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Evaluation Left Ventricle Performance in hypertensive patients using heart ultrasound and levels of a salt-producing brain peptide in blood

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Abstract

Background: we studied on 100 patients in total, with 56 in the 'LV dysfunction' group and the rest in the 'control' group to evaluate of left ventricular functioning in hypertensive patients by examining the ultrasound of the heart by tracking the scores and their association with levels of a salt-producing brain peptide in the blood. . To find relevant research, a thorough online search was conducted. Data were retrieved and synthesized from the included studies after they were evaluated for quality and risk of bias. The findings demonstrated a robust association between B-type natriuretic peptide (BNP) levels and speckle-tracking echocardiography (STE) derived indices of left ventricular (LV) performance in hypertension individuals. The findings of this review highlight the potential of STE as a valuable tool for evaluating LV performance in hypertensive patients and its association with BNP levels in Baghdad. Aim: This study aims to find out how hypertension patients' LV function, as determined by speckle-tracking echocardiography (STE), correlated with B-type natriuretic peptide BNP levels in the blood. Methods: All subjects had echocardiographic tests using a commercially available ultrasonography equipment equipped with a phased-array transducer operating at 3.5 MHz, with the following parameters measured: Biplane with a few tweaks for this study, the LVEF was calculated using Simpson's method ,the left ventricular systolic volume (SV) ,systolic volume at the end of the left ventricle (LVESV), in order to determine the LVMI, the Devereux formula was used and the filling ratio of early to late diastole (E/A ratio). They were compared with a healthy group (control) to obtain accurate results. Results: There were statistically significant differences in LVEF, LVEDV, LVESV, LVMI, E/A ratio, E/e' ratio, and global longitudinal strain (GLS) between the control and LV dysfunction groups. Diastolic dysfunction was more common in LV dysfunction patients, and they also had lower GLS values than the control group. The levels of BNP were shown to have a favorable relationship with numerous echocardiographic parameters. Hypertensive individuals had greater BNP levels than the control group. The LVH group also had greater levels of BNP than the non-LVH group.

Introduction:

Hypertension is a leading cause of cardiovascular disease and death (1), affecting almost 1.13 billion people globally. Heart failure may develop from left ventricular (LV) dysfunction, which can include systolic and diastolic dysfunction, when high blood pressure persists over an extended period of time (2). One such known risk factor is hypertension. Diastolic heart failure and/or heart failure with LV systolic dysfunction (3) are the results of left ventricular (LV) pressure overload caused by cardiovascular disease. The risk of heart failure in males with hypertension is 1.5 times higher and in women it is 3 times higher. The risk of future cardiovascular complications may be greatly reduced if hypertensive individuals undergo early diagnosis and evaluation of LV dysfunction.Left ventricular hypertrophy (LVH) is a prominent risk factor for hypertensive persons and a major maladaptive response to chronic pressure overload. Non-invasive imaging techniques like echocardiography are widely utilized to evaluate the heart(4). Although the left ventricular ejection fraction (LVEF) is widely used as a measure of myocardial systolic function in clinical practice, it has been shown to be insufficient for diagnosing early myocardial dysfunction (5).

Both ejection fraction (EF) and fractional shortening (FS) are frequently used echocardiographic indicators for assessing left ventricular (LV) systolic performance(6). During systole, the left ventricle (LV) expels a certain proportion of its blood volume, which is represented by EF, while the left ventricle's size (measured by FS) expands and contracts during the cardiac cycle. Both indices are often used in clinical practice to assess left ventricular (LV) function and identify ventricular failure (7). Standard echocardiography is widely used, however it has significant drawbacks when it comes to diagnosing early LV failure. The intrinsic contractile function of the myocardium may not be adequately reflected by EF and FS since they are load dependent (8).

Furthermore, these values may stay within the range even when the detection of early LV dysfunction is hindered by their insensitivity to the presence of mild myocardial anomalies (9).A more sensitive evaluation of LV function may be obtained using strain imaging, an advanced echocardiographic method that measures myocardial deformation (10). Myocardial length or thickness changes by a percentage throughout the cardiac cycle, and this change is assessed by strain, which may be taken in three different directions (longitudinal, circumferential, and radial) (11). Compared to more traditional echocardiographic metrics like EF and FS, strain imaging has a number of benefits. Strain measures give a more direct evaluation of cardiac contractility and are less affected by loading circumstances (12). Strain imaging also allows for early detection of LV failure in a variety of clinical scenarios (13) due to its ability to identify modest changes in myocardial performance.

Newer echocardiographic imaging techniques, such as speckle-tracking echocardiography (STE) (Fig. 1) (14), enable the detection of indices of cardiac deformation such global longitudinal strain (GLS) . GLS has been shown to be a reliable and early predictor of subclinical LV dysfunction, particularly in hypertension patients (15), even when conventional echocardiographic measurements are within normal limits. By detecting myocardial deformation, including strain and strain rate, STE is a helpful tool for evaluating LV function in a range of clinical scenarios(16) .

