

Idiopathic Versus Pulmonary Hypertension Functional Tricuspid Regurgitation: A Retrospective Echocardiography Based Single Center Study

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Abstract: *Objective:* The present study conducted in Hamidia hospital, Bhopal, MP (Central India) with the objective is to found the similarities and difference in idiopathic versus pulmonary hypertension functional tricuspid regurgitation. *Materials and Methods:* The present study conducted in the cardiology department Bhopal, MP (Central India) during January 2009 to July 2011. It was a retrospective echo based study. Out of 10,000 consecutive cases undergoing echo CD 1203 cases of tricuspid regurgitation were found. In the present study we compare the idiopathic tricuspid regurgitation (Id-FTR) with pulmonary hypertension functional tricuspid regurgitation (PHTN-FTR). *Results and Conclusions:* The present study conducted in cardiology department Hamidia hospital, Bhopal, MP (Central India) suggests 12.03% of tricuspid regurgitation were found. On comparing Id-FTR and PHTN-FTR both were links to elderly and found predominantly in females and PASP is the important predictor in differentiating Id-FTR and PHTN-FTR in our study.

Keywords: Idiopathic FTR, Pulmonary hypertension FTR, Echocardiography

1. Introduction

Functional tricuspid regurgitation (FTR) is characterized by structurally normal leaflets and is due to the deformation of the valvulo-ventricular complex. While mild FTR is frequent and usually benign, patients with severe FTR may develop progressive ventricular dysfunction and incur increased mortality. Therefore, FTR should not be ignored, should be appropriately diagnosed and quantified by Doppler echocardiography, and should be evaluated for corrective surgical procedures.

Tricuspid regurgitation is a common echocardiographic finding. Tricuspid regurgitation can be classified as organic when it is due to intrinsic abnormality in the valve apparatus or secondary (functional) in the absence of structural abnormalities of tricuspid leaflets.

Organic TR results from structural abnormalities of TV apparatus, may be congenital or acquired and accounts for only 8-10% of all severe TRs^{1,2}. Functional TR is frequently caused by increased right ventricular (RV) afterload and is associated with advanced stages of left sided cardiac valve^{3,4} myocardial or pulmonary^{5,6} diseases, the link FTR excessive afterload of pulmonary hypertension (PHTN) is construed as a core mechanism and is the main focus of guidelines for valve diseases.⁷ Accruing reports noted FTR with normal pulmonary pressure and without overt cause, despite comprehensive workup,⁸ referred as idiopathic FTR (Id-FTR).^{9,10,11,12,13}

The present study was done to compare the idiopathic FTR and pulmonary hypertension FTR in Hamidia hospital, Bhopal, MP (Central India).

2. Materials and Methods

The present study conducted in the cardiology department Hamidia hospital Bhopal, MP (Central India) during January 2009 to July 2011. It was a retrospective echo based study. Echo CD was performed by consultant cardiologist. Among 10,000 consecutive cases undergoing echo CD 1203 cases of tricuspid regurgitation were found. In the present study we compare the idiopathic functional tricuspid regurgitation with pulmonary hypertension functional tricuspid regurgitation.

For defining Idiopathic tricuspid regurgitation (Id-FTR) eligibility criteria:

- 1) No organic tricuspid valve diseases.
- 2) PASP <50mmhg.
- 3) Absence of left ventricular systolic dysfunction (EF >50%)
- 4) Absence of pacemaker or defibrillator wire across tricuspid valve.
- 5) Absence of congenital, pericardial, endocardial or other valve diseases.

For defining pulmonary hypertension tricuspid regurgitation (PHTN-FTR):

- 1) PASP >50mmhg.
- 2) Increase in right ventricular after load associated with advanced left sided valve diseases and myocardial or pulmonary diseases (eg. cor pulmonale)
- 3) Left ventricular systolic dysfunction (EF <50%)

3. Results

In the present study, 1203 cases of tricuspid regurgitation were found in Hamidia hospital, Bhopal, MP (Central India). Of these 1203 cases 381 cases of idiopathic functional tricuspid regurgitation were found and 692 cases of

pulmonary hypertension functional tricuspid regurgitation were found. We compare the idiopathic functional tricuspid regurgitation with pulmonary hypertension functional tricuspid regurgitation as shown in table:1.

Table 1: Shows features of Id-FTR and PHTN-FTR

SL.NO.	VARIABLES	Idiopathic FTR(n=381)	PHTN-FTR(n=692)
1	AGE (>60YRS)	65±18	68±18
2	SEX	Males/Females(42.8%/57.1%)	Males/Females(43.5%/56.5%)
3.	LVSD	Absent	Present/Absent
4.	PASP	<50mmhg	>50mmhg

In the present study ,regarding age >60yrs no difference found between idiopathic FTR and pulmonaryhypertension FTR .In both Id-FTR and PHTN-FTR 68±18 yrs were commonly effected. Females were predominantly affected in both Id-FTR and PHTN-FTR.LVSD is absent in Id-FTR as compared to PHTN-FTR left ventricular systolic dysfunction is either absent or present. Regarding pulmonary artery systolic pressure (PASP),it is less than 50mmhg in case of Id-FTR and greater than 50mmhg in case of PHTN -FTR and is a important predictor of severity in case of functional tricuspid regurgitation.

4. Discussion

In the present study ,Idiopathic functional tricuspid regurgitation were found in 25.7% of 1203cases which is somewhat higher as compared to the study by Toplisky Y etal¹⁴(12%) and PHTN-FTR in the present study were found in 57.5% which is found to be higher as compared to the study by Toplisky Y etal (28.9%).

