

AORTIC VALVE CALCIFICATION IN THE ELDERLY; CLINICAL, LABORATORY AND ECHOCARDIOGRAPHIC CORRELATES

Thesis submitted for partial fulfillment of Masters Degree in cardiology

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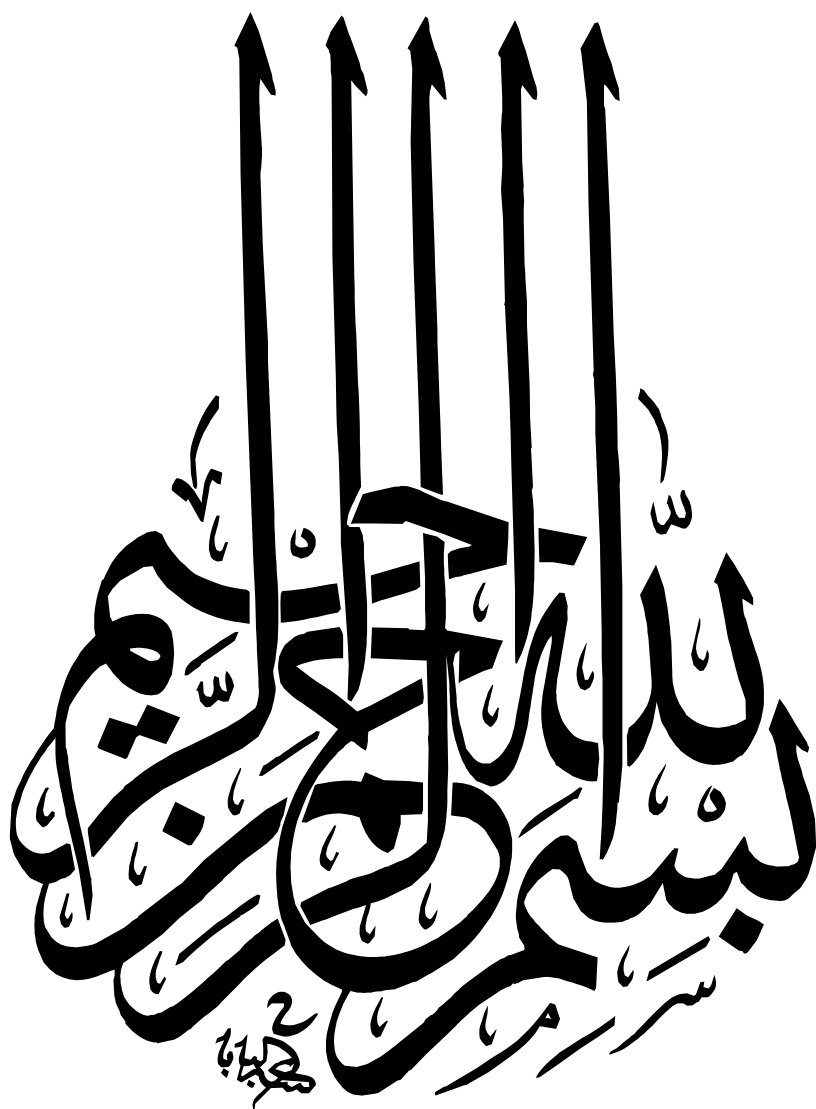
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Abbreviation

ACE:	Angiotensin converting enzyme
AF:	Atrial fibrillation
AMSG:	Aortic Mean Systolic Gradient
APSG:	Aortic Peak Systolic Gradient
APV:	Aortic Peak Velocity
AR:	Aortic regurgitation
ARD:	Aortic root dimension
AS:	Aortic stenosis
AVA:	Aortic valve area
AVC:	Aortic valve calcification
AVS:	Aortic valve sclerosis

BMI:	Body mass index
BSA:	Body surface area
CAD:	Coronary artery disease
CMR:	Cardiac magnetic resonance
CT:	Chest computed tomography
CWD:	Continues wave Doppler
DBP:	Diastolic blood pressure
DM:	Diabetes mellitus
DSE:	Dobutamine stress echocardiography
ECG:	Electrocardiogram

