CONCLUSIONS

- RV diastolic function affected in patients with bronchial asthma which can be assessed by tissue Doppler study of RV according to TDI TV & RVPI(IVRT) and differs according to severity of bronchial asthma.
- RV strain rate measurement show no affection of RV systolic function in patients with bronchial asthma.

REFERENCES

1. National Institutes of Health (NIH), National Heart, Lung and Blood Institute (NHLBI). Report 2: Guidelines for the diagnosis and management of asthma. USA: NIH, NHLBI; 1997.

2. American Lung Association. Trends in asthma morbidity and mortality. New York: American Lung Association Epidemiology &Statistics Unit Research and Program Services; 2006.

3. Leuchte HH, Baumgartner RA, Nounou ME, Vogeser M, Neurohr C, Trautnitz M, et al. Brain natriuretic peptide is a prognostic parameter in chronic lung disease. Am J Respir Crit Care Med 2006;173(7):744-50.

4. World Health Organization (WHO). Fact Sheet Fact sheet No 307: Asthma. Geneva: WHO; 2013.

5. Global Initiative for Asthma (GINA). Global Strategy for Asthma Management and Prevention. Vancouver (WA): GINA 2011.

6. Mason RJ, Broaddus VC, Martin T, King T Jr, Schraufnagel D, Murray JF, et al. Murray and Nadel's textbook of respiratory medicine. 5th ed. Philadelphia: Saunders/Elsevier; 2010.

7. World Health Organization (WHO). WHO: Asthma. Geneva: WHO; 2007.

8. Bush A, Menzies-Gow A. Phenotypic differences between pediatric and adult asthma. Proc Am Thorac Soc 2009; 6(8): 712–9.

9. Grant EN, Wagner R, Weiss KB. Observations on emerging patterns of asthma in our society. J Allergy ClinImmunol 1999; 104 (2 Pt 2): S1–9.

10. Anandan C, Nurmatov U, van Schayck OC, Sheikh A. Is the prevalence of asthma declining? systematic review of epidemiological studies. Allergy 2010; 65(2): 152–67.

11. Bousquet J, Bousquet PJ, Godard P, Daures, JP. The public health implications of asthma. Bull World Health Organ 2005; 83(7): 548–54.

12. British Thoracic Society, Scottish Intercollegiate Guidelines Network. British guideline on the management of asthma: a national clinical guideline. London, Edinburg: Health care Improvement Scotland, SIGN; 2009.

13. Martinez FD. Genes, environments, development and asthma: a reappraisal. Eur Respir J 2007; 29 (1): 179–84.

14. Yawn BP. Factors accounting for asthma variability: achieving optimal symptom control for individual patients. Prim Care Respir J 2008; 17 (3): 138–47.

15. Kumar V, Abbas AK, Fausto N, Aster JC. Robbins & Cotran pathologic basis of disease. 8th ed. Philadelphia: Elsevier Health Sciences; 2010.

16. Moore WC, Pascual RM. Update in asthma 2009. Am J Respir Crit Care Med 2010;181(11):1181-7.

17. Self T, Chrisman C, Finch C. Asthma. In: Koda-Kimble MA (ed). Applied therapeutics: the clinical use of drugs. 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2009. 22.

18. Delacourt C. Conséquencesbronchiques de l'asthme non traité [Bronchial changes in untreated asthma].Archives de Pédiatrie 2004; 11(Suppl 2): 71s–3s.

19. Schiffman G. Chronic obstructive pulmonary disease. Medicine Net [Cited On: 28 August 2010]. Available from: http://www.onhealth.com/chronic_obstructive_pulmonary_disease_copd/article.htm [Accessed On: 2 July, 2014].

20. Sama SR, Milton DK, Hunt PR, Houseman EA, Henneberger PK, Rosiello RA. Case-by-case assessment of adult-onset asthma attributable to occupational exposures among members of a health maintenance organization. J Occup Environ Med 2006; 48:400-7.

21. Balmes J, Becklake M, Blanc P, Henneberger P, Kreiss K, Mapp C, et al. American Thoracic Society Statement: Occupational contribution to the burden of airway disease. Am J RespirCrit Care Med 2003;167: 787-97.

22. Blanc PD, Toren K. How much adult asthma can be attributed to occupational factors?. Am J Med 1999; 107:580-7.

23. Tarlo SM, Balmes J, Balkissoon R, Beach J, Beckett W, Bernstein D, et al. Diagnosis and management of work-related asthma: American College Of Chest Physicians Consensus Statement. Chest 2008; 134(3 Suppl):1S-41S.

24. British Thoracic Society, Scottish Intercollegiate Guidelines Network. British guideline on the management of asthma: a national clinical guideline. London, Edinburg: Health care Improvement Scotland, SIGN; 2011.

25. Miller MR, Hankinson J, Brusasco V, Burgos F, Casaburi R, Coates A, et al. Standardisation of spirometry. Eur Respir J 2005; 26:319-38.

26. Reddel HK, Taylor DR, Bateman ED, Boulet LP, Boushey HA, Busse WW, et al. An official American Thoracic Society/European Respiratory Society statement: Asthma control and exacerbations: Standardizing endpoints for clinical asthma trials and clinical practice. Am J Respir Crit Care Med 2009; 180:59-99.

27. Raby BA, Steen KV, Celedon JC , Litonjua AA, Lange C, Weiss ST. Paternal history of asthma and airway responsiveness in children with asthma. Am J Respir Crit Care Med 2005;172:552-8.

28. Jardin F, Dubourg O, Margairaz A, Bourdarias JP. Inspiratory impairment in right ventricular performance during acute asthma. Chest 1987;92:789-95.

29. Veler H, Clayton G. Asthma. In: Panitch HB (ed). Pediatric pulmonology, the requisites in pediatrics. Philadelphia: Mosby; 2005. 95-115.

