CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.1467401

Available online at: http://www.iajps.com Research Article

OBESITY ASSESSMENT IN CHILDREN HAVING SYSTOLIC & DIASTOLIC DISORDERS THROUGH PULSED WAVE DOPPLER & TISSUE DOPPLER IMAGING

[1]Javaeria Abdullah, [1]Maira Zafar, [2]Anum Farid
[1]Gujranwala Medical College
[2]Fatima Jinnah Medical University

Abstract:

Objective and Background: *The corpulence is increasing in today's era. There is not any confirmed the report to have cardiac problems in fat children. This factor can initiate a danger for the fat children.*

Materials and Methods: *We measured the blood pressure readings for any abnormality. Moreover, ECG results and cross-sectional research results for the study had carried out for the diagnosis of this problem. This research work included the children found with body mass index more than thirty and their healthy controls. Each group contains the twenty-five participants separated into cases of body mass index and healthy controls. CVD evaluation, ECG and echocardiography complied on every participant. PWD (Pulsed Wave Doppler) and TDI (Tissue Doppler Imaging) (TDI) were in action during echocardiography researches. We processed the collected information by using SPSS software.*

Results: *Age and gender helped in arranging both groups. High BP & resting heart discovered in the group of fat children with an important P value but the function of ejection was found same in all the participants of both groups. Last diastolic LV diameter, LVM (Left ventricular mass), last diastolic diameter, mass index LV, diameter rate of atrial to aortic were having important significant P values of 0.008, 0.0001, 0.0001 and 0.029. The high rate of the significance value showed an abnormality of systolic &diastolic. Diastolic abnormality found through fewer variables in the obese group except those who were aortic. An important variation found in the parameters of both categories. This research work also concluded the connection between the body mass index and its volumetric duration required for relaxation.*

Conclusions: *This research proved the connection between fat children without high blood pressure and subclinical systolic and diastolic abnormalities. Pulsed Wave Doppler and Tissue Doppler Imaging were compiled to evaluate the blood pressure to check the performance of a myocardial activity in the participants of fat children without high BP.*

Keywords: *ECG, TDI, PWD, cardiac, cardiomegaly, LV, LVM, CVD, controls.*

Corresponding author:
Javaeria Abdullah,
Gujranwala Medical College

QR code

Please cite this article in press Javaeria Abdullah et al., ***Obesity Assessment in Children Having Systolic & Diastolic Disorders through Pulsed Wave Doppler & Tissue Doppler Imaging.,*** *Indo Am. J. P. Sci, 2018; 05(10).*

INTRODUCTION:

The occurrence of fatness is increasing in the whole world. This also comprises confront of the fat children without the occurrence of the high BP and fatness is also deep-rooted in a population containing only adults. Whereas, there was no report found about any abnormality in the cardiac system in fat children. Interrogations about the medical variables in the obese children will be very beneficial in the future and will help in the detection of the main factors causing obesity [1]. New procedures are in use for the participants found with high risk as prophylaxis of CVD. Depression of the cardiac function could cause in the non-availability of hypertension. High body index and its severity are the main contributing factors of cardiac abnormality [2]. Two methods of echocardiography, Pulsed Wave Doppler and Tissue Doppler Imaging used for the evaluation of the functioning of the cardiac system in the obese participants.

MATERIALS AND METHODS:

This research completed at Services Hospital, Lahore (February to December 2017). Twenty-five participants having more than thirty bodies mass index included in the group of cases and twenty-five participants were the members of healthy controls. A strict evaluation of CVD assessment, echocardiography & ECG complied on every participant having the age five to fifteen years. Age and gender of the participants were similar in both groups. Measurement of the body mass index carried out with the help of Body Mass Index formula. The BMI formula is BMI = weight (kg)/height (m2). The participants provided the written willingness for the research.

