CARDIOLOGY UPDATES NEWSLETTER

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IN THIS ISSUE

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

Assessment of cardiovascular disease risk in type 2 diabetes using a novel test

INTRODUCTION

Cardiovascular Disease

Cardiovascular disease(CVD) is the most common cause of mortality in people with type 1 and type 2 Diabetes mellitus(DM). The relative risk for CVD morbidity and death in adults with DM varies from 1 to 3 in men and from 2 to 3 in women when compared to those without DM. While cardiovascular mortality is significantly increased by diabetes, the risk is twofold in people with Type 2 Diabetes who also have diagnosed CVD [(2)]. Clinical risk assessment and trial design can benefit from understanding the relative risk of various cardiovascular diseases among people with type 2 diabetes [(3)]. The Cardiovascular disease in type-2 diabetes(CVD-T2D) test provides a person's risk score for experiencing cardiovascular events such as heart attacks, strokes, heart failure hospitalization, or cardiovascular mortality within 4 years. The CVD-T2D test may effectively risk-stratify patients, determine how likely they are to develop a condition, and improve the patient's outcome. The aim of this study was to determine whether the CVD-T2D test enhances the capacity to risk stratify, diagnose and treat patients with T2DM [(1)].

METHOD

This was a phase-2 randomized controlled trial conducted with 228 physicians (cardiologists and primary care physicians). Participants were randomized into three groups: Control, Intervention using just the CVD-T2D Test, and second intervention using both the CVDT2D Test and a panel of metabolic variables. Each participant took care of six simulated CPVs, three in each of the two rounds of the pre-post design. The Clinical Performance and Value(CPV) simulated patients' cases were used in the QURE CVD Evaluation of Risk in Diabetes Mellitus (QuiCER DM) Study to compare the clinical workup, diagnosis, and therapy of patients with T2DM. The primary outcomes were whether the CVD- T2D test ± Metabolic Panel showed greater clinical value and improved patient care. To analyse binary outcomes they used the chi-square test and logistic regression. Stata 17.0 was used for all analyses.

RESULTS

The current study results showed that from baseline round 1 to round 2 they detected no significant change in the cardiovascular risk stratification in the control group (37.1 to 38.3%). In contrast, risk stratification significantly improved in all cases for both intervention 1 (38.7 to 65.3%) and intervention 2(41.9 to 65.8%). Improvements over control were +25.4% and +22.7% for interventions 1 and 2, respectively, according to the formal difference-in-difference

estimation model ($p<0.01$ for both). By case type, patients with 3+ CV risk factors showed the greatest significant improvement. Compared to Control, Intervention 1 showed a difference in-difference improvement of +26.3% ($p=0.020$), while intervention 2 showed a difference-in-difference improvement of +27.7% ($p=0.015$). There were no differences in the overall pharmacological treatment between the control and intervention group. In comparison to the control, both intervention groups significantly increased prescribing of SGLT2 inhibitors and GLP1 receptor agonists (Figure 1). Between rounds 1 and 2, non-pharmacological therapy such as counselling on diet, weight reduction, exercise, and quitting smoking, significantly improved in both intervention groups as compared to the control. Monitoring HgbA1C, blood pressure, and the number of follow up visits improved in intervention 1 and in intervention 2 compared with control.

	ROUND 1	ROUND 2	P-Value
SGLT2i/GLP1 RA			
Control	35.4%	45.0%	0.082
Intervention 1	38.4%	66.9%	<0.001
Intervention 2	43.3%	72.3%	<0.001
P-value	0.359	<0.001	

Table 1- Use of SGLT2i or GLP1 RA.

DISCUSSION

The current study showed that both intervention groups significantly increased prescribing of SGLT2 inhibitors and GLP1 receptor agonists especially in cases with high risk score. According to the Adhikari R et.al study, cardioprotective SGLT2 inhibitors and GLP1 receptor agonists reduced the excess risk of adverse CV events in patients with type 2 diabetes [(2)].

CONCLUSION

The current study concludes that the use of CVD-T2D test significantly enhanced T2DM patients' ability to stratify their CV risk. Treatment were shown to have statistically significant increases, particularly SGLT2 inhibitors, GLP1 receptor antagonists and recommendation for evidence based non pharmacologic treatments.

The use of The Cardiovascular disease in type-2 diabetes test significantly enhanced Type 2 diabetes patients' ability to stratify their Cardiovascular risk.

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Association between Left Ventricular Remodeling and the Development of Arterial Stiffness

INTRODUCTION

Heart failure (HF) is a serious public health concern with more than 23 million cases exist world-wide [(1)]. The central aorta functions as a blood vessel to carry blood to the body's peripheral organs and as a shock absorber for the heart's pulsatile pressure and flow. Because the aorta is stiffer, it has less of a pulsatile pressure buffering effect, which increases left ventricular (LV) afterload. As a result, arterial stiffness has been associated to the prevalence of cardiovascular disease [(2)]. A substantial risk factor for heart failure (HF) found by the Framingham Heart Study is increased arterial stiffness as measured by pulse wave velocity (PWV). The aim of this study was to evaluate the association between left ventricular Remodeling and the progression of Arterial stiffness [(1)].