EF:	Ejection fraction
HF:	Heart failure
Hg:	Hemoglobin
HTN:	Hypertension
HR:	Heart rate
IHD:	Ischemic heart disease
IVSD:	Intreventricular Septal Dimension
LAD:	Left Atrial dimension
LDL:	Low density lipoprotein
LVEDD:	Left ventricular end diastolic dimension
LVESD:	Left ventricular end systolic dimension
LV:	Left ventricular

LVOT:	Left ventricular outflow tract
MVD:	Mitral valve disease
PWD:	Posterior wall dimension
RR:	Respiratory rate
SBP:	Systolic blood pressure
TG:	Triglycerides
WBC:	White blood cells

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Abstract

Objective: This study aimed to compare a group of patients with calcific aortic valve disease in the elderly and its correlation with clinical, laboratory, electrocardiography, and echocardiography variables.

Background: Aortic valve calcification (AVC) is associated with increased cardiovascular morbidity and mortality among the elderly, but the mechanisms underlying this association remain controversial. AVC and atherosclerosis shares many similarities of risk factors.

Methods: The study included fifty calcific aortic valve patients, above the age of 65, not known rheumatic or valvular equal and heart disease, patients selected and studied by transthoracic echocardiography, aortic valve calcification was scored (grade 1 = no calcification, grade 2 = mild, grade 3 = moderate and grade 4 = severe calcification), all patients are examined clinically, 12 lead ECG was done for evidence of arrhythmias. The following risk factors were assessed: patient age (≥ 65 years), gender, BMI, BSA, present smoking, hypertension, and diabetes, signs of heart failure and evidence of ischemic heart disease. In addition, fasting blood samples were taken from all patients, full blood count, serum urea and creatinine, ionized serum calcium and phosphate, serum levels of LDL cholesterol, HDL, triglyceride and total cholesterol were measured.

Results: Mild aortic valve calcification was seen in 32 patients (64%) and moderate to severe calcification in 18 (36%). 33 of studied group are male (66%) were 17 (34%) are female. The mean age was 70.9 ± 5.437 years. The mean BMI was 28.57 ± 4.95 .

The prevalence of ischemic heart disease is 38 (76%), diabetic mellitus is 26 (52%), smoking 25(50%), hypertension 34 (68%), dyslipidemic patients 29 (58%). Patient associated with Atrial symptoms and signs of heart failure are 29 (58%), fibrillation 15 (30%), 8 patients (16%) bradycardia and heart block.

Conclusion: AVC is a common valvular disease in the elderly and is progressive disease, share similar atherosclerosis risk factors that can cause the mechanism of aortic calcification. AVC (sclerosis) can be found accidentally during imaging and examination and can be predictor of associated cardiac diseases.

Keywords: Aortic valve calcification, Elderly patients, Risk factors.

Introduction:

Age related changes in the fibromuscular skeleton of the heart include myxomatous degeneration and collagen infiltration termed sclerosis. Another change is calcification of the aortic valve leaflets, aortic annulus, base of the semilunar cusps, and mitral annulus. The underlying processes involve lipid accumulation, inflammation, remodeling of the extracellular matrix, angiogenesis and finally calcification.

Calcific aortic stenosis is the most common valve disorder in the western world, and is a third most common cause of aortic valve disease in the developed countries.(1)

There is compelling histopathologic and clinical data suggesting that calcific valve disease is an active disease process akin to atherosclerosis (2). Aortic valve calcification of non rheumatic etiology is not rare.

Traditional risk factors of atherosclerosis; Age, gender, diabetes mellitus, hypertension, obesity, and smoking shears similarity risk factors of aortic valve calcification.

Higher serum phosphate levels was associated with valvular and annular calcification in a community based cohort of older adults. Phosphate may be a novel risk factor for calcific aortic valve disease. Low density lipoprotein was a risk factor for aortic valve calcification only in participants younger than 65 years, whereas the total cholesterol/high density lipoprotein

cholesterol ratio was associated with a modest increased risk of aortic valve calcification across all ages. (3)

The expected relationship between calcium deposition on the aortic valve with advanced age and the factors predisposing to it is not well documented in the literature.