

CARDIOLOGY UPDATES NEWSLETTER

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Dear Doctor,

Greetings from Micro Labs Limited. We are happy to bring you “Cardiology updates” which contains latest and interesting news in the field of Cardiology

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Evaluation of the diagnostic performance of a method for acoustic analysis of turbulent murmur caused by coronary artery stenosis in patients with coronary artery disease

Cardiovascular disease has not only increased economic burden but also has threatens human health and life. According to studies, approximately 330 million people have cardiovascular diseases including 11.39 million people with coronary artery disease. coronary artery atherosclerosis is one of the common cause of coronary artery disease leading to myocardial ischemia, hypoxia, or necrosis. However, some studies have come up with an acoustic analysis of turbulent murmur caused by coronary artery stenosis (a new and promising method for the diagnosis coronary artery disease). Dock et al. by using phonocardiography had detected a diastolic murmur associated with coronary stenosis. After sometimes, other studies too reported heart murmurs similar to Dock's murmur. In last few years, diastolic murmur signal associated with coronary artery stenosis has been detected with modern acoustic detection equipment and analysis methods

Zhao P G aimed to evaluate the diagnostic performance of a method for acoustic analysis of turbulent murmur caused by coronary artery stenosis in coronary artery disease (CAD). This prospective study enrolled 452 Patients admitted to the cardiovascular department for elective coronary angiography. For recording heart sounds a digital electronic stethoscope was used before angiography. Quantitative coronary angiography (QCA) was used as a "gold standard" for the diagnosis of Coronary artery disease and to evaluate the diagnostic performance of the acoustic analysis method for Coronary artery disease

A total of 452 patients completed Quantitative coronary angiography and heart sound data. Acoustic analysis revealed 310 disease cases and 142 normal cases. Increasing the values of coronary artery diameter stenosis from 30% to 50%, 70%, and 90% raised the sensitivity and negative predictive value of the acoustic analysis method. the sensitivity was 75.6%, 81.9%, 83.3%, and 85.7%, respectively while the negative predictive value was 33.1%, 57.0%, 69.7%, and 88.0%, respectively. On the other hand, specificity and positive predictive value decreased i.e. 75.8%, 70.4%, 51.0%, and 37.5%, respectively and AUC values were 0.757, 0.762, 0.672, and 0.616, respectively.

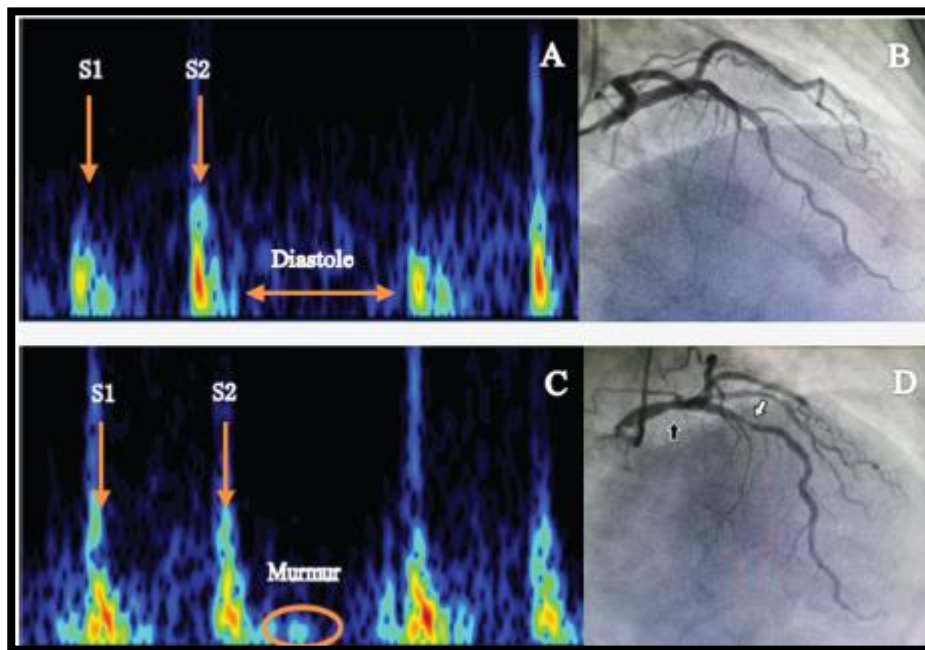


Figure 1:Acoustic Analysis Results and Corresponding Angiograms

It was also found that the sensitivity of the acoustic analysis method for one-vessel disease was 86.6%. At the same time, sensitivity for identifying left anterior descending coronary artery lesions was at 90.7%. The sensitivity for identifying isolated coronary artery branch lesions was 66.7% and for identifying three-vessel disease in multi-vessel coronary artery lesions was at 82.9%.