METHOD

A Retrospective community based cohort study was conducted in 317 participants who had baseline-normal cardio-ankle vascular index (CAVI) and were free of cardiovascular disease. All individuals had their fasting serum levels of glucose, cholesterol, creatinine, and BNP (B-type natriuretic peptide) tested. Transthoracic echocardiography was used to measure the size, mass, and function of the Left Ventricle (LV). To measure early (E) and late (A) peak velocities, pulsed-wave Doppler analysis of the mitral input was done. To determine the mean early diastolic velocity, tissue Doppler mitral annular early diastolic velocity (e') of the septal and lateral sides were measured and averaged. LV global longitudinal strain (LVGLS) was assessed by speckle-tracking. The Chi-square test was used to compare categorical variables, and the appropriate t-test or Wilcoxon rank sum test was used to analyse continuous variables. JMP 14 (SAS Institute) statistical software was used for all statistical analyses.

RESULTS

The current study results showed that Women were older and more likely to have hyperlipidaemia than men, who also had significantly higher BMIs, higher rates of diabetes and current smoking (all P< 0.05). Men and women did not have different baseline CAVI value (figure 1). LVGLS decreased and LV mass index increased considerably (both P<0.001) in the entire population. On the other hand, the LVEF remained unchanged. E/A ratio and e' velocity, two LV diastolic metrics, decreased (both P< 0.05) throughout follow-up, although E/e' ratio remained stable. Men were found to have larger LV sizes, higher LV mass indexes, and worse LVGLS than women, while women were found to have considerably higher E/e' ratios (all P< 0.05). After adjusting for demographics and baseline cardiovascular variables, generalized estimating equation analyses revealed that longitudinal increases in CAVI were not associated with changes in LV mass index or e' velocity, rather they were associated with impaired LVGLS (estimate 0.46, 95% CI: 0.11-0.82; P = 0.010). CAVI progression remained linked with change in LVGLS even after adjusting for longitudinal change in variables (estimate 0.50, 95% CI: 0.16-0.85; P = 0.004). Only women in the sex-specific analysis showed a significant relationship between CAVI advancement and LVGLS decline (estimate 0.92, 95% CI: 0.27-1.58; P = 0.006).

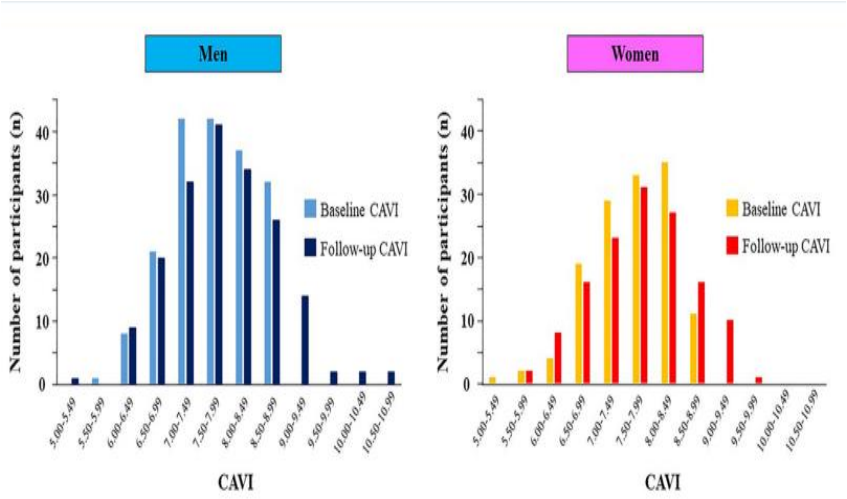

Figure 1- CAVI Values at baseline and follow-up Stratified by sex

DISCUSSION

The current study showed the relationship between changes in LV structure and function and longitudinal changes in arterial stiffness in a community based population without significant cardiovascular disease. Even at an early, subclinical stage before LVEF decreases, the larger trend in arterial stiffness was significantly associated with adverse LV remodelling. Similar to this study Ohyama Y et.al study showed the positive correlation between higher LV mass index and LV mass volume ratio (LVMVR) shows that increased aortic arch stiffness is related to greater LV concentric Remodeling [(2)].

CONCLUSION

The current study concludes that LVGLS worsening in individuals without cardiovascular disease is independently associated with an increase in arterial stiffness and this study also demonstrated the crucial part that vascular ventricular coupling plays in the progressive deterioration of ventricular function. Increased arterial stiffness prevention measures may help to avoid Clinical HF and a decline in LV function.

