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( Tei index)

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Vivid 3  
(2D)

MPI

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Archive of SID

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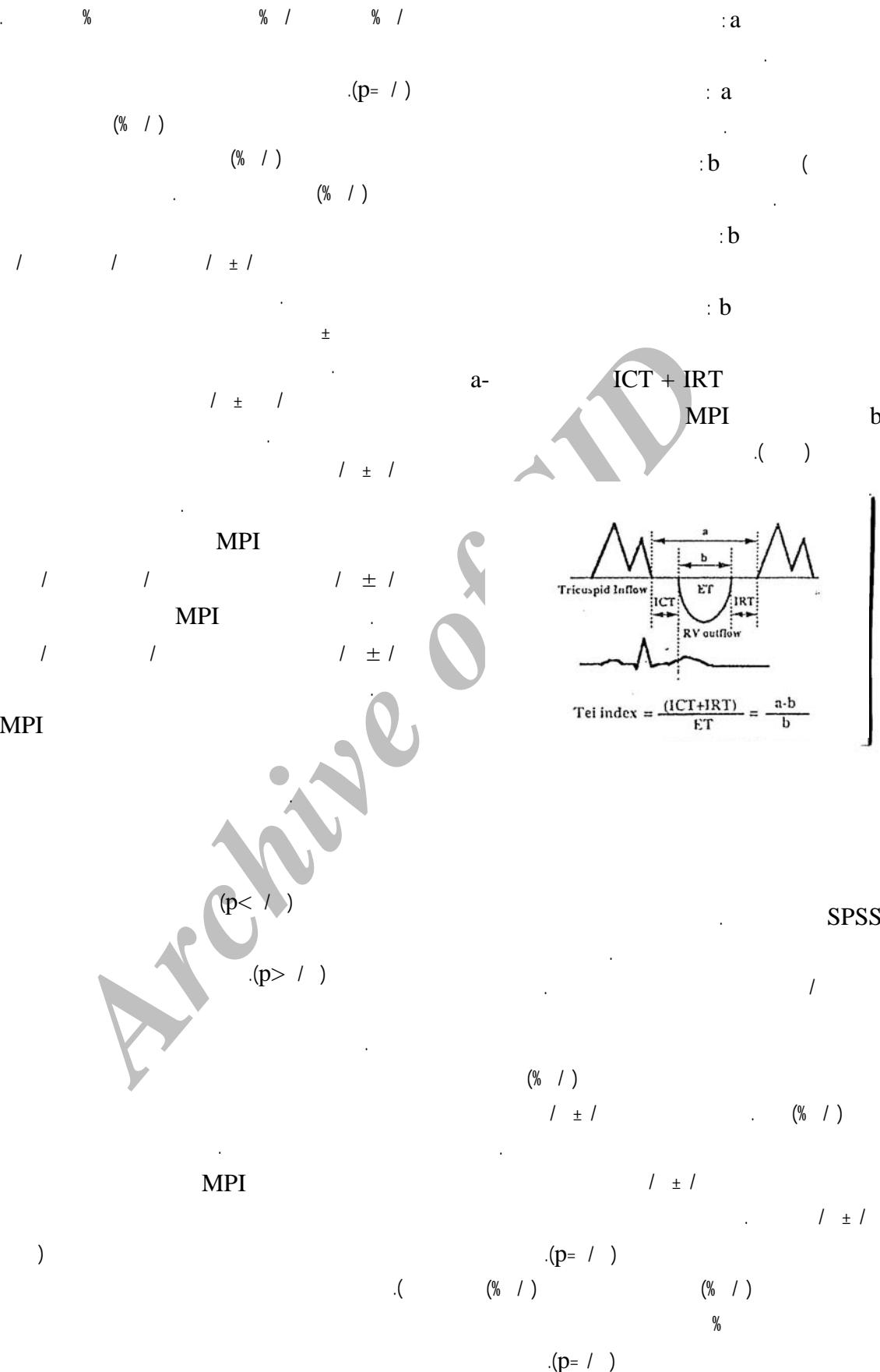
a ( MPI  
( IRT+<sup>3</sup>ET+<sup>4</sup>ICT)