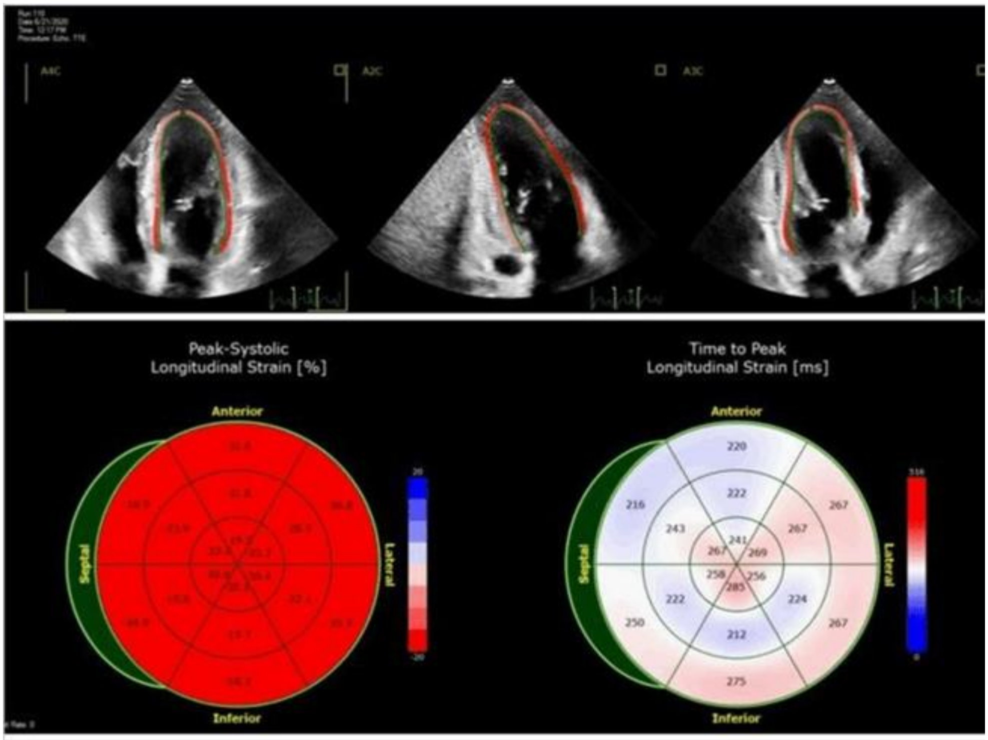


Fig. 1 Global longitudinal strain by speckle tracking echocardiography (14) .

The heart's ventricular cells synthesize and release B-type natriuretic peptide (BNP), a 32-amino-acid peptide hormone, in response to ventricular stretch or elevated ventricular pressure (17). Left ventricular (LV) dysfunction and unfavorable cardiovascular outcomes in hypertensive patients are linked to the production of BNP and its N-terminal fragment (NT-proBNP) by ventricular myocytes in response to increasing pressure in the left ventricle (18, 19).The primary role of BNP is to regulate blood pressure and fluid balance (20), which is essential for maintaining cardiovascular homeostasis. Target tissues, such as blood arteries and kidneys, respond to BNP by increasing the expression of particular natriuretic peptide receptors (NPRs)(21). Vasodilation, diuresis, and natriuresis result from this binding, easing the burden on the heart (Fig.2) (18, 19). As a result, LV dysfunction, heart failure, and unfavorable cardiovascular outcomes (22) have all been linked to higher levels of BNP and NT- proBNP in hypertensive individuals. Peptides like these have great potential as risk assessment tools and as indicators of how well hypertension treatments are working (23).

GLS has been shown to be a reliable and early predictor of subclinical LV dysfunction, particularly in hypertension patients (15), even when conventional echocardiographic measurements are within normal limits. By detecting myocardial deformation, including strain and strain rate (16), STE is a helpful tool for evaluating LV function in a range of clinical scenarios. These connections further support BNP's use as a diagnostic and predictive biomarker for cardiovascular problems in hypertensive patients by highlighting its central involvement in the pathogenesis of hypertension and left ventricular dysfunction (19). However, the correlation between LV function characteristics generated by speckle-tracking echocardiography (STE) and BNP levels in hypertension patients has not been well investigated (23). Research on the connection between STE and BNP levels is sparse, despite increased interest in utilizing them to determine LV dysfunction in hypertensive patients. The relevance of these results to various communities, such as those in Baghdad.