Conclusion: For the diagnosis of Coronary artery disease, acoustic analysis of turbulent murmur has favourable performance in patients with coronary artery stenosis

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Cardiovascular assessments and management of findings in patients with Eating Disorders

Eating disorders (EDs) are defined as the serious conditions with marked imbalances in eating behaviour and are also associated with distorted body image and extremes of weight. Eating disorders is commonly observed in children, adolescents and young adults that considerable threat to their health and wellbeing leading to severe psychiatric and medical complications and decreased quality of life.¹ Eating disorders is classified into four well defined disorders including binge eating disorder (BED), avoidant/ restrictive. Eating disorders must be immediately diagnosed and treated to avoid high morbidity and mortality associated with this condition²

According to studies, 1 in 8 young adults may have at least one eating disorder by twenty years of age. Prevalence of anorexia nervosa and bulimia nervosa are approximately 0.3% and 1% among adolescent females respectively.²

Cases of eating disorder was found to be increased in all age groups following the Covid-19 pandemic with patient's presentations being more medically compromised compared to previous years.

This study aimed to study and identify the physiological context in which cardiovascular complications develop, systematically outline these complications and to suggest a pragmatic approach to their clinical evaluation in people with eating disorders.

To conduct this review, relevant literature, guidelines and academic texts were studied and analysed. Conclusions of each studied were extracted and were verified by a Child and Adolescent Psychiatrist and Adolescent Paediatrician before adding to the study.

This study also highlighted that the cardiovascular complications in Eating disorders are mostly associated to malnutrition, and patients having Anorexia Nervosa (fig 2) have higher chances of structural and functional cardiac abnormalities, such as aberrations of heart rate and rhythm, haemodynamic changes and peripheral vascular abnormalities.

Structural and functional cardiac abnormalities	Repolarisation and conduction abnormalities	Haemodynamic abnormalities	Peripheral vascular abnormalities
Decreased left ventricular mass (LVM) Decreased left ventricular systolic function Mitral valve prolapse Pericardial effusions Myocardial fibrosis → Increased risk of sudden cardiac death ←	Sinus node dysfunction: Sinus ^a bradycardia, Sinus pauses and Junctional escape rhythms AV conduction delay QTc prolongation and Increased QT dispersion (secondary to electrolyte deficiency and medications)	Hypotension ^a Orthostatic hypotension and tachycardia ^a Syncope ^a Autonomic dysfunction	Acrocyanosis Dysregulation of peripheral vasoconstriction and vasodilation

Figure 2 Summary of cardiovascular complications in anorexia nervosa

In most patients with Bulimia Nervosa, cardiovascular abnormalities are observed secondary to electrolyte imbalances. Avoidant or restrictive Food Intake Disorder and Binge Eating Disorder are commonly associated with distinct cardiovascular complications. With nutritional restoration, and normalisation of eating behaviours, some of the cardiovascular complications get reversible, such as cessation of purging. Complete and thorough physical examination along with detailed clinical enquiry is required to ensure the medical safety of young adults with eating disorder.