Ejection Time

Isovolumic Contraction Time

Isovolumic Relaxation Time

Myocardial Performance Index



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MPI

MPI  
. (p= / )

r	Pvalue	r	Pvalue	
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MPI

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MPI

MPI

MPI  
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MPI

MPI

/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	LV_MPI
Ns	< /	< /	< /	< /	Ns		P. value

MPI

/ ± /	/ ± /	/ ± /	/ ± /	LV_MPI
< /	Ns	< /		P. value

( )MPI

Archive of SID

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E/A

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MPI

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MPI

ICT

IRT

( )

MPI

IRT+ICT

MPI

ET

MPI

MPI

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[E,A]

( )

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**MPI****E/A**

%

%

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**References:**

- 1- Behrman. Richard E., Kliegman Robert M., Jenson Hal B.: Nelson Textbook of Pediatrics. 16th ed, Philadelphia, Pennsylvania 19106. WB Saunders Company, 2000; 1484-1487.
- 2- Braunwald Eug, Fauci. Anthony S., Kaspe Dennis L.: Harrison's principles of internal medicine, 15th edition; New York, Mc Graw Hill companies, 2001; 672-673.
- 3- Hoffman R., Schwart E., et al: Basic principles and practical of Hematology. Churchill Livingston, 1991; 368.
- 4- Nancy F., Oliver and Dj Weatherall: Pediatric Hematology. Second ed, 1999; 307-326.
- 5- Oski Frank A., Nethan. David G.: Hematology of infancy and childhood. 4th ed, W.B. Saunders Company, 1993; 838-840.
- 6- Braunwald Eug., Libby Pe., Zipes Dou.: Heart disease a textbook of cardiovascular Medicine. 6th ed, Philadelphia, London, New York, St. Louis, Sydney, Toronto, W.B. Saunders Company, 2001; 2223-2227.
- 7- Kurysherv Yuri A., Britlenham Gary M., Fujioka Hisashi.: Decreased sodium and increased Transient Outward potassium currents in Iron-Loaded cardiac Myocytes, Implication for the Arrhythmogenesis of Human siderotic heart disease. Circulation. August 10, 1999; 100 (6): 675-683.

- 8- Kermastinos, Dimitrios Th., Tiniakos, George, Theodorakis George N.: Myocarditis in Beta Thalassemia Major, A cause of heart Failure. Circulation. January 1995; 91(1): 66-71.
- 9- Hou J.W., Wu M.H., Lin K.H.: Prognostic Significance of Left Ventricular Diastolic Indexes in Beta-thalassemia Major. Arch. Pediatr Adolesc Med, Aug 1994; 148(8): 862-6.
- 10- Halalis G., Manolis A.S., Gerasimidou I.: Right Ventricular Diastolic Function in Beta-thalassemia Major, Echocardiographic and Clinical Correlates. American Heart Journal, Mar 2001; 141(3): 428-34.
- 11- Trikas A., Tentolouris K., Katsimaklis G., Antoniou J.: Exercise Capacity In-Patients with Beta-thalassemia Major. Relation to Left Ventricular and Atrial Size and Function American Heart Journal, Dec 1998; 36(6): 988-90.
- 12- Yesilipek M.A., Hazar V., Yegin O.L.: Carnitine Treatment in Beta-thalassemia Major. Acta Haematol, 1998; 100: 162-3.
- 13- Karvounis H.I., Zaglavara T.A., Parharidis G.E.: An Angiotensin Converting Enzyme Inhibitor Improves Leftventricular Systolic and Diastolic in Transfusion Dependent patients with Beta-thalassemia Major. Am. Heart Journal, Aug 1994; 148(8): 862-6.
- 14- Dreyer W.J., Mayer D.C., Neish S.R.: Cardiac Contractility and Pump Function. The Science and Practice of Pediatric Cardiology. 2nd edition, 1998; 220-223.
- 15- Senni M., Tribouilloy C.M., Rodehffer R.J., et al: Congestive Heart Failure in the Community. A Study of All Incident Cases in Olmsted County, Minnesota, 1991 Circulation, 1998; 98: 2282-9.
- 16- Vasan R., Levy D.: Defining Diastolic Heart Failure. A Call or Standardized Diagnostic Criteria. Circulation 2000; 101: 2118-21.
- 17- S.R. Ommen, R.A. Nishimura: A clinical approach to the assessment of left ventricular diastolic function by doppler echocardiography: updates 2003, Heart 2003; 89iii18 .
- 18- Nishimura R.A., Tajik A.J.: Evaluation of diastolic filling of left ventricular in health and disease: Doppler echocardiography is the clinicians Resetla Stone. J Am Coll Cardiol, 1997; 30: 8-16.
- 19- Oldershaw P.: Assessment of right ventricular function and its role in clinical practice. Br. Heart J, 1992; 68: 12-15.
- 20- Jiang L., Levine R.A., Weyman A.E.: Echocardiographic Assessment of right ventricular volume and function. Echocardiography 1997; 14(2): 189-206.
- 21- Baker E.J., Ellam S.V., Maisey M.N.: Radionuclide measurement of left ventricular ejection fraction in infants and children, Br Heart J, 1984.
- 22- Rezai, Weiss R., Stanford W., et al: Relative accuracy of three Scintigraphic methods for determination of right ventricular ejection fraction: A correlative study with Ultrafast computed tomography. The Journal of nuclear medicine, 1991; 32: 429-435.
- 23- Friedman B.J., Waters J., Kwan O.L., et al: Comparison of magnetic resonance imaging and echocardiography in determination of cardiac dimensions in normal subjects. J Am Coll Cardiac 1985; 5: 1369-76.
- 24- Nagel E., Schnieder U., Schalla S., Ibrahim T., et al: Magnetic

