Paolo Marino

Curriculum vitae

PERSONAL DATA

Married, 3 sons

BIO AND EDUCATION

Born in Verona, on January 14th, 1948. Medical School at the University of Bologna; graduated (cum laude) in 1972. National Board in Cardiology at the University of Padua in 1975. Clinical fellow c/o Cardiac Dept. Brompton Hospital (London) from December 1975 to March 1976. Research fellow c/o the Division of Cardiology, Johns Hopkins Hospital (Baltimore) from August 1985 to May 1987. Since November 1999 he has been Associate Professor in Cardiology at the University of Verona. His major research interest is post myocardial infarction ventricular remodeling and function. He has been Member of the National Board of the Italian Society of Cardiology and Chairman of the Working Group on Myocardial Function of the European Society of Cardiology. From December 1998 to December 2004 he has served as Chief of the Cardiology Service of the hospital of the University of Verona Policlinico "GB Rossi". Since December 2004 he has been appointed as Chief of Clinical Cardiology at the , Università del Piemonte Orientale, in Novara. Full professor of Cardiology since June 2006 and President of the Italian Society of Cardiology for the years 2009-2010.

UNIVERSITY CAREER

2006-2016	Full Professor, Università del Piemonte Orientale
2004-2006	Associate Professor, , Università del Piemonte Orientale
1999-2004	Associate Professor, Università di Verona

SCIENTIFIC POSITIONS

2010-2016	Fellow American College of Cardiology
2006-2016	Fellow European Society of Cardiology (ESC)
2004-2016	Board member "Journal Cardiovascular Medicine"
2009-2010	President, Italian Society of Cardiology (SIC)
2007-2008	Board member, Italian Society of Cardiology (SIC)
2001-2002	Chairman Working group "Myocardial function" European Society of Cardiology
1999-2002	Board member, Italian Society of Cardiology (SIC)

1985-1987	Research Fellow, Johns Hopkins University, Baltimore, USA
1976	Research Fellow, Brompton Hospital, London, UK

MAIN FIELDS OF INTEREST

1. Post-infarction ventricular remodelling
2. Cardiac mechanics
3. Diastolic dysfunction
4. Noninvasive imaging
5. Heart failure

CURRENT ISSUES OF RESEARCH

1. ***Quantitative assessment of atrial conduit function.***

   Background : Heart failure (HF) epidemic has increased need for accurate diastolic dysfunction (DD) quantitation. Cardiac MRI can elucidate left atrial (LA) phasic function, and accurately quantify its conduit contribution to left ventricular (LV) filling, but has limited availability. We hypothesized that the percentage of LV stroke volume due to atrial conduit volume (LACV), as assessed using 3D-echocardiography, can differentiate among progressive degrees of DD in HF patients. Conclusion: Our study confirms that LACV contribution to stroke volume increases along with worsening DD, as assessed in the context of (near) constant-volume four-chamber heart physiology. Thus, LACV can serve as new parameter for DD grading severity in HF patients.

2. ***A systematic review of diastolic stress tests in heart failure with preserved ejection fraction.***

   Cardiac function should be assessed during stress in patients with suspected heart failure with preserved ejection fraction (HFPEF), but it is unclear how to define impaired diastolic reserve.To meet the clinical requirements of performing stress testing in elderly subjects, we propose a ramped exercise protocol on a semi-supine bicycle, starting at 15 W, with increments of 5 W/min to a submaximal target (heart rate 100–110 b.p.m., or symptoms). Measurements during submaximal and recovery stages should include changes from baseline in LV long-axis function and indirect echocardiographic indices of LV diastolic pressure.