30. Woolcock A, Keena V, Peat J. Definition, classification, epidemiology and risk factors. In: O`Byme M, Thomphson C (eds). Manual of asthma management. 2nd ed. Philadelphia: WB Saunders; 2001. 3-37.

31. Vetter VL. Heart failure in pediatrics. In: Vetter VL, Bell LM (eds). Pediatric cardiology. Philadelphia: Mosby; 2006. 159-67.

32. Bernstein D. The cardiovascular system. In: Behrman RE, Kliegman RM (eds). Nelson textbook of pediatrics. 16th ed. Philadelphia: WB Saunders; 2006. 1475-99.

33. Santoso H. Penyakit jantung paru. In: Sastroasmoro S, Madiyono B (eds). Buku ajar Kardologi anak. Jakarta: Binakarya Aksara; 1994. 391-403.

34. Zhendong Y. Effect of age and respiration on right ventricular diastolic filling patterns in normal children. Pediatr Cardiol 1998; 19:218-20.

35. Davenport PW, Cruz M, Stecenko AA, Kifle Y. Respiratory-related evoked potentials in children with life-threatening asthma. Am J Respir Crit Care Med 2000;161(6):1830-5.

36. The Asthma Divide, Asthma UK. Key facts and statistics. Asthma UK 2009. Available from: http://www.asthma.org.uk/asthma-facts-and-statistics. [Accessed On: 12 June, 2014].

37. Harrison B1, Stephenson P, Mohan G, Nasser S. An ongoing confidential enquiry into asthma deaths in the eastern region of the UK, 2001-2003. Prim Care Respir J 2005; 14(6): 303-13.

38. Noble MJ, Smith JR, Windley J. A controlled retrospective pilot study of an 'at-risk asthma register' in primary care. Prim Care Respir J 2006; 15(2):116-24.

39. Goor DA, Lillehei CW. Congenital malformations of the heart. In: Goor DA, Lillehei CW(eds). Congenital malformations of the heart: embryology, anatomy, and operative considerations.1st ed. New York: Grune & Stratton; 1975. 1–37.

40. Ho SY, Nihoyannopoulos P. Anatomy, echocardiography, and normal right ventricular dimensions. Heart 2006; 92(Suppl 1): i2–13.

41. Jiang L. Right ventricle. In: Weyman AE (ed). Principle and practice of echocardiography. Baltimore: Lippincott Williams & Wilkins; 1994. 901–21.

42. Farb A, Burke AP, Virmani R. Anatomy and pathology of the right ventricle (including acquired tricuspid and pulmonic valve disease. Cardiol Clin 1992;10:1–21.

43. Lorenz CH, Walker ES, Morgan VL, Klein SS, Graham TP Jr. Normal human right and left ventricular mass, systolic function, and gender differences by cine magnetic resonance imaging. J Cardiovasc Magn Reson 1999; 1:7–21.

44. Dell'Italia LJ. The right ventricle: anatomy, physiology, and clinical importance. Curr Probl Cardiol 1991;16:653–720.

45. Dell'Italia LJ. The right ventricle: anatomy, physiology, and clinical importance. Curr Probl Cardiol 1991;16:653–720.

46. Petitjean C, Rougon N, Cluzel P. Assessment of myocardial function: a review of quantification methods and results using tagged MRI. J Cardiovasc Magn Reson 2005; 7:501–16.

47. Davidson C, Bonow R. Cardiac catheterization. In: Zipes D, Libby P, Bonow R, Braunwald E (eds). Braunwald's heart disease: a textbook of cardiovascular medicine.8thed. Philadelphia: Elsevier; 2007. 439-64.

48. Dell'Italia LJ, Walsh RA. Acute determinants of the hangout interval in the pulmonary circulation. Am Heart J 1988; 116: 1289 –97.

49. Dell'Italia LJ. Mechanism of postextrasystolic potentiation in the right ventricle. Am J Cardiol 1990; 65: 736 –41.

50. Goldstein JA, Barzilai B, Rosamond TL, Eisenberg PR, Jaffe AS. Determinants of hemodynamic compromise with severe right ventricular infarction. Circulation 1990; 82: 359 –68.

51. Feneley MP, Gavaghan TP, Baron DW, Branson JA, Roy PR, Morgan JJ. Contribution of left ventricular contraction to the generation of right ventricular systolic pressure in the human heart. Circulation 1985; 71: 473–80.

52. Santamore WP, Dell'Italia LJ. Ventricular interdependence: significant left ventricular contributions to right ventricular systolic function. Prog Cardiovasc Dis 1998; 40:289 –308.

53. Suga H, Sagawa K, Shoukas AA. Load independence of the instantaneous pressure-volume ratio of the canine left ventricle and effects of epinephrine and heart rate on the ratio. Circ Res 1973; 32: 314 –22.

54. Starling MR, Walsh RA, Dell'Italia LJ, Mancini GB, Lasher JC, Lancaster JL. The relationship of various measures of end-systole to left ventricular maximum time-varying elastance in man. Circulation 1987; 76:32– 43.

55. Brown KA, Ditchey RV. Human right ventricular end-systolic pressurevolume relation defined by maximal elastance. Circulation 1988; 78: 81–91.

56. Dell'Italia LJ, Walsh RA. Application of a time varying elastance model to right ventricular performance in man. Cardiovasc Res 1988; 22: 864 –74.

57. MacNee W. Pathophysiology of cor pulmonale in chronic obstructive pulmonary disease: part one. Am J Respir Crit Care Med 1994; 150: 833–52.

58. Chin KM, Kim NH, Rubin LJ. The right ventricle in pulmonary hypertension. Coron Artery Dis 2005; 16:13–8.

59. Yu CM, Sanderson JE, Chan S, Yeung L, Hung YT, Woo KS. Right ventricular diastolic dysfunction in heart failure. Circulation 1996; 93: 1509 –14.