Left ventricular global longitudinal strain worsening in individuals without cardiovascular disease is independently associated with an increase in arterial stiffness.

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The preventive study of association between metabolic syndrome, hypertension, and chronic depression in postmenopausal women.

INTRODUCTION

The risk of cardiovascular events is increased by a group of risk factors known as the metabolic syndrome (MetS), which includes central obesity, hypertension, hyperglycaemia, hypertriglyceridemia, and low high-density lipoprotein (HDL) cholesterol. The most prevalent psychiatric condition worldwide and in primary healthcare settings is chronic depression (CD). Cardiovascular patients are significantly more likely to have CD, with prevalence rates ranging from 20% to 45% than the general population. In clinical practice, a difficult issue is the early diagnosis of CD [(1)]. For postmenopausal women, metabolic syndrome and psychosocial problems are serious health problems [(2)]. It's essential to treat CD when it's diagnosed in postmenopausal women with MetS in order to enhance their quality of life. The aim of this study was to determine the prevalence of CD in postmenopausal women with MetS and/or hypertension [(1)].

METHODS

A total of 500 postmenopausal women with hypertension between the ages of 48 and 68 and 100 consecutive postmenopausal women with MetS were included in this study. A total of 500 consecutive normotensive women without MetS, aged 48 to 68, were included in the control group. Along with anthropometric data such as body weight, height, BMI, and waist and hip circumference measurements, a thorough personal history of metabolic and CVD was also obtained. The individuals' BP values were determined by averaging their three blood pressure readings. The Adult Treatment Panel III of the National Cholesterol Education Program was used to diagnose MetS. According to the National Institute for Health and Care Excellence (NICE) 2009 Guidelines, CD recognition and assessment were done for all women receiving therapy together with anti-depressive medication and cognitive behavioural therapy. After 10 minutes of rest, the patient had transthoracic echocardiography while lying in the left lateral decubitus position on a 30°-raised exam table. A multifrequency transducer-equipped Echo-Doppler device called the Philips Epiq 7 Ultrasound device for Cardiology, Healthcare, Viale Sarca 235, Milan (Italy), was employed. A diagnosis of cardiomyopathy was made using well established criteria.

RESULTS

The current study results showed that when compared to the control group, postmenopausal women with MetS had a significantly greater rate of CD [P<0.007]. Women with MetS and hypertension had a significantly greater CD rate (P <0.0000) [Table 1]. Women with MetS and women with hypertension both had similar CD rates, and also women with metabolic cardiomyopathy and women with hypertensive cardiomyopathy (P<0.44 and P<0.65, respectively). Women with metabolic cardiomyopathy and women with hypertensive cardiomyopathy both had significantly higher CD rates than controls (P<0.0000 and P<0.0000, respectively).

	HYPERTENSION	CONTROL	ODDS RATIO	P-VALUE
All Women	500	500		
Women with CD	107(27%)	45(8%)	2.7	<0.000
Women with CD and Metabolic cardiomyopathy	43(8%)	0	2.9	<0.00

Table-1 Comparison of women with hypertension and controls for the prevalence of CD.

DISCUSSION

The current study showed that in postmenopausal females with MetS, CD is relatively common. Women with MetS had a two-fold higher risk than the general population of developing CD, while hypertensive women had an approximately three-fold higher risk. Similar to this study, Kwon E et.al study showed that in postmenopausal women, it was found

that trait anxiety and depression were associated with the prevalence of metabolic syndrome [2].

CONCLUSION

The current study concludes that there is an association between MetS and CD in postmenopausal women that is significantly greater in the presence of hypertension. The association, however, was similar among women who had hypertensive or metabolic cardiomyopathy. An intervention is required to improve CD diagnosis in postmenopausal women, especially in those with MetS and/or hypertension because undiagnosed and untreated CD is linked to poor cardiovascular outcomes.

An association between Metabolic syndrome and Chronic depression in postmenopausal women that is significantly greater in the presence of hypertension. The association, however, was similar among women who had hypertensive or metabolic cardiomyopathy.

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A rare congenital heart disease complication in a child: Giant pulmonary artery aneurysm

INTRODUCTION

Pulmonary artery aneurysm (PAA) is a rare defect with a 1:14,000 autopsy prevalence. These aneurysms may develop as a result of a number of different etiologies including Congenital heart disease (CHD), connective-tissue disorders, acquired vascular illness, cancer, trauma, iatrogenic causes, or in rare cases, idiopathic reasons. There are no gender preferences for PAAs, which often occur in younger age groups than aortic aneurysms [1]. Chest tightness, laboured breathing, hemoptysis, coughing, and chest discomfort are all clinical presentation of

PAA [2]. The aim of this study was to present a case report on Giant pulmonary artery aneurysm in a child.