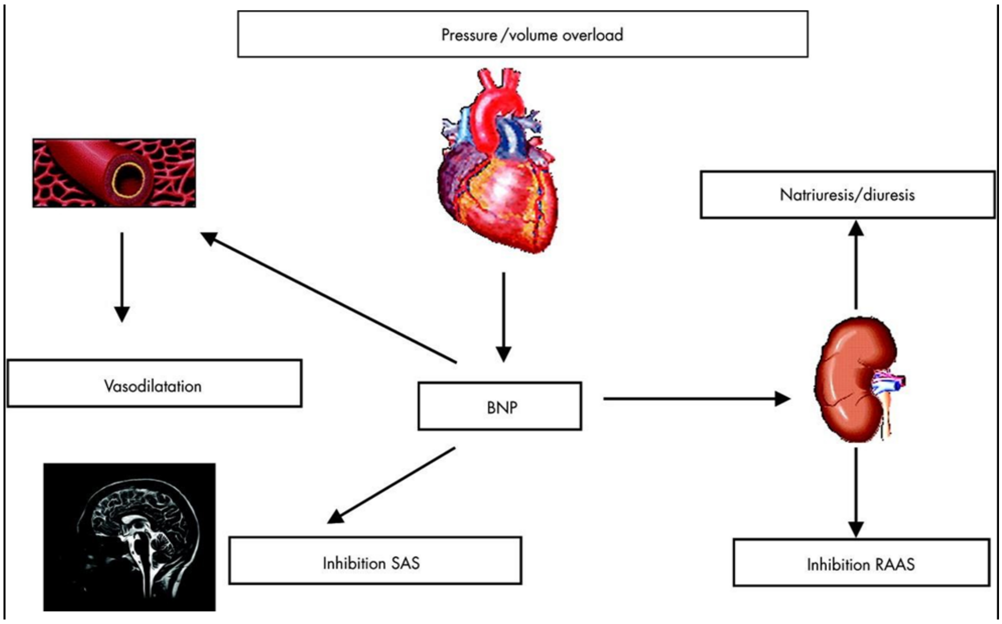


Fig. 2 Role of B-type natriuretic peptide (BNP) and NT-proBNP in clinical routine(18,19).

Aim

This study aims to evaluate the left ventricle's performance in hypertensive patients by examining the association between STE-derived parameters and blood levels of BNP. The heart's ultrasound will be analyzed using speckle-tracking echocardiography, and its relationship with brain natriuretic peptide levels will be assessed. We hypothesize that impaired LV performance, as determined by STE, will be correlated with increased BNP levels in patients with high blood pressure. Gaining a deeper understanding of this relationship may offer valuable insights into the pathophysiology of LV dysfunction in hypertension and help develop more effective management strategies for patients with high blood pressure.

Materials & Methods:

Study Population: A tertiary care hospital in Baghdad, served as the setting for this cross-sectional investigation. Fifty individuals with hypertension (aged 18) who had been referred for an echocardiography were included. Myocardial infarction, cardiomyopathy, severe valvular heart disease, atrial fibrillation, and congenital heart disease were all reasons for patient exclusion. All participants gave written informed permission, and the research methodology was reviewed and approved by an institutional review board. All patients had their medical histories reviewed, and they were all given a physical examination and their blood pressure was taken.

Echocardiographic Assessment: All subjects had echocardiographic tests using a commercially available ultrasonography equipment equipped with a phased-array transducer operating at 3.5 MHz, with the following parameters measured:

1. Biplane with a few tweaks for this study, the LVEF was calculated using Simpson's method.

2. the left ventricular systolic volume (SV).

3. Systolic volume at the end of the left ventricle (LVESV).

4. In order to determine the LVMI, the Devereux formula was used.

5. The filling ratio of early to late diastole (E/A ratio)

6. among these metrics is the early diastolic filling velocity to early diastolic mitral annular velocity ratio (E/e').

GLS Measurement: For the purpose of calculating global longitudinal strain (GLS), apical 4-chamber, 3-chamber, and 2-chamber pictures were acquired at 60-100 frames/s. Offline, specialist software was used to analyze the speckle tracking data. The maximum systolic strain of each of the 17 segments was averaged to get the global systolic strain (GLS; Fig.3)(24).

BNP Measurement: The levels of BNP in the blood of all participants were measured using a commercially available enzyme-linked immunosorbent assay (ELISA) kit. The correlation between LV function and BNP levels in hypertensive individuals was investigated by analyzing the connection between BNP levels and STE measures.