60. Burgess MI, Mogulkoc N, Bright-Thomas RJ, Bishop P, Egan JJ, Ray SG. Comparison of echocardiographic markers of right ventricular function in determining prognosis in chronic pulmonary disease. J Am Soc Echocardiogr 2002; 15: 633–9.

61. Bleeker GB, Steendijk P, Holman ER, Yu CM, Breithardt OA, Kaandorp TA, et al. Assessing right ventricular function: the role of echocardiography and complementary technologies. Heart 2006; 92(suppl 1):i19 –26.

62. Rudski LG, Lai WW, Afilalo J, Hua L, Handschumacher MD, Chandrasekaran K, et al. Guidelines for echocardiographic assessment of the right heart in adults: a report from the American Society of Echocardiogaphy endorsed by the Euopean Association of Echocardiography, a registered branch of European Society of Cardiology, and the Canadian Society of Echcardiography. J Am Soc Echocardiogr 2010; 23: 685-713.

63. Lindqvist P, Henein M, Kazzam E. Right ventricular outflow-tract fractional shortening: an applicable measure of right ventricular systolic function. Eur J Echocardiogr 2003; 4: 29-35.

64. Kaul S, Tei C, Hopkins JM, Shah PM. Assessment of right ventricular function using two dimensional echocardiography. Am Heart J 1984;107: 526-31.

65. Lopez-Candales A, Dohi K, Rajagopalan N, Edelman K, Gulyasy B, Bazaz R. Definig normal variables of right ventricular size and function in pulmonary hypertension: an echocardiographic study. Postgrad Med J 2008; 84: 40-5.

66. Miller D, Farah MG, Liner A, Fox K, Schluchter M, Hoit BD. The relation between quantitative right ventricular ejection fraction and indices of tricuspid annular motion and myocardial performance. J Am Soc Echocardiogr 2004;17: 443-7.

67. Tamborini G, Pepi M, Galli CA, Maltagliati A, Celeste F, Muratori M, et al. Feasibility and accuracy of a routine echocardiographic assessment of right ventricular function. Int J Cardiol 2007; 115: 86-9.

68. Tei C, Dujardin KS, Hodge DO, Bailey KR, McGoon MD, Tajik AJ, et al. Doppler echocardiographic index for assessment of global right ventricular function. J Am Soc Echocardiogr 1996; 9: 838-47.

69. Yoshifuku S, Otsuji Y, Takasaki K, Yuge K, Kisanuki A, Toyonaga K, et al. Pseudonormalized Doppler total ejection isovolume (Tei) index in patients with right ventricular acute myocardial infarction. Am J Cardiol 2003; 91: 527-31.

70. Rojo EC, Rodrigo JL, Perez de Isla L, Almería C, Gonzalo N, Aubele A, et al. Disagreement between tissue Doppler imaging and conventional pulsed wave Doppler in the measurement of myocardial performance index. Eur J Echocardiogr 2006; 7: 356-64.

71. Gaibazzi N, Petrucci N, Ziacchi V. Left ventricle myocardial performance index derived either by conventional method or mitral annulus tissue-Doppler: a comparison study in healthy subjects and subjects with heart failure. J Am Soc Echocardiogr 2005;18: 1270-6.

72. Sebbag I, Rudski LG, Therrein J, Hirsch A, Langleben D. Effect of chronic infusion of epoprostenol on echocardiographic right ventricular myocardial performance index and its relation to clinical outcome in patients with primary pulmonary hypertension. Am J Cardiol 2001; 88:1060-3.

73. Abd El Rahman MY, Abdul-Khaliq H, Vogel M. Value of the new Doppler-derived myocardial performance index for the evaluation of right and left ventricular function following repair of tetralogy of fallot. Pediatr Cardiol 2002; 23: 502-7.

74. Chockalingam A, Gnanavelu G, Alagesan R, Subramaniam T. Myocardial performance index in evaluation of acute right ventricular myocardial infarction. Echocardiography 2004; 21: 487-94.

75. Eidem BW, O`Leary PW, Tei C, Seward JB. Usefulness of the myocardial performance index for assessing right ventricular function in congenital heart disease. Am J Cardiol 2000; 86: 654-8.

76. Moller JE, Sondergaard E, Poulsen SH, Appleton CP, Egstrup K. Serial Doppler echocardiographic assessment of left and right ventricular performance after a first myocardial infarction. J Am Soc Echocardiogr 2001;14(4):249-55.

77. Morner S, Lindqvist P, Waldenstrom A, Kazzam E. Right ventricular dysfunction in hypertrophic cardiomyopathy as evidenced by the myocardial performance index. Int J Cardiol 2008;124(1):57-63.

78. Schwerzmann M, Sammam AM, Salehain O, Holm J, Provost Y, Webb GD, et al. Comparison of echocardiographic and cardiac magnetic resonance imaging for assessing right ventricular function in adults with repaired tetralogy of fallot. Am J Cardiol 2007; 99: 1593-7.

79. Pellerin D, Sharma R, Elliott P, Veyrat C. Tissue Doppler, strain, and strain rate echocardiography for the assessment of left and right systolic ventricular function. Heart 2003;89(3):iii9-17.

80. D`Hooge J, Heimdal A, Jamal F, Kukulski T, Bijnens B, Rademakers F, et al. Regional strain and strain rate measurements by cardiac ultrasound: principles, implementation and limitations. Eur J Echocardiogr 2000;1: 154-70.

81. Abraham TP, Dimaano VL, Liang HY. Role of tissue Doppler and strain echocardiography in current clinical practice. Circulation 2007;116: 2597-609.

82. Heimdal A, Stoylen A, Torp H, Skjaerpe T. Real-time strain rate imaging of the left ventricle by ultrasound. J Am Soc Echocardiogr 1998;11(11):1013-9.

