 1998 Guidelines for the Management of Patients With Valvular Heart Disease): developed in collaboration with the Society of Cardiovascular Anesthesiologists: endorsed by the Society for Cardiovascular Angiography and Interventions and the Society of Thoracic Surgeons. Circulation. 2006;114:e84-231.
2. Zhang D, Guo W, Al-Hijji MA, El Sabbagh A, Lewis BR, Greason K, *et al*. Outcomes of Patients With Severe Symptomatic Aortic Valve Stenosis After Chest Radiation: Transcatheter Versus Surgical Aortic Valve Replacement. J Am Heart Assoc. 2019;8:e012110.
3. Andell P, Li X, Martinsson A, Andersson C, Stagmo M, Zöller B, *et al*. Epidemiology of valvular heart disease

in a Swedish nationwide hospital-based register study. Heart. 2017;103:1696-703.
4. Vaht K, Göransson M, Carlson K, Isaksson C, Lenhoff S, Sandstedt A, *et al*. Incidence and outcome of acquired aplastic anemia: real-world data from patients diagnosed in Sweden from 2000-2011. Haematologica. 2017;102:1683-90.
5. Nishimura RA, Otto CM, Bonow RO, Carabello BA, Erwin JP, 3rd, Fleisher LA, *et al*. AHA/ACC Focused Update of the 2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Circulation. 2017;135:e1159-e95.
6. Strange GA, Stewart S, Curzen N, Ray S, Kendall S, Braidley P, *et al*. Uncovering the treatable burden of severe aortic stenosis in the UK. Open heart. 2022;9:e001783.
7. Lindman BR, Clavel MA, Mathieu P, Iung B, Lancellotti P, Otto CM, *et al*. Calcific aortic stenosis. Nat Rev Dis Primers. 2016;2:16006.
8. Picardo PJ, Khariong PD, Hajong R, Hajong D, Naku N, Anand M, *et al*. Study of Aortic Valve Sclerosis as A Marker of Atherosclerosis in Acute Coronary Syndromes. J Clin Diagn Res. 2016;10:Oc05-oc9.
9. Danielsen R, Aspelund T, Harris TB, Gudnason V. The prevalence of aortic stenosis in the elderly in Iceland and predictions for the coming decades: the AGES-Reykjavík study. Int J Cardiol. 2014;176:916-22.
10. Bahaa H, Sadek Y, Mostafa AE, Kamal D, Baraka M, Abdelghani M, *et al*. Early results from an Egyptian transcatheter aortic valve registry (Egy-TVR). The Egyptian Heart Journal. 2021;73:67.
11. Khashaba AA, Adel W, Roshdi A, Gafar A, Essam S, Algendy MAS. First Egyptian experience of Transcatheter Aortic Valve Implantation: Immediate results and one year follow up. The Egyptian Heart Journal. 2014;66:17-21.
12. Mostafa A, Mohammed HT, Hussein RS, Hussein WM, Elhabiby M, Safwat W, *et al*. Do pictorial health warnings on waterpipe tobacco packs matter? Recall effectiveness among Egyptian waterpipe smokers & non-smokers. PLoS One. 2018;13:e0208590.
13. Sahu AK, Sagar P, Khanna R, Kumar S, Tewari S, Kapoor A, *et al*. Etiology and distribution of isolated aortic stenosis in Indian patients - A study from a large tertiary care hospital in north India. Indian Heart J. 2020;72:272-7.
14. Hassanin A, Hassanein M, Bendary A, Maksoud MA. Demographics, clinical characteristics, and outcomes among hospitalized heart failure patients across different regions of Egypt. The Egyptian Heart Journal. 2020;72:49.
15. Kotit S, Said K, ElFaramawy A, Mahmoud H, Phillips DIW, Yacoub MH. Prevalence and prognostic value of echocardiographic screening for rheumatic heart disease. Open Heart. 2017;4:e000702.
16. Julius BK, Spillmann M, Vassalli G, Villari B, Eberli FR, Hess OM. Angina Pectoris in Patients With Aortic Stenosis and Normal Coronary Arteries. Circulation. 1997;95:892-8.
17. Smith CR, Leon MB, Mack MJ, Miller DC, Moses JW, Svensson LG, *et al*. Transcatheter versus surgical aortic-valve replacement in high-risk patients. N Engl J Med. 2011;364:2187-98.
18. Lindman BR, Maniar HS, Jaber WA, Lerakis S, Mack MJ, Suri RM, *et al*. Effect of tricuspid regurgitation and the right heart on survival after transcatheter aortic valve replacement: insights from the Placement of Aortic Transcatheter Valves II inoperable cohort. Circ Cardiovasc Interv; c2015, 8.
19. Aldrugh S, Valle JE, Parker MW, Harrington CM, Aurigemma GP. Prevalence of Left Ventricular Hypertrophy Caused by Systemic Hypertension Preceding the Development of Severe Aortic Stenosis. American Journal of Cardiology. 2021;150:89-94.
20. Gerdts E, Rossebø AB, Pedersen TR, Cioffi G, Lønnebakken MT, Cramariuc D, *et al*. Relation of Left Ventricular Mass to Prognosis in Initially Asymptomatic Mild to Moderate Aortic Valve Stenosis. Circ Cardiovasc Imaging. Discussion. 2015;8:e003644.
21. Weber A, Noureddine H, Englberger L, Dick F, Gahl B, Aymard T, *et al*. Ten-year comparison of pericardial tissue valves versus mechanical prostheses for aortic valve replacement in patients younger than 60 years of age. J Thorac Cardiovasc Surg. 2012;144:1075-83.
22. Chambers JB, Rimington HM, Hodson F, Rajani R, Blauth CI. The subcoronary Toronto stentless versus supra-annular Perimount stented replacement aortic valve: early clinical and hemodynamic results of a randomized comparison in 160 patients. J Thorac Cardiovasc Surg. 2006;131:878-2.
23. Muneretto C, Alfieri O, Cesana BM, Bisleri G, De Bonis M, Di Bartolomeo R, *et al*. A comparison of conventional surgery, transcatheter aortic valve replacement, and sutureless valves in "real-world" patients with aortic stenosis and intermediate- to high-risk profile. J Thorac Cardiovasc Surg. 2015;150:1570-7. Discussion 7-9.