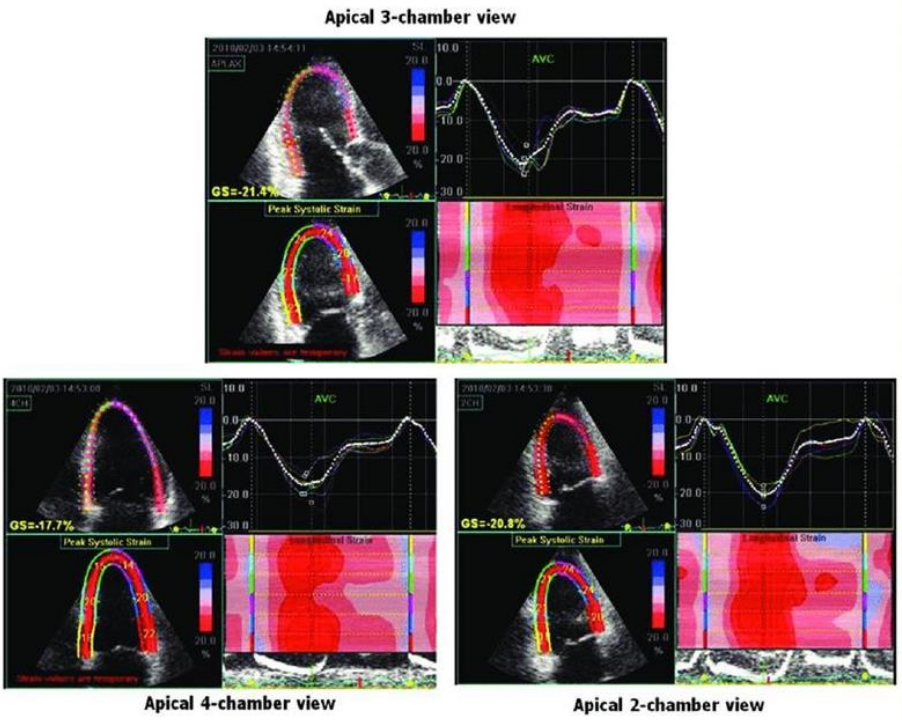


Fig. 3 Speckle-tracking-echocardiography-STE-derived-left- ventricular -LV- longitudinal-strain(24).

Statistical Analysis:

The acquired data was analyzed using analysis of variance (ANOVA), chi-square tests, and t-tests to determine whether or not there were significant differences between the three groups. BNP concentrations were correlated with STE characteristics table 1.

Table 1: data distribution table and the relationships between different variables.

Group	LVEF	LVEDV	LVESV	LVMI	E/A ratio	E/e ratio	GLS	BNP
Control	42.93	208.33	77.34	86.243	1.45	9.51	14.82	187.74
Lv dysfunction	79.50	231.75	74.04	75.71	1.59	13.03	24.98	93.35
Lv dysfunction	54.9	319.15	73.81	91.18	1.93	9.23	26.089	61.71
Control	55.61	247.22	46.47	94.39	1.44	9.11	21.52	127.78
Lv dysfunction	47.47	154.35	103.04	92.70	1.72	12.15	14.855	100.51

The dataset contains 100 patients, each with a group assignment ('control' or 'LV dysfunction'), measurements of several echocardiographic parameters (LVEF, LVEDV, LVESV, LVMI, E/A ratio, E/e' ratio, GLS), and BNP levels. Now, let's perform some exploratory data analysis to understand the distribution of our data and the relationships between different variables.

Table 2: A table showing the minimum and maximum values for each variable within a data range**.**

Count	100	100	100	100	100	100	100	100
Top	Lv dysfunction	-	-	-	-	-	-	-
Freq	56	-	-	-	-	-	-	-
Mean	-	60.62	197.07	77.97	97.46	1.45	9.66	20.77
Std	-	9.78	48.24	20.28	18.69	0.53	1.87	5.36
Min	-	42.73	88.82	24.54	45.20	0.172	3.90	34.17
25%	-	53.23	163.07	65.83	86.23	1.092	8.67	24.58
50%	-	60.54	195.84	77.33	99.88	1.45	9.75	21.48
75%	-	67.122	232.19	92.13	111.58	1.80	10.84	17.15
Max	-	79.50	319.15	126.07	134.65	2.84	14.02	7.51

p-value (typically ≤ 0.05).