CASE PRESENTATION

A 12-year-old child with a history of congenital cardiac disease in the form of patent ductus arteriosus (PDA) came with a fresh onset of exhaustion lasting three months. He was on a symptom based cardiac follow up following national recommendations, with no regular imaging. There was no relevant further medical or family history. A physical assessment indicated a healthy patient with normal vital signs. During auscultation, there was anterior chest bulging, as well as rumbling pathological diastolic and systolic murmurs along the right parasternal boundary spreading to the subxiphoid and apical areas. No signs of connective tissue disorders were seen. All laboratory tests, including a complete blood count, organ function tests, and d-dimer, were normal. HIV, TB, and syphilis screenings were negative. At presentation, a chest radiograph (CXR) revealed a smooth left hilar region opacity with a tight relationship to the left cardiac border, raising the likelihood of aneurysmal dilatation of the Pulmonary artery (Figure 1). A pericardial cyst and aneurysmal dilatation of the left atrium were among the possibilities. The transthoracic echocardiogram indicated no progression from the prior scan; there was a PDA and Pulmonary arterial hypertension (PAH), but no more information was obtained from the report. A chest computed tomography angiography (CTA) was indicated for conclusive diagnosis. The CTA showed that primary Pulmonary artery had a major aneurysm with a maximum diameter of 8.6 cm in addition to both branches had dilated to sizes of 3.4 and 2.9 cm for the right and left PA, respectively.

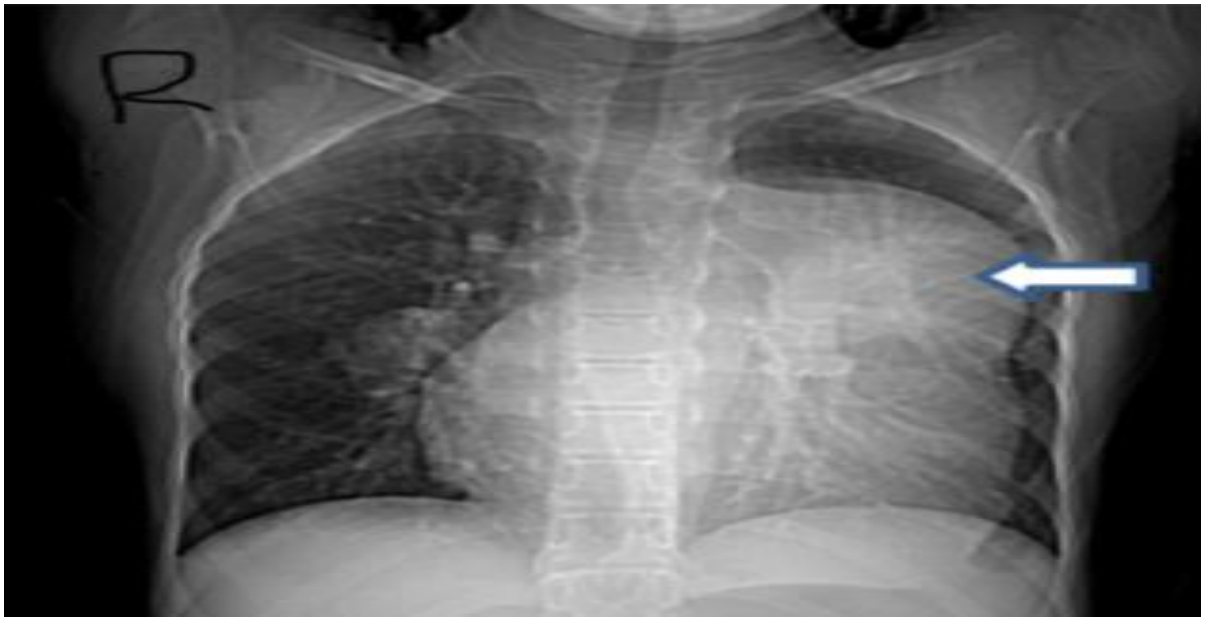

Figure 1- a chest radiograph (CXR) revealed a smooth left hilar region opacity

DISCUSSION

The current case report showed that CTA revealed a massive aneurysm of the pulmonary artery as well as dilatation. Similar to this case report Fan He et.al case report showed that CTA revealed pulmonary artery enlargement and pulmonary aneurysmal dilatation [(2)].

CONCLUSION

The current study concludes that "Giant PAAs produced by PDA are highly uncommon, lack an identifiable clinical manifestation, and are frequently discovered by chance during imaging. In the present case, a prompt accurate diagnosis was impeded by a lack of access to suitable cardiovascular imaging.

"Giant Pulmonary artery aneurysm produced by patent ductus arteriosus are highly uncommon, lack an identifiable clinical manifestation, and are frequently discovered by chance during imaging".

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