First, heartbeat rate for one minute and BP of the right arm observed thrice for twenty minutes. If the blood pressure was more than a percentile of ninety-five then hypertension was confirmed. All the related tests carried out in the laboratory for the exact information about the participants [3]. Blood sugar and insulin evaluated after 12 hours of fasting. A special formula was in use for the measurement of HOMA‑IR. HOMA-IR formula is HOMA‑IR = insulin fasting (mIU/mL) multiplied with blood glucose fasting (mmol/L) and divided by 22.5. ECG, X-ray of chest and electrocardiography complied on all the participants of the research work. All the fat participants with ninety blood pressure percentile, body mass index greater than twenty-five and less than thirty, abnormalities in the thyroid, complications in the blood lipids, the low value of the ejection fraction, taking drugs against to decrease fitness and some other dangerous diseases were excluded from this research work.

ECG carried out for the evaluation of the systolic & diastolic function of the heart. SPSS software was in use for the analysis of statistical data. T-test was in use comparison of the age. Chi-square method was available for the gender distribution. Body mass index relation with the other aspects carried out with the help of Pearson's linear correlation coefficient.

RESULTS:

Gender and age were the same in both groups. High Bp was under consideration in the obese participants with significant P value but it was normal in the case of healthy controls. LVM, mass index of LV, end-diastolic diameter and last diastolic LV diameter was available with a remarkable P value. Diastolic abnormality discovered in the low value of the variables leaving aortic. We found a clear variation in the parameters of both types. This research work also concluded the relation between body mass index &isovolumetric repose time. The comparison of healthy controls and cases. Sixty-four percent participants were males in the cases and fifty-six percent in the healthy controls with an average age of (10.41 ± 3.52) & (9.92 ± 3.51) years respectively in both groups.