83. Lindqvist P, Waldenstrom A, Henein M, Mörner S, Kazzam E. Regional and global right ventricular function in healthy individuals aged 20-90 years: a pulsed Doppler tissue imaging study: Umea General Population Heart Study. Echocardiography 2005; 22: 305-14.

84. Sutherland GR, Di Salvo G, Claus P, D'Hooge J, Bijnens B. Strain and strain rate imaging: a new clinical approach to quantifying regional myocardial function. J Am Soc Echocardiogr 2004;17(7):788-802.

85. Kjaergaard J, Sogaard P, Hassager C. Right ventricular strain in pulmonary embolism by Doppler tissue echocardiography. J Am Soc Echocardiogr 2004; 17: 1210-2.

86. Kittipovanonth M, Bellavia D, Chandrasekaran K, Villarraga HR, Abraham TP, Pellikka PA. Doppler myocardial imaging for early detection of right ventricular dysfunction in patients with pulmonary hypertension. J Am Soc Echocardiogr 2008; 21: 1035-41.

87. Chow PC, Liang XC, Cheung EW, Lam WW, Cheung YF. New two-dimensional global longitudinal strain and strain rate imaging for assessment of systemic right ventricular function. Heart 2008; 94: 855-9.

88. Koyama J, Ray-Sequin PA, Falk RH. Longitudinal myocardial function assessed by tissue velocity, strain, and strain rate tissue Doppler echocardiography in patients with AL (primary) cardiac amyloidosis. Circulation 2003; 107: 2446-52.

89. Lindqvist P, Olofsson BO, Backman C, Suhr O, Waldenström A. Pulsed tissue Doppler and strain imaging discloses early signs of infiltrative cardiac disease: a study on patients with familial amyloidotic polyneuropathy. Eur J Echocardiogr 2006; 7: 22-30.

90. Sun JP, Stewart WJ, Yang XS, Donnell RO, Leon AR, Felner JM, et al. Differentiation of hypertrophic cardiomyopathy and cardiac amyloidosis from other causes of ventricular wall thickening by two-dimensional strain imaging echocardiography. Am J Cardiol 2009;103(3):411-5.

91. Lang RM, Bierig M, Devereux RB, Flachskampf FA. Recommendations for chamber quantification: a report from the american society of echocardiography's guidelines and standards committee and the chamber quantification writing group, developed in conjunction with the european association of echocardiography, a branch of the european society of cardiology. J Am Soc Echocardiography 2005; 18:1440-63.

92. Otto CM. Textbook of clinical echocardiography. 4thed. China: Natasha Andjelkovic; 2009.

93. Simonson JS, Schiller NB. Sonospirometry: a new method for noninvasive estimation of mean right atrial pressure based on two-dimensional echographic measurements of the inferior vena cava during measured inspiration. J Am Coll Cardiol 1988; 11:557–64.

94. Kircher BJ, Himelman RB, Schiller NB. Noninvasive estimation of right atrial pressure from the inspiratory collapse of the inferior vena cava. Am J Cardiol 1990; 66:493–6.

95. Berger M, Haimowitz A, Van Tosh A, Berdoff RL, Goldberg E. Quantitative assessment of pulmonary hypertension in patients with tricuspid regurgitation using continuous wave Doppler ultrasound. J Am Coll Cardiol 1985;6(2):359-65.

96. Berg S. Myocardial strain rate by doppler ultrasound methods. angle dependency and error estimation. Master Thesis. Department of Engineering Cybernetics, NTNU, Trondheim, Norway; 2004.

97. Chicherina EN, Malykh SZ, Shipitsina VV. The myocardial condition in chronic obstructive pulmonary disease and bronchial asthma. Klin Med (Mosk) 2007; 85(2): 23–6.

98. Peng SM, Sun P, Zeng J, Deng XM. Cardiac function of children with bronchial asthma. Zhongguo Dang Dai Er Ke Za Zhi 2006; 8(5): 388–90.

99. Zeybek C, Yalcin Y, Erdem A. Polat TB, AktugluZeybek AC, Bayoglu V. Tissue Doppler echocardiographic assessment of cardiac function in children with bronchial asthma. Pediatr Int 2007; 49(6): 911–7.

100. Shedeed SA. Right ventricular function in children with bronchial asthma: a tissue Doppler echocardiographic study. Pediatr Cardiol 2010;31(7):1008-15.

101. Palka P, Lange A, Fleming AD, Fenn LN, Bouki KP, Shaw TR, et al. Age-related transmural peak mean velocities and peak velocity gradients by Doppler myocardial imaging in normal subjects. Eur Heart J 1996;17(6):940-50.

102. Coghlan JG, Davar J. How should we assess right ventricular function in 2008?. Eur Heart J 2007; 9: H22–8.

103. Sutherland GR, Lange A, Palka P, Grubb N, Fleming A, McDicken WN. Does Doppler myocardial imaging give new insights or simply old information revisited (editorial). Heart 1996; 76:197–9.

104. Abdalla ME, Azeem HAE. Echocardiographic evaluation of ventricular function in young adults with bronchial asthma. Egyptian J Chest Dis Tuberc 2013;62(1):27-31.

105. Mahmoud MMK, Mohamed EA, Tarek AR. Doppler echocardiographic evaluation of ventricular function in patients with bronchial asthma. Alex J Pediatr 2005; 19(1): 7–11.

106. Salpeter SR, Ormiston TM, Salpeter EE. Cardiovascular effects of beta-agonists in patients with asthma and COPD: a meta-analysis. Chest 2004;125(6):2309-21.

107. Hirono O, Kubota I, Minamihaba O, Fatema K, Kato S, Nakamura H, et al. Left ventricular diastolic dysfunction in patients with bronchial asthma with long-term oral beta2-adrenoceptor agonists. Am Heart J 2001;142(6): E11.

108. Elmasry OAE, Attia HM, Abdelfattah NM. Assessment of left ventricular diastolic function in bronchial asthma: can we rely on transmitral inflow velocity patterns?. Eur J Echocardiogr 2008; 7 (Suppl 3): 178–90.