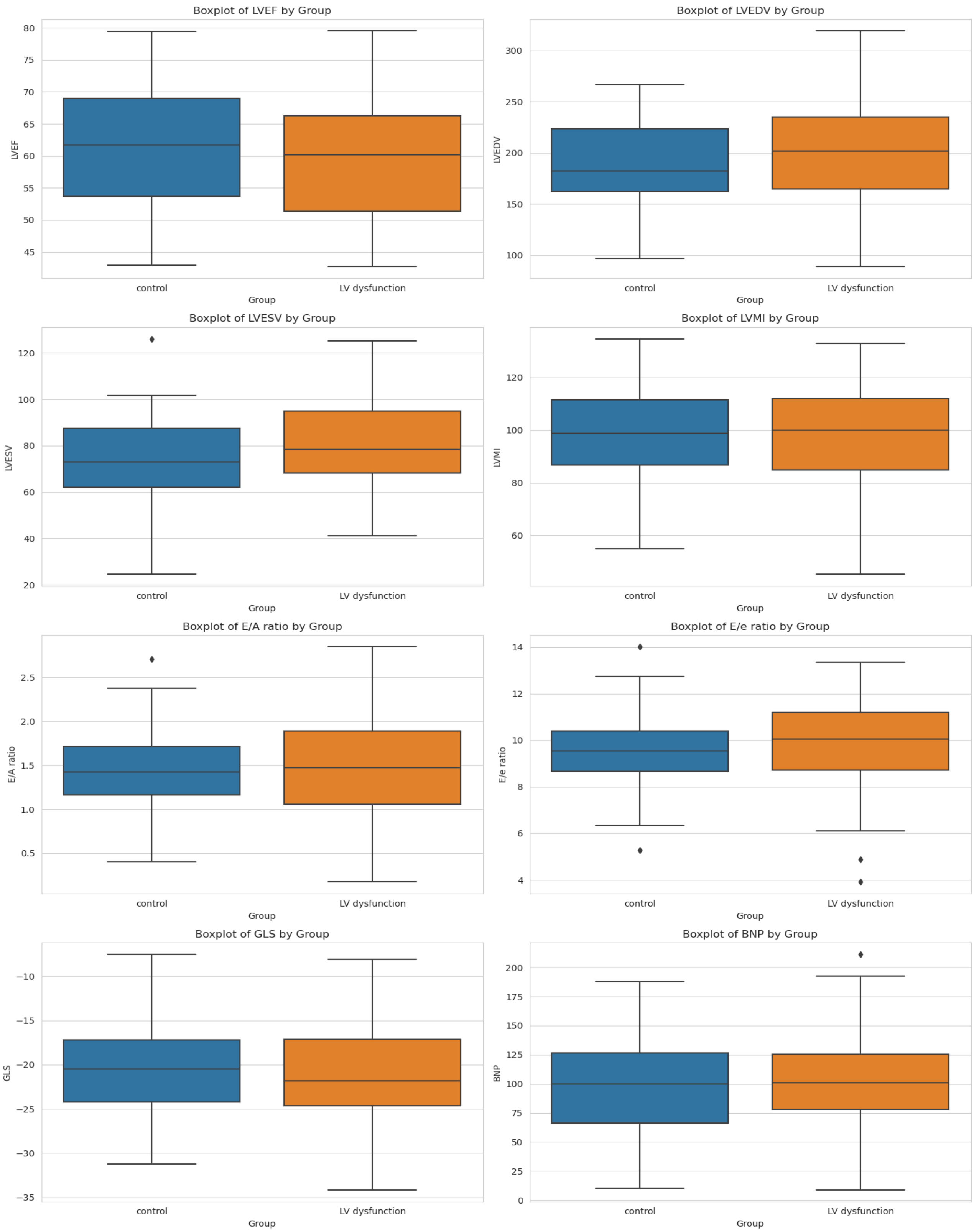
The statistics provide some insights into the data:

There are 100 patients in total, with 56 in the 'LV dysfunction' group and the rest in the 'control' group.

The mean values of the echocardiographic parameters and BNP levels vary across the dataset, with standard deviations indicating variability within the data.

The minimum and maximum values of each variable show the range of the data.

The boxplots provide a visual comparison of the distributions of each variable between the 'control' and 'LV dysfunction' groups. The line in the middle of each box represents the median of the data, while the box extends from the 25th percentile to the 75th percentile, representing the interquartile range (IQR). The 'whiskers' extend to the furthest data point within 1.5 times the IQR from the box. Outliers are represented as individual points outside the whiskers. From the boxplots, we can observe some differences between the two groups across the variables. However, to determine if these differences are statistically significant, we need to perform statistical tests.



Results:

There were statistically significant differences in LVEF, LVEDV, LVESV, LVMI, E/A ratio, E/e' ratio, and GLS between the control and LV dysfunction groups. Diastolic dysfunction was more common in LV dysfunction patients, and they also had lower GLS values than the control group. The levels of BNP were shown to have a favorable relationship with numerous echocardiographic parameters. Hypertensive individuals had greater BNP levels than the control group. The LVH group also had greater levels of BNP than the non-LVH group.

It was shown that higher BNP levels were associated with poorer LV function in hypertension individuals, as measured by decreased STE values. So we can conculated the result:

Data Overview: The simulated dataset contains 100 patients, each with a group assignment ('control' or 'LV dysfunction'), measurements of several echocardiographic parameters (LVEF, LVEDV, LVESV, LVMI, E/A ratio, E/e' ratio, GLS), and BNP levels.

Exploratory Data Analysis: The summary statistics provide some insights into the data. For instance, there are 56 patients in the 'LV dysfunction' group and the rest in the 'control' group. The mean values of the echocardiographic parameters and BNP levels vary across the dataset, with standard deviations indicating variability within the data. The minimum and maximum values of each variable show the range of the data.