Conclusion: Analysing cardiovascular Complications in Eating disorder and collaborating with acute medical teams allows community clinicians to detect patient at highest risk of and minimise the complications

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Study of Thoracic aortic dilatation, aortic dimensions and growth, and the incidence of aortic dissection in women with Turner syndrome: A Systematic review

Turner syndrome (TS) or congenital ovarian hypoplasia syndrome is one of the common sex chromosomal abnormality found in females.¹ TS affects women with both absent or incomplete X-chromosome. Approx. 1:2500 is the incidence of TS among live-born females. However, actually prevalence rate is unknown as many patients may remain undiagnosed. Occurrence rate of this syndrome similar in different ethnicities and different countries. Common features of TS includes short stature, gonadal dysgenesis, and cardiovascular disease.² Common congenital cardiac defects seen in Turner syndrome include bicuspid aortic valve (BAV), aortic coarctation (COA), abnormal pulmonary venous return, aortic dilatation and dissection. However, at the end of the 20th century, increased in the case reports published on aortic dissection in women with TS raised the awareness and research on aortic disease.¹

Meccanici F et al aimed to review and analyse the prevalence of thoracic aortic dilatation, aortic dimensions and growth, and the incidence of aortic dissection in patients with Turner syndrome

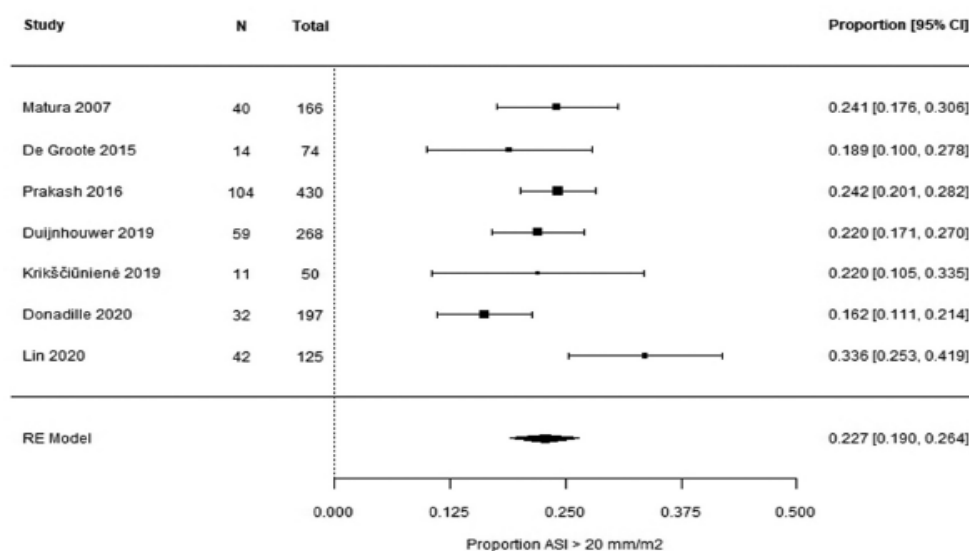


Figure 3: Forest plot of prevalence of aortic dilatation defined as an ASI > 20 mm/m2 in the ascending aorta.

In this analysis, systematic literature searches were done and observational studies with diagnosed Turner syndrome were included, while studies with children aged <15 years old or specific Turner syndrome were excluded. 21 studies were screened and included. 23% was the pooled prevalence of ascending aortic dilatation (fig 1) while the incidence of aortic dissection was 164 per 100.000 patient-years. However, 3 studies showed aortic growth over time to be limited. It was also observed that the risk factors for aortic dilation were increased age, bicuspid aortic valve, aortic coarctation, and hypertension.

Conclusion: This study concluded that, ascending aortic dilatation is common in adult women with Turner syndrome and the hazard of aortic dissection increases too when compared to general population, and aortic growth is limited. It is not all possible for Conventional risk markers to identify and explain all aortic dissection cases, that is why new imaging parameters and blood biomarkers are required to improve prediction, making easy patients follow-up and surgical decision-making

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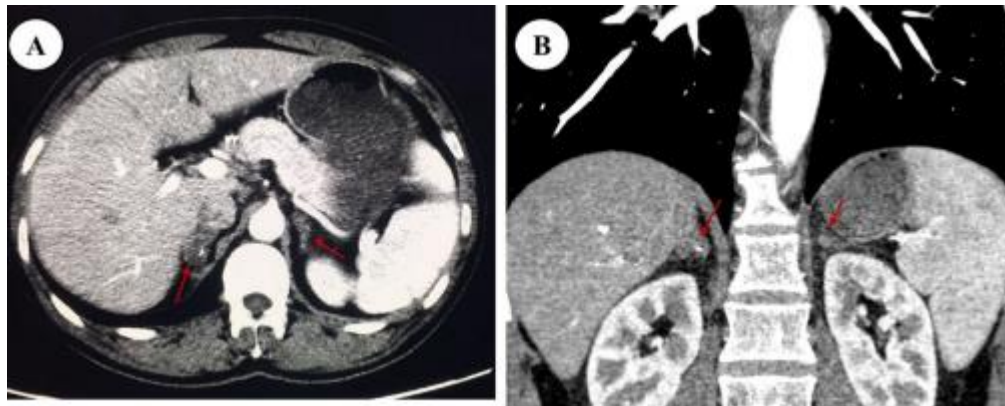
Coronary artery disease in a patient with Addison's disease: A case report and literature Review