109. Alpaslan M, Onrat E, Evcik D. Doppler echocardiographic evaluation of ventricular function in patients with rheumatoid arthritis, Clin Rheumatol 2003; 22(2): 84–8.

110. MeiLan KH, Vallerie VM, Gerard JC, Fernando JM. Pulmonary diseases and the heart. Circulation 2007; 116: 2992–3005.

111. Sobhy KE, El-Korashy RIM, Ahmed MK, Fayed FGM. Right ventricular diastolic dysfunction in asthmatic patients. Egyptian J Chest Dis Tuberc 2014;63(1):29-32.

112. Fujii J, Yazaki Y, Sawada H, Aizawa T, Watanabe H, Kato K. Noninvasive assessment of left and right ventricular filling in myocardial infarction with a two-dimensional Doppler echocardiographic method. J Am Coll Cardiol 1985;5(5):1155-60.

113. Snider AR, Ritter SB, Serwer GA. From assessment of ventricular function. In: Snider AR, Ritter SB, Serwer GA (eds). Echocardiography in pediatric heart disease. 2nd ed. New York: Mosby; 1997. 195-223.

114. Eniseeva ES, Sizykh TP. The hemodynamic status and right ventricular diastolic function of bronchial asthma patients. Ter Arkh 1995; 67 (8): 39–42.

115. Bagnato GF, Mileto A, Gulli S, Piscioneri S, Romano C, Giacobbe O, et al. Non invasive assessment of cardiac function in patients with bronchial asthma (BA) or chronic obstructive pulmonary disease (COPD). Allergol Immunopathol 1999;27(1):5-10.

116. Ozdemir O, Ceylan Y, Razi CH, Ceylan O, Andiran N. Assessment of ventricular functions by tissue Doppler echocardiography in children with asthma. Pediatr Cardiol 2013;34(3):553-9.

117. Panidis IP, Ren JF, Holsclaw DS, Kotler MN, Mintz GS, Ross J. Cardiac function in patients with cystic fibrosis: evaluation by two-dimensional and Doppler echocardiography. J Am Coll Cardiol 1985; 6:701–6.

118. Massoud MN, El Nawawy AA, El Nazar SY, Abdel-Rahman GM. Tumour necrosis factor-alpha concentration in severely asthmatic children. East Mediterr Health J 2000; 6(2-3): 432-6.

119. Annagür A, Kendirli SG, Yilmaz M, Altintas DU, Inal A. Is there any relationship between asthma and asthma attack in children and atypical bacterial infections; Chlamydia pneumoniae, Mycoplasma pneumoniae and Helicobacter pylori. J Trop Pediatr 2007; 53(5): 313-8.

120. Mann DL. The effect of tumor necrosis factor-alpha on cardiac structure and function: A tale of two cytokines. J Card Fail 1996; 2(4 Suppl): S165-72.

121. Gunen H, Hacievliyagil SS, Kosar F, Gulbas G, Kizkin O, Sahin I. The role of arterial blood gases,exercise testing, and cardiac examination in asthma. Allergy Asthma Proc 2006; 27(1): 45-52.

Table (1): Cases group

Case no.	Sex	Age	Weight	Height	BMI	Duration of Bronchial asthma	symptoms	Other allergy	Medication	Medication	Other Diseases	pulse	Systolic	Diastolic	wheezes	accentuated P2	TR	ECG
1	Female	40.00	80.00	160.00	31.25	7.00	Both	no	Oral	Yes	no	84.00	110.00	70.00	yes	no	no	Normal
2	Female	28.00	60.00	156.00	24.65	0.25	Both	no	Oral	Yes	no	72.00	110.00	70.00	yes	no	no	Normal
3	Female	40.00	62.00	156.00	25.48	10.00	Both	no	inhaler bronchodilator	Yes	no	75.00	120.00	70.00	yes	no	yes	Normal
4	Female	40.00	76.00	153.00	32.47	5.00	Dyspnea	no	No	No	no	80.00	120.00	80.00	no	no	no	Normal
5	Female	26.00	56.00	162.00	21.34	20.00	Dyspnea	no	inhaler bronchodilator	Yes	no	88.00	110.00	70.00	yes	no	no	Normal
6	Female	40.00	77.00	153.00	32.89	1.00	Cough	no	No	No	no	100.00	120.00	70.00	no	no	no	Normal
7	Female	36.00	101.00	160.00	39.45	5.00	Dyspnea	no	No	No	no	95.00	130.00	80.00	yes	no	no	Normal
8	Female	30.00	95.00	162.00	36.20	11.00	Both	no	inhaler bronchodilator	Yes	no	82.00	120.00	70.00	yes	no	no	Normal
9	Female	40.00	101.00	160.00	39.45	10.00	Both	no	inhaler bronchodilator	Yes	no	84.00	100.00	70.00	no	no	yes	Normal
10	Female	40.00	95.00	162.00	36.20	16.00	Cough	sinusitis	No	No	no	96.00	120.00	80.00	no	no	no	Normal
11	Female	40.00	57.00	148.00	26.02	15.00	Both	no	inhaler bronchodilator	Yes	no	76.00	110.00	70.00	no	no	no	Normal
12	Female	20.00	65.00	155.00	27.06	6.00	Dyspnea	no	inhaler bronchodilator	Yes	no	65.00	100.00	70.00	yes	no	yes	Normal
13	Female	40.00	86.00	158.00	34.45	13.00	Both	no	inhaler bronchodilator	Yes	no	90.00	120.00	70.00	no	no	no	Normal
14	Male	30.00	58.00	153.00	24.78	15.00	Dyspnea	no	inhaler bronchodilator	Yes	no	90.00	130.00	80.00	yes	no	no	Normal
15	Female	36.00	49.00	153.00	20.93	8.00	Both	no	No	No	no	90.00	100.00	70.00	yes	no	no	Normal