Table – I: Gender Distribution

Gender	Case Group	Control Group	P-Value
Male	0.64	0.56	0.564
Female	0.36	0.44	

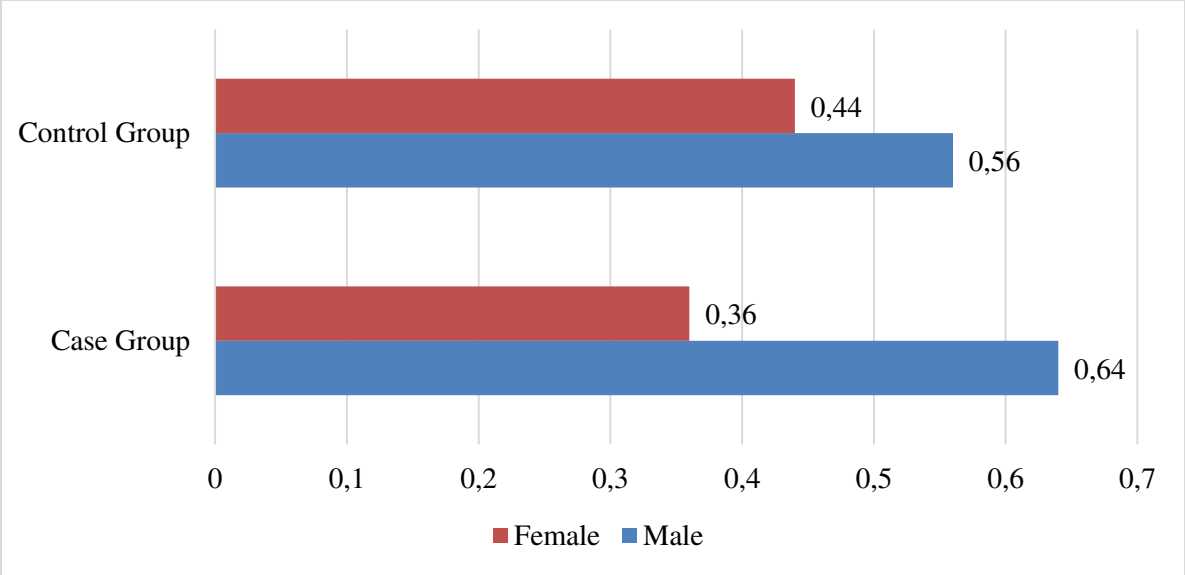


Table – II: Clinical and Echocardiographic Parameters

Details		Case Group		Control Group		P-value
		Mean	±SD	Mean	±SD	
Clinical Characteristics	BMI (kg/m^2)	33	1.75	18.68	2.048	0.0001
	HR (bpm)	89.2	7.44	82.24	6.62	0.0001
	SBP (mmHg)	130.4	6.6	119.16	7.08	0.0001
	DBP (mmHg)	84	6.29	74.52	5.12	0.0001
	Age	10.41	3.52	9.92	3.51	0.62
Echocardiographic Parameters	EF	69.1	2.16	69.64	2.12	0.381
	LA/AO ratio	1.39	0.08	1.21	0.07	0.0001
	LVM (g)	225.84	30.52	113.4	17.9	0.0001
	LVMI (g/m^2)	6.88	0.99	6.17	1.24	0.029
	LVEDD (mm)	44.4	2.4	41.9	3.8	0.008