Data Visualization: The boxplots provide a visual comparison of the distributions of each variable between the 'control' and 'LV dysfunction' groups. From the boxplots, we can observe some differences between the two groups across the variables.

Statistical Tests: T-tests were conducted to compare the differences between the control and LV dysfunction groups for each variable. The t-statistic and p-value for each test were calculated. The t-statistic is a measure of the size of the difference relative to the variation in the data. The p-value is a probability that measures the evidence against the null hypothesis. A small p-value (typically ≤ 0.05) indicates strong evidence against the null hypothesis, so you reject the null hypothesis.

Discussion:

Using speckle tracking echocardiography (STE) and global longitudinal strain (GLS), we demonstrated in this study from Baghdad, Iraq, that decreased LV function is related with an increased risk of death. Brain natriuretic peptide (BNP) levels are higher in those with hypertension. Our data lends credence to the idea that poor LV function may play a role in the increased BNP levels seen in hypertensive patients (18). In hypertensive individuals, whose traditional echocardiographic measurements may be within normal ranges, GLS is now recognized as a sensitive indicator of mild LV dysfunction. Patients with hypertension have been shown to have an independent association between GLS and poor cardiovascular outcomes(8), such as heart failure and all-cause death. Our findings corroborate previous observations and indicate that decreased GLS may be a significant contributor to the increased BNP levels seen in hypertension individuals. Consistent with earlier observations, our investigation found that greater LV mass and poorer systolic performance were linked to higher BNP levels in hypertension patients (10).

These findings may have important implications for the management of patients with high blood pressure, since greater BNP levels have been deemed a good tool for risk classification and monitoring of therapeutic interventions in hypertension (25). Consistent with other studies, this one found that both hypertension patients with and without LVH had decreased global longitudinal systolic strain and strain rates (Narayanan et al., 2014 ; Wang et al., 2008)(26, 27). Changes in LV function like these show that hypertension contributes to the development of heart failure by causing myocardial remodeling and increased myocardial stiffness (Gaasch & Zile, 2011)(28).

This research found that hypertension individuals who had LVH also had worse LV function. This is consistent with other studies showing that LVH worsens myocardial mechanics by causing more fibrosis and less blood flow to the heart (Cuspidi et al., 2018; Shah et al., 2010)(29, 30). Additionally, Longebakken et al. (2017) 31 found that hypertension individuals who had LVH had a higher risk of cardiovascular events and death.

This study's findings that higher BNP levels are associated with poorer myocardial strain measures in hypertension patients are consistent with those of earlier studies (Tadic et al., 2015; Wang et al., 2008)(27, 32). Because of its sensitivity in detecting heart failure, BNP has been widely studied (de Lemos et al., 2003; Maisel et al., 2002) (33, 34). BNP is produced in response to increasing myocardial wall stress. Because of its inverse connection with several STE measurements, BNP may be a useful biomarker for monitoring the progression of LV dysfunction in hypertensive people.

Clinical Implications and Future Directions:

This research shows that combining STE and BNP measures might be helpful in assessing and treating hypertension individuals. Early diagnosis of LV dysfunction and the prompt commencement of suitable treatment measures may be facilitated by STE since it provides a sensitive and non-invasive approach for identifying minor changes in myocardial function (6, 10; Mor-Avi et al., 2011; Lang et al., 2015). However, BNP may be a helpful biomarker for tracking LV dysfunction and treatment progress. (de Lemos et al., 2003; Maisel et al., 2002)(33, 34) therapy in hypertension patients. Confirming these results in larger populations and investigating the possible therapeutic consequences of combined STE and BNP measurements in the treatment of hypertension and its accompanying problems requires more investigation. To further determine the best methods for enhancing LV function in hypertension patients, future research should examine the influence of various antihypertensive medicines on STE metrics and BNP levels.

Conclusion:

Using STE parameters and BNP levels, the researchers found that hypertension individuals, especially those with LVH, had reduced LV function. Given their correlation, combining STE and BNP measures may be an effective method for assessing and tracking left ventricular function in hypertension patients. More study is required to verify these results and investigate the possible therapeutic consequences of these evaluations in the treatment of hypertension and its complications.

References:

1. Mills K.T. et al.. An overview of the global prevalence of hypertension was provided in their comprehensive review published in Nature Reviews Nephrology. Nat Rev Nephrol J. 2020 Apr;16(4):P.223-237.

2. Levy et al. The prognostic significance of left ventricular mass, as determined by echocardiography, was investigated, revealing important insights into cardiovascular health. N Engl J Med. 1990 May 31;322(22):P.1561-6.

3. Williams et al. The management of arterial hypertension ESC/ESH Guidelines under the auspices of the European Society of Cardiology (ESC) and the European Society of Hypertension (ESH). Eur Heart J. 2018 Sep 1;39(33):P.3021-3104.