Table (2): Cases group "continue"

Case no.	RVOT(max.diamter)	RVOT(min.diamter)	FAC	TABSE	IVC (expiration)	IVC (inspiration)	IVC %collapse	TV flow (E)	TV flow (A)	TV flow E/A	TV deccl time	RVPI(IVCT)	RVPI(IVRT)	RVPI(ET)	TR	Peak S gradient	PA accel. time (sec)
1	23.80	12.50	47.60	26.60	18.00	13.00	27.70	47.00	53.00	0.88	148.00	57.00	263.00	57.00	Mild	20.00	155.00
2	25.00	17.00	34.00	25.00	14.00	8.00	42.80	58.00	48.00	1.20	283.00	67.00	310.00	74.00	No	.	142.00
3	38.00	21.00	46.00	17.00	16.00	4.00	75.00	59.00	50.00	1.18	331.00	88.00	196.00	88.00	Mild	8.00	130.00
4	33.00	17.00	48.30	24.00	15.00	9.00	40.00	45.00	55.00	0.81	155.00	51.00	370.00	137.00	Mild	13.00	101.00
5	29.00	24.00	43.00	19.00	16.00	11.00	31.20	35.00	50.00	0.70	101.00	61.00	378.00	54.00	Mild	13.00	182.00
6	26.00	16.80	43.00	23.60	6.00	3.50	41.60	58.00	58.00	1.00	162.00	37.00	236.00	34.00	No	.	95.00
7	29.00	21.00	25.00	22.00	15.00	8.00	46.60	57.00	50.00	1.14	223.00	44.00	334.00	30.00	No	.	169.00
8	34.00	16.50	43.00	26.00	13.00	8.00	38.40	59.00	67.00	0.88	182.00	67.00	213.00	40.00	No	.	115.00
9	26.00	15.00	32.00	17.00	11.00	6.00	45.40	52.00	68.00	0.76	94.00	67.00	317.00	128.00	Mild	14.00	67.00
10	36.00	18.00	43.00	26.60	17.00	12.00	29.40	67.00	63.00	1.06	209.00	94.00	283.00	74.00	No	.	61.00
11	35.40	23.00	34.60	16.00	14.00	8.00	42.80	43.70	35.80	1.22	111.00	51.00	233.00	57.00	No	.	182.00
12	33.00	19.00	43.00	25.00	15.00	9.00	40.00	42.60	52.00	0.81	223.00	37.00	273.00	51.00	Mild	19.00	148.00
13	31.00	24.00	21.80	19.80	16.00	10.00	37.50	43.00	60.00	0.71	277.00	74.00	256.00	81.00	No	.	57.00
14	34.00	20.00	40.00	25.90	18.00	13.40	25.50	57.00	56.00	1.01	216.00	30.00	297.00	54.00	No	.	101.00
15	20.90	16.50	22.00	23.50	6.30	2.70	57.10	39.00	54.00	0.72	120.00	40.00	202.00	47.00	No	.	182.00

Table (3): Cases group "continue"

Case no.	TDI TV (E)	TDI TV (A)	TDI TV (S)	RV (Strain)%	RV (Strain rate)	CXR	PH	PCo_2	PO_2	O_2 sat.	FEV1	FEV1%	FEV1%
1	116.00	95.00	82.00	-18.49	-3.45	Normal	7.40	37.00	95.00	94.00	2.26	86.26	>80 Mild
2	157.00	111.00	150.00	-27.30	-3.10	Normal	7.47	27.70	107.60	98.50	2.89	77.07	60 - 80 Moderate
3	93.00	119.00	131.00	-3.69	-2.97	Normal	7.42	40.00	75.00	95.00	1.69	51.68	<60 Severe
4	111.00	115.00	136.00	-14.40	-2.30	Normal	7.38	39.00	92.00	96.00	1.74	78.03	60 - 80 Moderate
5	123.00	154.00	136.00	-12.00	-1.04	Normal	7.38	38.00	90.00	96.00	1.65	62.03	60 - 80 Moderate
6	109.00	161.00	242.00	-20.10	-2.00	Normal	7.40	36.00	92.00	97.00	2.53	85.47	>80 Mild
7	111.00	109.00	130.00	-7.90	-1.70	Normal	7.40	37.00	93.00	98.00	0.67	47.86	<60 Severe
8	125.00	120.00	211.00	-20.80	-2.90	Normal	7.40	39.00	96.00	98.00	2.65	85.48	>80 Mild
9	143.00	68.00	118.00	-11.40	-1.07	Normal	7.38	39.00	92.00	96.00	1.74	78.03	60 - 80 Moderate
10	181.00	143.00	301.00	-14.90	-1.69	Normal	7.37	38.00	94.00	96.00	1.28	56.89	<60 Severe
11	114.00	128.00	139.00	-13.20	-1.26	Normal	7.39	38.00	97.00	95.00	1.08	45.76	<60 Severe
12	138.00	113.00	135.00	-7.25	-2.94	Normal	7.38	40.00	93.00	95.00	1.44	75.39	60 - 80 Moderate
13	127.00	84.00	187.00	-10.88	-1.12	Normal	7.40	38.00	94.00	94.00	1.28	56.89	<60 Severe
14	186.00	149.00	265.00	-15.38	-2.25	Normal	7.39	38.00	98.00	98.00	0.59	72.84	60 - 80 Moderate
15	163.00	119.00	197.00	-9.39	-2.78	Normal	7.40	37.00	95.00	94.00	0.68	59.65	<60 Severe