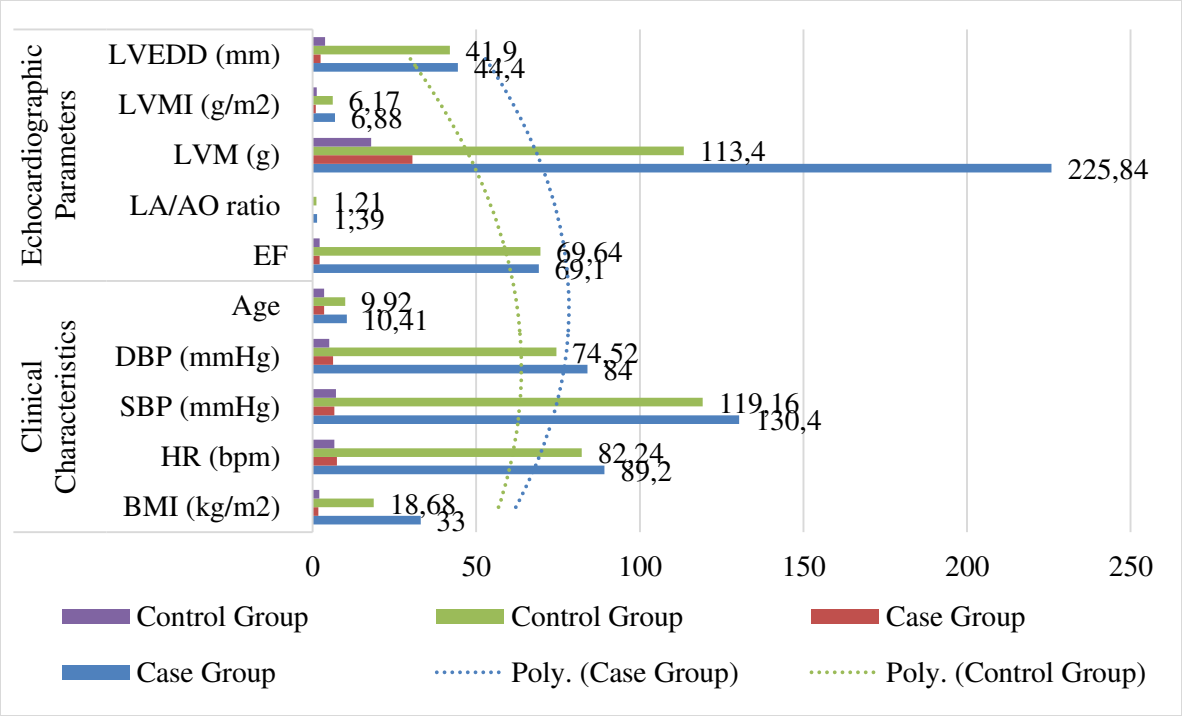


Table – III: Pulse Wave Doppler and Tissue Doppler Image Parameters

Details		Case Group		Control Group		P-value
		Mean	±SD	Mean	±SD	
Pulse Wave Doppler Parameters	**A (cm/s)**	84.44	9.32	95.84	21.27	0.02
	E (cm/s)	165.04	12.82	188.12	15.5	0.0001
	E/A	1.61	0.22	1.99	0.65	0.009
	Aortic velocity (m/s)	1.21	1.04	1.09	0.09	0.56
Tissue Doppler Image Parameters	**Sm (cm/s)**	9.86	0.59	10.82	1.21	0.001
	Em (cm/s)	18.28	0.75	16.3	1.66	0.0001
	Am (cm/s)	6.98	0.43	10.01	1.09	0.0001
	Em/Am	2.63	0.241	1.64	0.174	0.0001
	E/Em	5.42	0.43	6.28	0.62	0.0001
	IVRT (ms)	77.94	6.61	58.08	12.15	0.0001
	DI	0.35	0.04	0.31	0.05	0.002
	S-VTI (cm)	1.85	0.12	1.8	0.21	0.25
	L_0 (cm)	5.38	0.63	5.95	0.7	0.004