In our study, among age >60yrs most common age groups affected were 65±18yrs in patient with Id-FTR as compared to Toplisky Y etal most commonly occurs in 71.4±13.9yrs.In the present study ,most common age group affected were 68±18yrs in patient with PHTN-FTR as compared to Toplisky Y etal¹⁴ 70.4±15.3yrs.

In the present study,females were predominantly affected in both Id-FTR and PHTN-FTR as compared to the study by Toplisky Y etal¹⁴ males in Id-FTR were 31.2% and in PHTN-FTR were of 30.7%.

In our study,PASP in Id-FTR is <50mmhg and in PHTN-FTR >50mmhg as similar to the study by Toplisky Y etal¹⁴ where PASP in Id-FTR is 39.6±6.5mmhg and in PHTN-FTR it is 71.5±20.6 mmhg.

5. Conclusion

The present study conducted in cardiology department Hamidia hospital ,Bhopal,MP(Central India) suggests 12.03% of tricuspid regurgitation were found .On comparing Id-FTR and PHTN -FTR both were links to elderly and found predominantly in females and PASP is the important predictor in differentiating Id-FTR and PHTN-FTR in our study.

References

[1] Nath J, Foster E, Heidenreich PA. Impact of tricuspid regurgitation on long-term survival. *J Am Coll Cardiol* 2004;43:405 –409.

[2] Mutlak D, Lessick J, Reisner SA, Aronson D, Dabbah S, Agmon Y.Echocardiography-based spectrum of severe tricuspid regurgitation: the frequency of apparently idiopathic tricuspid regurgitation. *J Am Soc Echocardiogr* 2007;20:405 –408.

[3] Hung J, Koelling T, Semigran MJ, Dec GW, Levine RA, Di Salvo TG. Usefulness of echocardiographic determined tricuspid regurgitation in predicting event-free survival in severe heart failure secondary to idiopathic-dilated cardiomyopathy or to ischemic cardiomyopathy. *Am J Cardiol.* 1998;82:1301–1303.

[4] Ubago JL, Figueroa A, Ochoteco A, Colman T, Duran RM, Duran CG.Analysis of the amount of tricuspid valve anular dilatation required to produce functional tricuspid regurgitation. *Am J Cardiol.* 1983;52:155–158.

[5] Hung J. The pathogenesis of functional tricuspid regurgitation. *SeminarThorac Cardiovasc Surg.* 2010;22:76 –78.

[6] Galie N, Hoepfer MM, Humbert M, Torbicki A, Vachiery JL, Barbera JA,Beghetti M, Corris P, Gaine S, Gibbs JS, Gomez-Sanchez MA, Jondeau G, Klepetko W, Opitz C, Peacock A, Rubin L, Zellweger M, SimonneauG. Guidelines for the diagnosis and treatment of pulmonary hypertension:*Eur Heart J.* 2009;30:2493–2537.

[7] Bonow RO, Carabello BA, Kanu C, de Leon AC Jr, Faxon DP, FreedMD, Gaasch WH, Lytle BW, Nishimura RA, O’Gara PT, O’Rourke RA,Otto CM, Shah PM, Shanewise JS, Smith SC Jr, Jacobs AK, Adams CD,Anderson JL, Antman EM, Faxon DP, Fuster V, Halperin JL, HiratzkaLF, Hunt SA, Lytle BW, Nishimura R, Page RL, Riegel B. ACC/AHA2006 guidelines for the management of patients with valvular heartdisease: *Circulation.* 2006;114:e84 – e231

[8] Morgan JR, Forker AD. Isolated tricuspid insufficiency. *Circulation.*1971;43:559 –564.

[9] Mutlak D, Aronson D, Lessick J, Reisner SA, Dabbah S, Agmon Y.Functional tricuspid regurgitation in patients with pulmonary hypertension:Is pulmonary artery pressure the only determinant of regurgitation severity? *Chest.* 2009;135:115–121.

[10] Girard SE, Nishimura RA, Warnes CA, Dearani JA, Puga FJ. Idiopathic annular dilation: a rare cause of isolated severe tricuspid regurgitation.*J Heart Valve Dis.* 2000;9:283–287.

[11] Iga K, Konishi T, Matsumura T, Miyamoto T, Kijima K, Gen H.Markedly enlarged right atrium associated with physical signs of tricuspid regurgitation—a cause of congestive heart failure in the elderly. *Jpn Circ J.* 1994;58:683– 688.

[12] Yamasaki N, Kondo F, Kubo T, Okawa M, Matsumura Y, Kitaoka H,Yabe T, Furuno T, Doi Y. Severe tricuspid regurgitation in the aged:Atrial remodeling

associated with long-standing atrial fibrillation. J
Cardiol. 2006;48:315–323.

[13] Kasai A, Nishikawa H, Ono N, Unno M, Kakuta Y,
Hamada M, Nakano T. [Clinical evaluation of severe
idiopathic tricuspid regurgitation]. [Article in Japanese.]
J Cardiol. 1990;20:937–944.

[14] Yan Topilsky, Amber Khanna, Thierry Le
Tourneau, Soon Park, Hector Michelena, Rakesh Suri,
Douglas W. Mahoney, Maurice Enriquez-
Sarano. Clinical Context and Mechanism of Functional
Tricuspid Regurgitation in Patients With and Without
Pulmonary Hypertension : Circulation Cardiovasc
Imaging. 2012;5:314-323.