- resonance real-time imaging for evaluation of left ventricular function. *J cardiovasc Magn Reson*, 2000; 2: 7-14.
- 25- Acar P., Marx G.R., Saliba Z., et al: Three-Dimensional echocardiographic measurement of left ventricular strok volume in children: comparison with doppler method. *Pediatr Cardiac*, 2001; 22: 116-120.
- 26- Mancini G.B., Costello D., Bhargava V., et al: The isovolumic index: A new noninvasive approach to the assessment of left ventricular function in man. *Am J Cardiol*, 1982; 50: 1401-1408.
- 27- Tei C., Ling L.H., Hodge D.O., et al: New index of combined systolic and diastolic Myocardial performance: a simple and reproducible measure of cardiac function, a study in normals and dlilated cardiomyopathy. *J Cardiol* 1995; 26: 377-366.
- 28- Dujardin K.S., Tei C., Yeo T.C., et al: Prognostic value of a doppler index combining systolic and diastolic performance in idiopathic-dilated cardiomyopathy. *Am. J. Cardial*, 1998; 1071-1076.
- 29- Eto G., Ishii M., Tei C., Tsutsumi T., et al: Assessment of global left ventricular function in normal children and in children with dilated cardiomyopathy. *J. Am. Soc Echocardiogr*, 1999; 12: 1058-1064.
- 30- Moller J.E., Sondergourd E., Poulsen S.H., Egstrup K.: The doppler echocardiographic Myocardial performance index predicts left ventricular dilation and cardiac death after Myocardial infarction. *Cardiology*, 2001; 95(2): 105-111.
- 31- Poulsen S.H., Jensen S.E., Nielsen J.C., et al: Serial changes and prognostic implications of doppler-derived index combined left ventricular systolic and diastolic Myocardial performance in acutre Myocardial infarction. *Am J Cardial*, 2000; 85(1): 19-25.
- 32- Tei C., Dujardin K.S., Hodge D.O., et al: Doppler index combining systolic and diastolic Myocardial performance: clinical value in cardiac amyloidosis. *J Am Coll Cardiol*, 1996; 28(3): 658-664.
- 33- Yeo T.C., Dujardin K.S., Tei C., et al: value of a doppler driven index combining systolic and diastolic time intervals in predicting outcome in primary pulmonary hypertension. *Am J Cardiol*, 1998; 81: 1157-1161.
- 34- Ishii M., Tei C., Tsutsumi T., et al: Ouantitation of global right ventricular function in children with normal heart and congenital heart disease: *Pediatr Cardiol*, 2000; 21: 416-420.
- 35- Eiden B.W., Tei C., Leary P.W., et al: Nongeometric quantitative assessment of right and left ventricular function: Myocardial performance index in normal children and patients with Ebstein anomaly. *J Am Soc Echocardiogr*, 1998; 11(9): 849-549.
- 36- Kim W.H., Otsuji Y., Yuasat, Minagoe S., Seward J.B., Tei C.: Evaluation of right Ventricular dysfunction in patients with cardiac amyloidosis using Tei index: *J Am. Soc Echocardiogra*, 2004 Jan; 17(1): 45-9.
- 37- Bruch C. Schermund, Dagres N., Katz M., Bartel T.: Tei index in cronary artery disease-validation in patients with overall cardiac and isolated diastolic dysfunction: *2 Cardiol*, 2002 Jun; 91(6): 472-80.
- 38- Dagdelen S., Eren N., Karabulut H., Coglar N.: Importance of the index of Myocardial performance in evaluation of left ventricular function:

- Echocardiography. 2002 May; 19(4): 273-8.
- 39- Poulsen S.H., Jensen S.E., Tei C., Seward J.B., et al: Value of doppler index of Myocardial performance in the early phase of acute Myocardial infarction: *J Am Soc Echocardioge*, 2001 May; 14(5): 413.
- 40- Karvounis H.I., Nouskas I.G., Farmakis T.M., et al: Evaluation of a doppler-driven index combining systolic and diastolic left ventricular function in acute MI: *Angiology*, 2004 Jan-Feb; 55(1): 21-8.
- 41- Tei C., Dujardin K.S., Hudge D.O., et al: Doppler echocardiographic index for assessment of global right ventricular function: *J Am Soc Echocardiogr*, 1996 Nov-Dec; 9(6): 838-47.
- 42- Mugerwa J.A., Kiatchoosnakan S., Restivo J., et al: The Myocardial performance index in patients with aortic stenosis: *Echocardiography*, 2002 May; 19(4): 267-72.
- 43- Kheirandish Z.: Shiraz university of medical sciences: Assessment of ventricular function in children by using the doppler driven myocardial performance index, 2002.
- 44- Yapark I., Aksit S. Ozturk, et al: Left ventricular diastolic abnormalities in children with beta Thalassemia major: a Doppler echocardiography study. *Turk J Pediatries*, 1998 Apr-Jan; 40(2): 201-9.
- 45- Morrison D.A., Ovitt T., Hammermeister K.E., et al: Functional tricuspid regurgitation and right ventricular dysfunction in palmonary hypertension. *Am J Cardiol*, 1988; 62: 108-112.
- 46- Tsutsumi T., Ishii M., Eto G., Hota M., Kato H.: Serial evaluation for myocardial performance in fetuses and neoates by a new doppler index. *Pediatr Int*, 1999; 41: 722-727.
- 47- Vogel M., Gutberlet M., Dittrich S., Hosten N., Lange P.E.: Comparsion of transthoracic three dimensional echocardiography with magnetic resonance imaging in the assessment of right ventricular volume and mass *Heart*, 1997; 78: 127-130.
- 48- Vogel M., White P.A., Redington A.N.: In vitro validation of right ventricular volume measurment by three dimensional echocardiography, *Br Heart J*, 1995; 74: 460-463.
- 49- Grossman W.: Diastolic function and congestive heart failure. *Circulation*, 1990; 81: III-I-III-7.
- 50- Harado K., Takahashi Y., Shiota T., et al: Effect of heart rate on left ventricular diastolic filling patterns assessed by doppler echocardiography in normal infants. *Am J cardiol*, 1995; 76: 634-636.
- 51- Curtiss E.I., Reddy P.S., O'Toole J.D., et al: Alterations of right ventricular systolic time intervals by chronic pressure and volume overloading. *Circulation*, 1996; 53: 997-1003.
- 52- Leighton R.F., Weissler A.M., Weinstein P.B., et al: Right and left ventricular systolic time intervals: effects of heart rate, respiration and atrial pacing, *Am J Cardiol*, 1976; 27: 66-72.
- 53- Kermastinos D.T., Tsiapras D.P., Tsetos G.A., et al: Left ventricular diastolic Doppler characteristics in beta-thalassemia major. *Circulation*, 1993 Sep; 28(3): 1127-35.