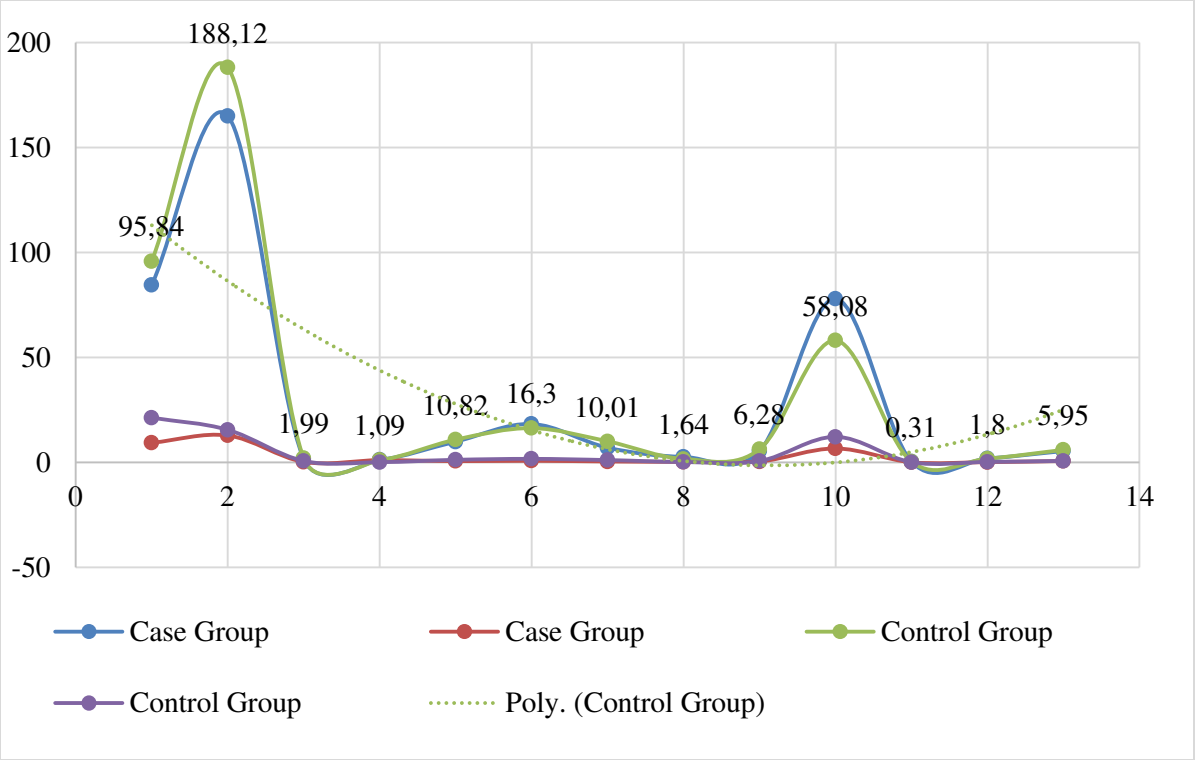
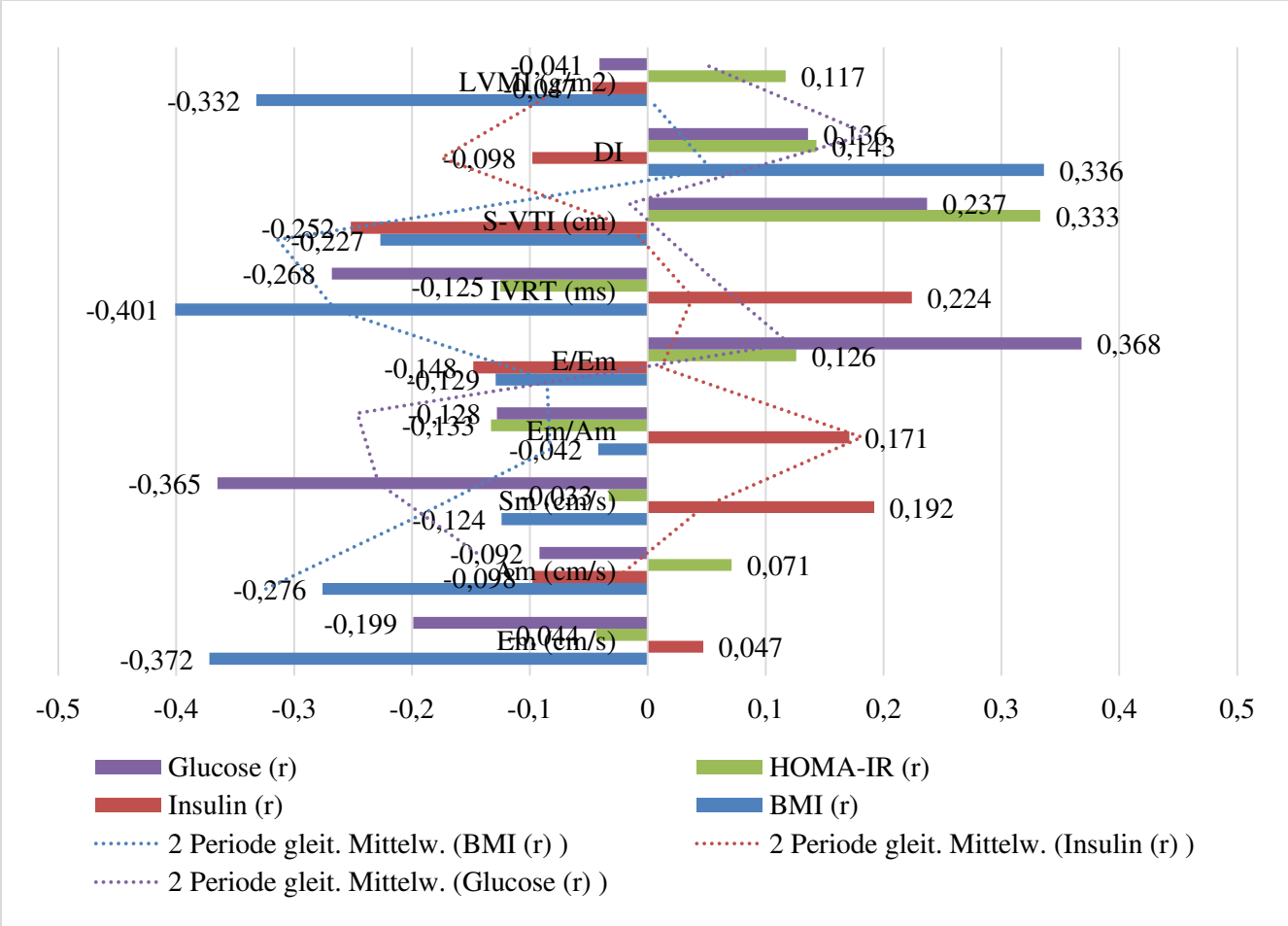