Primary adrenal insufficiency (PAI), known as Addison's disease was first reported in 1855¹. Prevalence estimates have ranged from 9 to 22 per 100,000 in white population. The mortality rates have been about two times greater in those with AAD than in matched control populations, mainly due to cardiovascular disease. In the general population, sudden cardiac death will be headed by some form of cardiac disease in approximately two thirds of patients². Hypertension, dyslipidemia, and inflammation are closely connected to the process of atherosclerosis. Adrenal insufficiency leads to insufficient secretion of glucocorticoids and mineralocorticoids, which further leads to disorders of water, electrolyte, glucose and lipid metabolism and inflammation. The co-existing occurrence of CAD and Addison's disease is 6.9–10 cases per 1000,000 which is infrequent¹. The objective of this study is to discuss a case of CAD combined with Addison's disease, with manifestations of chest pain and hypotension.

Case Report

A patient of 51-year-old male admitted to the hospital for recurrent chest pain for 2+years, which provoked with fatigue for 3+months. Past history include 2 years earlier, the patient noticed chest pain while climbing the mountain (CCS Grade I), which radiated to the back, diagnosed as coronary artery and treated with simvastatin. Three months before the hospitalization, the patient experienced chest pain at rest (CCS Grade II), diagnosed as angina pectoris could be relieved by nitroglycerin. Coronary angiography showed 80% stenosis of the proximal right coronary artery, 40% stenosis of the proximal circumflex artery, and 30% stenosis in the middle of the anterior descending branch. Ten local hospital prescribed him aspirin+clopidogrel+perindopril+metoprolol, nitroglycerin at necessary

Patient had smoked roughly 20 cigarettes per day for 32 years, smoking cessation for 2 years, Physical examination, the patient presented a hypotension of 72/56 mmHg. Patient's bare skin, lips, oral mucosa, areola, and palm lines were visibly pigmented. A chest CT scan performed 2 months earlier revealed old pulmonary tuberculosis. Admission examination results were as follows ambulatory blood pressure revealed a slightly low diastolic blood pressure. Ambulatory electrocardiogram indicated ST-T depression and Color Doppler ultrasound of the carotid arteries suggested the formation of bilateral carotid plaques. Further examination found the level of cortisol significantly reduced while ACTH increased.



The 24 h ACTH and cortisol circadian rhythms further indicated the abnormality of the circadian rhythm. Enhanced CT of the abdomen showed visible uneven irregular thickening of the bilateral adrenal glands with a few punctate calcifications as shown in figure 3. Pulmonary and adrenal tuberculosis was considered. Tuberculosis antibody was 2+ and T-SPOT was positive, patient was diagnosed as with primary adrenal hypo function caused by adrenal tuberculosis combined with CAD. Anti-tuberculosis treatment and hormone replacement therapy were initiated. Hormone replacement therapy is hydrocortisone 30 mg each morning and 20 mg each afternoon when the anti-tuberculosis therapy persisted, while 20 mg each morning and 10 mg each afternoon after the anti-tuberculosis therapy.

Treatment includes aspirin+perindopril+metoprolol+simvastatin, was retained. During last follow-up, the patient's chest CT adrenal enhanced CT and coronary angiography remained stable.

Conclusion: Study concludes that Hyperpigmentation, unexplained hypotension, unexplained hyponatremia, and hypokalemia are all crucial clues to diagnose Addison's disease.

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Conclusion: Study concludes that Hyperpigmentation, unexplained hypotension, unexplained hyponatremia, and hypokalemia are all crucial clues to diagnose Addison's disease



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