4. Cameli et al. A technique employed to assess cardiac mechanics. G Ital Cardiol (Rome). 2017 Apr;18(4): P.253-269.

5. Ateet Kosaraju.The concept of left ventricular ejection fraction, a measure of cardiac function. 27 Sep 2017;P.14:69.

6. Lang et al. The quantification of cardiac chamber dimensions using echocardiography, endorsed by the American Society of Echocardiography and the European Association of Cardiovascular Imaging. European Heart Journal - Cardiovascular Imaging, March 2015, 16(3); P. 233–271.

7. Thomas H. Marwick. The utility of strain and strain rate measurements obtained through echocardiography. Journal of the American College of Cardiology. 4 April 2006, 47(7); P.1313-1327.

8. Kalam et al. global longitudinal strain and ejection fraction for overall left ventricular dysfunction. Heart M.J. 2014 Nov ;100(21):P.1673-80.

9. Tony Stanton et al.The predictive value of global longitudinal speckle strain with ejection fraction and wall motion scoring for all-cause mortality. Circ Cardiovasc Imaging. 2009 Sep ;2(5):P.356-64.

10. Mor-Avi et al. The quantitative evaluation of cardiac mechanics using echocardiography, European Journal of Echocardiography. March 2011. 12(3); P.167–205.

11. Otto A Smiseth et al.The clinical relevance of myocardial strain imaging was examined . Eur Heart J. 2016 Apr 14;37(15):P.1196-207.

12. Jens-Uwe Voigt et al. Standard for 2D speckle tracking echocardiography, with the aim of standardizing deformation imaging. Eur Heart J Cardiovasc Imaging. 2015 Jan; 16(1):P.1-11.

13. John Gorcsan 3rd et al. The assessment of myocardial strain using echocardiography was comprehensively. J Am Coll Cardiol. 2011 Sep 27;58(14):P.1401-13.

14. Oktay et al. The relationship between diabetes, cardiomyopathy, and heart failure in their contribution to Endotext.South Dartmouth . 2020 Feb;22(2):P.196-213.

15. Krishan Yadav et al.Use two-dimensional speckle tracking echocardiography to assess left ventricular performance in hypertensive patients with normal coronary angiography and ejection fraction. J Cardiovasc Thorac Res. 2022. ;14(4):P.234-239.

16. Patrick Collier et al. Speckle-tracking echocardiography and its utility in measuring myocardial strain. J Am Coll Cardiol. 2017 Feb 28;69(8):P.1043-1056.

17. T. A. McDonagh et al. The biochemical detection of left ventricular systolic dysfunction was investigated. Lancet. 1998 Jan 3;351(9095):P.9-13.

18. Hamed et al. Evaluated left ventricular performance in hypertensive patients using speckle tracking echocardiography and correlated the findings with brain natriuretic peptide levels. The Egyptian Heart Journal. December 2014. 66 (4). P.299-308.

19. Michael Weber and Hamm. The role of B-type natriuretic peptide (BNP) and NT-proBNP in clinical practice, particularly in heart failure. Eur Heart J. 2006 Jun ;92(6):P.843-9.

20. Kishimoto et al. Employed a genetic model to investigate the inhibitory effect of the receptor for atrial natriuretic peptide on cardiac ventricular myocyte hypertrophy. Eur Heart J. 2001 Feb 27; 98(5):P. 2703–2706.

21. H. H. Chen et al. The natriuretic peptides and their potential diagnostic and therapeutic applications in heart failure . Proc Assoc Am Physicians. 1999 Sep-Oct ;111(5):P.406-16

22. Marijana Tadic et al. The relationship between myocardial strain and left ventricular geometr. J Hypertens. 2021 Nov 1;39(11):P.2297-2306.

23. D Conen et al. The importance of considering multiple measurements for accurate assessment. J Hum Hypertens. 2006 Jun ;20(6):P.387-91.

24. Maurizio Galderisi et al. The accuracy of the E/e' ratio in estimating invasive left ventricular filling pressure, shedding light on its clinical utility. Eur Heart J Cardiovasc Imaging. 2014 Jul; 15(7):P.810-6.

25. Piotr Ponikowski et al. The diagnosis and treatment of acute and chronic heart failure. Eur Heart J. 2016 Jul 14;37(27):P.2129-2200

26. Arumugam Narayanan et al. Use speckle-strain imaging to investigate cardiac mechanics in patients with mild hypertensive heart disease, providing insights into early-stage pathology. Circ Cardiovasc Imaging. 2009 Sep ;2(5):P.382-90.

27. Jianwen Wang et al. Examined various measures of left ventricular deformation in patients with diastolic heart failure .Eur Heart J. 2008 May; 29(10):P.1283-9.