Table – IV: Pearson's Correlations

Details	BMI (r)	Insulin (r)	HOMA-IR (r)	Glucose (r)
Em (cm/s)	-0.372	0.047	-0.044	-0.199
Am (cm/s)	-0.276	-0.098	0.071	-0.092
Sm (cm/s)	-0.124	0.192	-0.033	-0.365
Em/Am	-0.042	0.171	-0.133	-0.128
E/Em	-0.129	-0.148	0.126	0.368
IVRT (ms)	-0.401	0.224	-0.125	-0.268
S-VTI (cm)	-0.227	-0.252	0.333	0.237
DI	0.336	-0.098	0.143	0.136
LVMI (g/m^2)	-0.332	-0.047	0.117	-0.041



The parameters of Pulsed Wave Doppler echocardiography. No remarkable difference discovered in both groups. The diastolic abnormality was available in the participants who were found without hypertension.

DISCUSSION:

We found a balanced increase in this research about the individuals suffering from fatness. The significance of the evidence is obliged for a change in the lifestyle and programs about the reduction of the weight. The condition of normal BP with fatness is exceptional [4]. The complications of high BP increase in the sugar level, coronary diseases and Left ventricular hypertrophy and the abnormalities of the cardiac system are the common results of obesity [5]. Hypertension discovered in obese adult patients. Scarce data was in use for the identification of the upper and lower limit of blood pressure in fat children. The cardiac syndrome cases are the result of high sugar, resistance against the insulin and impaired mental system [6].

The obese participants were prevalent with the high beat rate of heart in comparison to their healthy controls. We did not find any medical myocardial depression in any case [7]. Blood pressure and beat rate of heart were under evaluations on regular basis for the detection of hypertension in the obese children participating in this research. Previous research works were using ECG for the assessment of blood pressure but Pulsed Wave Doppler and Tissue Doppler Imaging are the new procedures used in this research work [8]. A remarkable rise in the fat children was assessed in the volume of the cardiac system and ECG showed systolic which was not recorded earlier [9].

The control children found with moderate BP level and high Left ventricular mass [10]. The increase in the Left ventricular mass is the main cause of abnormality in the systolic & diastolic. There is a close relation among Left ventricular mass, LVMI and body mass index including the evaluations carried out in the laboratory. The amount of the LVEDD was high in the fat children [11]. The

disparity on the S-VTI was difficult to identify in this research work [12, 13]. This research work also proved the connection between the body mass index and HR [14]. We found no connection among the parameters discovered in laboratory, DI and body mass index.

We found some deformation in the participants having more than thirty body mass index before the start of this research work [15]. Pulsed Wave Doppler and Tissue Doppler Imaging were in use to identify the abnormalities of diastolic & systolic. The malfunctioning of the subclinical diastolic & systolic was in consideration in the fat Participants with no rise in blood pressure [16]. The outcome of this research proved that there is a connection between body mass index and IVRT but we found no relation among glucose, insulin and HOMA‑IR including Pulsed Wave Doppler and Tissue Doppler Imaging ECG.

HOMA‑IR abnormality discovered before the emergence of high blood sugar [17]. The age of puberty and sex, also hinder the effect of insulin and fatness. In this matter, male were the leading figures [18]. There are many abnormalities, which are the direct outcome of the [19]. The small size of the participants was the main limitation of this research work, so other research works are in need to prove the authenticity of this research work [20]. Another shortcoming of this research work was the long checkups for the measurement of the weight of participants. It is a compulsion to monitor the blood pressure for consecutive twenty-four hours.

CONCLUSIONS:

We found a clear connection between the fate of children without high BP and participants found with subclinical systolic and diastolic abnormalities. Pulsed Wave Doppler and Tissue Doppler Imaging methods used for the evaluation of high BP in the target participants of fat children without hypertension yielded satisfactory results.