3. ***Systolic heart failure and cardiac resynchronization: a focus on diastole***

   Background :Conflicting data exist about the effects of cardiac resynchronization therapy (CRT) on diastolic function (DF). Aim of the study was to assess if and how CRT affects DF in systolic heart failure patients. We also investigated potential relations between CRT-induced left ventricular changes and the composite clinical endpoint of progressive heart failure and cardiac death over 3 years follow-up. 119 CRT patients underwent clinical evaluation and echocardiography before CRT and 4 months later. DF was quantified by transmitral velocities [E/A waves, deceleration time (DT), E/DT], early diastolic mitral annulus velocity (E'), E/E' ratio and 2-D speckle tracking strain rate during isovolumetric relaxation (IVR, SRivr). End-diastolic pressure-volume relationship (EDPVR)

was also assessed noninvasively using a single-beat method. Overall stiffness was quantified by ventricular stiffness (Klv) normalized to end-diastolic volume (EDV). Conclusion: Ventricular reverse remodelling, together with improvement in ventricular filling, rather than improvements of systolic function, predict clinical prognosis long-term post-CRT.

4. **Cardiac dyssynchrony quantitated by temporal uniformity of strain: implications for resynchronization therapy.**
   Background :The standard deviation of time to peak strain (TPS-SD) has been proposed as an index of left ventricular (LV) dyssynchrony in patients to be resynchronized. However, TPS-SD is sensitive to noise, and the influence of outliers on TPS-SD is also relevant. Alternatively, dyssynchrony can be indexed by temporal uniformity of strain (TUS), whereby a time plot of regional strains, arranged for LV location, is subjected to Fourier analysis. If segments shorten simultaneously (synchronously), the plot appears as a straight line, with power only in the zero-order Fourier term, whereas regionally clustered dyssynchrony generates an undulating plot with higher power in the first-order term. TUS index reflects zero-order relative to first-order plus zero-order power. Conclusion: Dyssynchrony indexed by circumferential TUS yields greater CRT benefits than that indexed by TPS-SD, supporting the idea of targeting TUS-measured dyssynchrony as a more informative quantitative measurement in CRT patients.

5. ***Noninvasively estimated left atrial stiffness is associated with short-term recurrence of atrial fibrillation after electrical cardioversion.***
   Background: As atrial stiffness (K_{la}) is an important determinant of cardiac pump function, better mechanical characterization of left atrial (LA) cavity would be clinically relevant. Pulmonary venous ablation is an option for atrial fibrillation (AF) treatment that offers a powerful context for improving our understanding of LA mechanical function We hypothesised that a relation could be detected between invasive estimation of K_{la} and new non-invasive deformation parameters and traditional LA and LV function descriptors, so that K_{la} can be estimated non-invasively. We also hypothesised that a non-invasive surrogate of K_{la} would be useful in predicting AF recurrence after cardioversion. Conclusion: K_{la} can be assessed invasively in patients undergoing AF ablation and it can be estimated non-invasively using LV strain. AF recurrence after cardioversion tends to be highest in highest quartile of computed-K_{la}.

TOP FIVE PAPERS

- Increasing degrees of left ventricular filling impairment modulate left atrial function in humans. A Prioli, P Marino, L Lanzoni, P Zardini. The American journal of cardiology 82 (6), 756-761
- Effect of streptokinase on left ventricular modeling and function after myocardial infarction: the GISSI (Gruppo Italiano per lo Studio della Streptochinasi nell'Infarto Miocardico) Trial. P Marino, L Zanolla, P Zardini. Journal of the American College of Cardiology 14 (5), 1149-1158
- Recommendations for the evaluation of left ventricular diastolic function by echocardiography. SF Nagueh, CP Appleton, TC Gillebert, PN Marino, JK Oh, OA Smiseth, Journal of the American Society of Echocardiography 22 (2), 107-133

- Pressure-volume analysis as a method for quantifying simultaneous drug (amrinone) effects on arterial load and contractile state in vivo. DA Kass, R Grayson, P Marino. Journal of the American College of Cardiology 16 (3), 726-732
- Cardiac dyssynchrony quantitated by time-to-peak or temporal uniformity of strain at longitudinal, circumferential, and radial level: implications for resynchronization therapy. B Bertola, E Rondano, M Sulis, G Sarasso, C Piccinino, G Marti,. Journal of the American Society of Echocardiography 22 (6), 665-671

FURTHER INFORMATION

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