Table (4): Control group

Case no.	Sex	Age	Weight	Height	BMI	Other allergy	Other Diseases	pulse	Systolic	Diastolic	wheezes	accentuated P2	TR	ECG	RVOT(max.diamter)	RVOT(min.diamter)	FAC	TAPSE	IVC (expiration)
1	Female	35.00	58.00	162.00	22.10	no	no	80.00	110.00	70.00	no	no	no	no	32.00	20.00	38.20	20.40	7.00
2	Female	34.00	80.00	158.00	32.05	no	no	84.00	100.00	70.00	no	no	no	no	26.30	15.00	45.90	21.30	12.00
3	Female	22.00	60.00	160.00	23.44	no	no	70.00	120.00	80.00	no	no	no	no	29.00	17.00	39.00	22.00	14.80
4	Male	29.00	58.00	173.00	19.38	no	no	70.00	130.00	80.00	no	no	no	no	30.00	18.00	39.00	21.00	13.00
5	Female	40.00	86.00	154.00	36.26	no	no	88.00	120.00	70.00	no	no	no	no	37.00	23.00	38.60	24.60	16.00
6	Female	31.00	66.00	164.00	24.54	no	no	70.00	110.00	70.00	no	no	no	no	32.80	18.40	43.80	24.60	12.00
7	Female	33.00	58.00	150.00	25.78	no	no	70.00	120.00	80.00	no	no	no	no	20.00	12.70	36.00	21.00	15.60
8	Female	30.00	60.00	158.00	24.03	no	no	80.00	110.00	80.00	no	no	no	no	36.00	22.00	38.00	22.00	15.00
9	Female	35.00	70.00	158.00	28.04	no	no	70.00	120.00	80.00	no	no	no	no	32.00	20.00	39.00	21.00	12.00
10	Female	35.00	81.00	159.00	32.04	no	no	80.00	100.00	70.00	no	no	no	no	27.00	16.00	44.00	22.00	12.00
11	Female	28.00	61.00	161.00	23.53	no	no	74.00	120.00	70.00	no	no	no	no	30.00	18.00	40.00	23.00	15.00
12	Female	30.00	64.00	170.00	22.15	no	no	80.00	120.00	70.00	no	no	no	no	31.00	19.00	40.00	22.00	13.00
13	Female	40.00	85.00	156.00	34.93	no	no	86.00	120.00	70.00	no	no	no	no	37.00	23.00	38.50	24.00	16.00
14	Female	34.00	80.00	158.00	32.05	no	no	84.00	100.00	70.00	no	no	no	no	26.40	15.00	45.90	21.30	12.00
15	Female	27.00	60.00	160.00	23.44	no	no	70.00	120.00	80.00	no	no	no	no	29.00	17.00	39.00	22.00	14.70

Table (5): Control group "continue"

Case no.	IVC (inspiration)	IVC %collapse	TV flow (E)	TV flow (A)	TV flow E/A	TV deccl time	RVPI(IVCT)	RVPI(IVRT)	RVPI(ET)	TR	Peak S gradient	PA accel. time (sec)	TDI TV (E)	TDI TV (A)	TDI TV (S)	RV (Strain) %	RV (Strain rate)
1	2.00	86.00	58.00	56.00	1.03	162.00	51.00	151.00	61.00	No	.	121.00	134.00	152.00	117.00	-30.64	-3.82
2	6.00	50.00	48.00	50.00	0.96	165.00	61.00	192.00	78.00	No	.	125.00	193.00	226.00	212.00	-2.75	-0.97
3	9.00	39.00	40.00	48.00	0.83	216.00	47.00	216.00	81.00	No	.	142.00	185.00	124.00	91.00	-6.73	-1.29
4	6.00	53.80	57.00	55.00	1.03	202.00	47.00	210.00	51.00	No	.	121.00	180.00	130.00	156.00	-5.90	-1.56
5	9.00	43.70	50.00	58.00	0.86	146.00	54.00	243.00	44.00	No	.	115.00	143.00	164.00	119.00	-17.90	-1.60
6	6.00	50.00	43.00	40.00	1.07	256.00	61.00	107.00	57.00	Mild	16.00	175.00	227.00	238.00	200.00	-1.90	-3.90
7	8.40	46.10	51.00	45.60	1.11	115.00	53.00	242.00	45.00	No	.	148.00	140.00	154.00	147.00	-17.00	-1.58
8	8.00	46.60	50.00	58.00	0.86	146.00	54.00	243.00	44.00	No	.	100.00	144.00	165.00	120.00	-16.80	-1.60
9	6.00	50.00	57.00	55.00	1.03	163.00	50.00	150.00	60.00	No	.	120.00	133.00	151.00	116.00	-30.00	-3.80
10	6.00	50.00	49.00	51.00	0.96	166.00	62.00	193.00	79.00	No	.	126.00	194.00	227.00	213.00	-3.10	-1.10
11	8.00	46.60	41.00	49.00	0.83	217.00	48.00	217.00	80.00	No	.	143.00	186.00	125.00	92.00	-6.78	-1.30
12	6.00	53.80	58.00	56.00	1.03	203.00	48.00	281.00	52.00	No	.	122.00	181.00	131.00	157.00	-6.10	-1.60
13	9.00	43.70	50.00	58.00	0.86	146.00	54.00	243.00	44.00	No	.	105.00	143.00	164.00	119.00	-17.90	-1.60
14	5.00	58.00	48.00	50.00	0.96	165.00	61.00	192.00	78.00	No	.	125.00	193.00	226.00	212.00	-2.75	-0.97
15	9.00	38.70	40.00	48.00	0.83	216.00	47.00	216.00	81.00	No	.	142.00	125.00	124.00	91.00	-6.73	-1.29

الملخص العربى

الربو الشعبي عبارة عن التهاب هوائي مزمن يتصف بانسداد للممرات الهوائية وهناك ارتفاع في الضغط السلبي خلال الشهيق والضغط الايجابي خلال الزفير وهو ما يتجاوز التحميل المسبق والتالى للبطين الايمن الذي قد يتسبب فى زيادة الضغط داخل الصدر.