28. William H Gaasch Zile. Left ventricular structural remodeling in health and disease, emphasizing the importance of volume, mass, and geometry.J Am Coll Cardiol. 2011 Oct 18;58(17):P.1733-40.

29. Giuseppe Mancia et al .The prevalence of left ventricular hypertrophy in hypertensive patients, both with and without blood pressure control. J Hypertens. 2002 Mar 1;39(3):P.744-9.

30. Ravi V Shah et al. Evaluate the effect of renin-angiotensin system inhibitors on mortality and heart failure hospitalization in patients with heart failure and preserved ejection fraction. J Card Fail. 2010 Mar;16(3):P.260-7.

31. Mai Tone Lønnebakken et al. Investigated left ventricular hypertrophy regression during antihypertensive treatment in an outpatient clinic, shedding light on the potential benefits of therapeutic interventions. J Am Heart Assoc. 2017 Mar 8;6(3): e004152.

32. Marijana Tadic et al. The relationship between left ventricular deformation and different geometric patterns in the hypertensive population, aligning their findings with the updated classification system. J Hypertens. 2015 Sep ;33(9) :P.1954-61.

33. James A de Lemos et al. The role of B-type natriuretic peptide in cardiovascular disease.

34. Lancet. 2003 Jul 26;362(9380) :P.316-22.

35. Alan S Maisel et al. The rapid measurement of B-type natriuretic peptide in the emergency diagnosis of heart failure. N Engl J Med. 2002 Jul 18;347(3) :P.161-7.

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هبه حازم صالح

كلية الصيدلة، جامعة تكريت، تكريت، العراق

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الخلاصة:

الخلفية: قمنا بدراسة على 100 مريض منهم 56 في مجموعة خلل البطين الايسر والباقي في مجموعة الأصحاء (السيطرة) لتقييم أداء البطين الأيسر في مرضى ارتفاع ضغط الدم من خلال فحص الموجات فوق الصوتية للقلب من خلال تتبع الدرجات وارتباطها بمستويات ببتيد الدماغ المنتج للملح في الدم. للعثور على الأبحاث ذات الصلة، تم إجراء بحث شامل عبر الإنترنت. تم استرداد البيانات وتوليفها من الدراسات المدرجة بعد تقييمها للتأكد من جودتها ومخاطر التحيز. أظهرت النتائج ارتباطاً قوياً بين مستويات الببتيد الناتريوتريك من النوع بي والمؤشرات المشتقة لتخطيط صدى القلب لأداء البطين الأيسر في الأفراد الذين يعانون من ارتفاع ضغط الدم . تسلط نتائج هذا الاستعراض الضوء على إمكانات تخطيط صدى القلب كأداة قيمة لتقييم أداء البطين الأيسر في مرضى ارتفاع ضغط الدم بمستويات الببتيد في بغداد .الهدف: تهدف هذه الدراسة إلى معرفة كيفية ارتباط وظيفة البطين لمرضى ارتفاع ضغط الدم، على النحو الذي يحدده تخطيط صدى القلب لتتبع البقع، بمستويات الببتيد في الدم. الطرق: خضع جميع الأشخاص لاختبارات تخطيط صدى القلب باستخدام معدات التصوير بالموجات فوق الصوتية المتاحة تجاريا والمجهزة بمحول مصفوفة مرحلي يعمل بسرعة 3.5 ميجاهرتز، مع قياس المعلمات التالية: ثنائي السطح مع بعض التعديلات لهذه الدراسة، تم حساب جزء طرد البطين الأيسر باستخدام طريقة سيمبسون، وحجم البطين الانقباضي الأيسر والحجم الانقباضي في نهاية البطين الأيسر . وتمت المقارنة مع مجموعة الاصحاء للحصول على نتائج دقيقة. النتائج: كانت هناك اختلافات ذات دلالة إحصائية في جزء طرد البطين الأيسر والعديد من المعلمات أو مؤشرات تخطيط صدى القلب ومستويات الببتيد ونسبة السلالة الطولية العالمية بين مجموعات التحكم واختلال البطين الأيسر كان الخلل الانبساطي أكثر شيوعا في مرضى اختلال وظائف البطين الايسر. وكان لديهم ايضاً قيم السلالة الطولية العالمية أقل من المجموعة الضابطة. تبين أن مستويات الببتيد الناتريوتريك لها علاقة مواتية مع العديد من معلمات تخطيط صدى القلب. كان لدى الأفراد الذين يعانون من ارتفاع ضغط الدم مستويات الببتيد أكبر من المجموعة الضابطة. الخاتمة: قد يكون الجمع بين تدابير السلالة الطولية العالمية ومستويات الببتيد الناتريوتريك طريقة فعالة لتقييم وتتبع وظيفة البطين الأيسر في مرضى ارتفاع ضغط الدم.