REFERENCES:

1. Dias, K.A., et al., Left ventricular morphology and function in adolescents: Relations to fitness and fatness. International journal of cardiology, 2017. 240: p. 313-319.
2. Patrascu, N., et al., P3256Pregnant women with gestational hypertension or preeclampsia had lower global and regional left ventricular systolic function by comparison with normotensive pregnant women. European Heart Journal, 2017. 38 (suppl_1).
3. Beltrami, M., et al., The importance of integrated left atrial evaluation: From hypertension to heart failure with preserve dejection fraction. International journal of clinical practice, 2017.
4. Castleberry, C.D., et al., No Obesity Paradox in Pediatric Patients with Dilated Cardiomyopathy. JACC: Heart Failure, 2018.6(3): p. 222-230.
5. Maiello, M., et al., Left ventricular mass, geometry and function in diabetic patients affected by coronary artery disease. Journal of diabetes and its complications, 2017.31(10): p. 1533-1537.
6. Wang, Q., et al., Association of pulse pressure with left ventricular geometry and function in elderly non-hypertensive patients with diabetes: A 3D speckle tracking echocardiography study. Journal of Clinical Ultrasound, 2017. 45(7): p. 416-425.
7. Bonapace, S., et al., Early impairment in left ventricular longitudinal systolic function is associated with an increased risk of incident atrial fibrillation in patients with type 2diabetes. Journal of diabetes and its complications, 2017. 31(2): p. 413-418.
8. Ingul, C.B., et al., Effect of High Intensity Interval Training on Cardiac Function in Children with Obesity: a Randomised Controlled Trial. Progress in cardiovascular diseases, 2018.
9. Rumman, R.K., et al., Cardiovascular Structure and Function in Children with Middle Aortic Syndrome and Renal Artery Stenosis Novelty and Significance. Hypertension, 2017. 70(6): p. 1193-1200.
10. Ye, Z., P.A. Pellikka, and I.J. Kullo, Sex differences in associations of cardio-ankle vascular index with left ventricular function and geometry. Vascular Medicine, 2017.22(6): p. 465-472.
11. Caterini, J., et al., Magnetic resonance imaging reveals elevated aortic pulse wave velocity in obese and overweight adolescents. Clinical obesity, 2017. 7(6): p. 360-367.
12. El Saiedi, S.A., et al., Left ventricular diastolic dysfunction without left ventricular hypertrophy in obese children and adolescents: a Tissue Doppler Imaging and Cardiac Troponin I Study. Cardiology in the young, 2018. 28(1): p. 76-84.
13. Zemrak, F., et al., Left Atrial Structure in Relationship to Age, Sex, Ethnicity, and Cardiovascular Risk Factors Clinical Perspective: MESA (Multi-Ethnic Study of Atherosclerosis). Circulation: Cardiovascular Imaging, 2017. 10(2): p.e005379.
14. Ghelani, S.J., et al., Left Atrial Volumes and Strain in Healthy Children Measured by Three-Dimensional Echocardiography: Normal Values and Maturational Changes. Journal of the

American Society of Echocardiography, 2018. 31(2): p. 187-193.e1.
15. Kulkarni, A., et al., Left ventricular remodeling and vascular adaptive changes in adolescents with obesity. Pediatric obesity, 2018.
16. Yang, H., et al., Associations of childhood and adult obesity with left ventricular structure and function. International Journal of Obesity, 2017. 41(4): p. 560.
17. Zemrak, F., et al., Left Atrial Structure in Relationship to Age, Sex, Ethnicity, and Cardiovascular Risk Factors: MESA (Multi-Ethnic Study of Atherosclerosis). Circulation. Cardiovascular imaging, 2017. 10(2).
18. Ghandi, Y., et al., Evaluation of left ventricular function in obese children without hypertension by a tissue Doppler imaging study. Annals of Paediatric Cardiology, 2018.11(1): p. 28.
19. Mehta, S., et al., Arterial Thickness and Stiffness Are Independently Associated with Left Ventricular Strain. Journal of the American Society of Echocardiography, 2018. 31(1): p. 99-104.
20. De Marco, M., et al., Influence of left ventricular stroke volume on incident heart failure in a population with preserved ejection fraction (from the strong heart study). American Journal of Cardiology, 2017. 119(7): p. 1047-1052.