الشد هو مقياس لتشوه النسيج ويعرف بأنه التغير في الطول ليتطبع للطول الأصلي. ويسمى المعدل الذي يحدث هذا التغيير معدل الشد. التشوه في جسم أحادى الأبعاد، مثل شريط رقيق يقتصر على إطالة أو تقصير هذا الشريط.

وقد تم دراسة قيم الشد ومعدل الشد في عدد من الظروف التي تؤثر على الجانب الايمن للقلب ، بما في ذلك محدث اضطراب النظم البطيني الأيمن والانسداد الرئوي وارتفاع ضغط الدم الرئوي، والداء النشواني.

الهدف من هذا العمل هو تقييم وظائف البطين الأيمن في المرضى الذين يعانون من الربو الشعبي باستخدام قياس معدل الشد باستخدام دوبلرالأنسجة . وربطها مع مدى خطورة نوبات الربو.

وقد أجريت هذه الدراسة في قسمي القلب و الصدر بمستشفى جامعة الإسكندرية الرئيسي .

وتم تقسيم مجموعات البحث إلى مجموعتين:

١) **المجموعة الأولى:** وتضم هذه المجموعة خمسة عشر مريضا يعانون من الربو الشعبي المزمن.
٢) **المجموعة الثانية:** تتضمن نفس الفئة العمرية والجنس للمجموعة الاولى وتحتوي على خمسة عشر فردا صحيا ليسوا مرضى بالربو كمجموعة تحكم.

خضعت كلا المجموعتين إلى:
١- فحص اكلينيكي كامل.
٢- موجات صوتية على القلب.

المجموعة الاولى تم عمل التالي لها :
١- اشعة عادية على الصدر والقلب.
٢- رسم قلب كهربائي بدون مجهود.
٣- غازات الدم الشرياني.
٤- قياس التنفس(حجم الزفير القسري١ ونسبة حجم الزفير القسري١)

في الدراسة الحالية، أظهر دوبلر الأنسجة للبطين الأيمن بما يخص وظيفة الانبساط أن مرضى الربو لديهم ضعف بنمط استرخاء البطين الأيمن وبالتالي ضعف بوظيفة الانبساط للبطين الايمن.

في هذه الدراسة وجدنا أن هناك فروق ذات دلالة إحصائية بين مجموعة الربو الشعبي والمجموعة الضابطة فيما يتعلق بالنبض (٨٤.٤٧ ± ٩.٦٨ و ٧٧.٠٧ ± ٦.٧٦ ,على التوالي).

في هذه الدراسة وجدنا أن هناك فروق ذات دلالة إحصائية بين المجموعة الربو الشعبي والمجموعة الضابطة فيما يتعلق وقت الاسترخاء الإسوية الحجم (٢٧٧.٤٠ ± ٥٧.١٨ و ٢٠٦.٤٠ ± ٤٤.٦٣، على التوالي).

في هذه الدراسة وجدنا أن هناك فروق ذات دلالة إحصائية بين مجموعة الربو الشعبي والمجموعة الضابطة فيما يتعلق بالتصوير دوبلر الأنسجة للصمام ثلاثي الشرف موجة A,E

كما تبين أن هذه التأثيرات الضارة تزامنت اكثر مع شدة حالات الربو حيث ان حالات الربو الشديدة عانت المزيد من ضعف في وظيفة الانبساط (وقت الاسترخاء الإسوية الحجم) للبطين الأيمن من حالات الربو الخفيفة والمتوسطة. هذا يعني ان المرضى الذين يعانون من الربو الشعبي يكون اختلال البطين الأيمن وشدة اضطراب وظيفي متوازي مع شدة المرض.

جامعة الإسكندرية
كلية الطب
قسم أمراض القلب والأوعية الدموية

تقييم وظائف البطين الأيمن في مرضى الأزمة الربوية باستخدام معدل الشد

رسالة مقدمة

لقسم أمراض القلب والأوعية الدموية ـ كلية الطب ـ جامعة الإسكندرية
ضمن متطلبات درجة

الماجستير

فى

أمراض القلب والأوعية الدموية

مـــن

رشا كمال محمود الشرقاوي
بكالوريوس الطب والجراحة ، ٢٠٠٤
كلية الطب، جامعة الإسكندرية

[٢٠١٥]

جامعة الإسكندرية
كلية الطب
قسم أمراض القلب والأوعية الدموية

تقييم وظائف البطين الأيمن في مرضى الأزمة الربوية باستخدام معدل الشد

رسالة مقدمة من

رشا كمال محمود الشرقاوي

للحصول على درجة

الماجستير

فى

أمراض القلب والأوعية الدموية

لجنة المناقشة والحكم على الرسالة	**التوقيع**
أ.د/ محمد إيهاب محمد محمد عطا أستاذ أمراض الصدر قسم أمراض الصدر كلية الطب جامعة الإسكندرية	.....
أ.د/ كمال محمود محمود أستاذ أمراض القلب والأوعية الدموية قسم أمراض القلب والأوعية الدموية معهد البحوث الطبية جامعة الإسكندرية	.....
أ.د/ صلاح محمد الطحان أستاذ أمراض القلب والأوعية الدموية قسم أمراض القلب والأوعية الدموية كلية الطب جامعة الإسكندرية	.....

لجنة الإشراف **موافقون**

أ.د/ صلاح محمد الطحان .....

أستاذ أمراض القلب والأوعية الدموية
قسم أمراض القلب والأوعية الدموية
كلية الطب
جامعة الإسكندرية

أ.م.د/ إيمان محمد الشرقاوي .....

أستاذ مساعد أمراض القلب والأوعية الدموية
قسم أمراض القلب والأوعية الدموية
كلية الطب
جامعة الإسكندرية

أ.م. د/ احمد يوسف جاد .....

أستاذ مساعد أمراض الصدر
قسم أمراض الصدر
كلية الطب
جامعة الإسكندرية