Author's response to reviews

Title: Echocardiography-based Left Ventricular Mass Estimation. How Should We Define Hypertrophy?

Authors:

Murilo Foppa (mfoppa@cpovo.net)
Bruce B Duncan (bbduncan@orion.ufrgs.br)
Luis EP Rohde (lerohde@terra.com.br)

Version: Date: 8 June 2005

Author's response to reviews:

June 7, 2005

To:
Dr Eugenio Picano
Editor-in-Chief
Cardiovascular Ultrasound
www.cardiovascularultrasound.com

Dear Dr. Picano:

We were pleased that our review paper is of interest to the editorial board of the CU Journal. All three reviewers added important suggestions to the manuscript and we believe that the revised paper was greatly strengthened and now is closer to its main objective of a broad revision in the subject. We have addressed all comments and suggestions, modified the text to make it clear and instructive, and incorporated most of the suggested information, individually discussed below. The technical review was also of great value, and we adjusted the paper according to the instructions. Due to the informative aspect of our review and to facilitate future readers to consult the original data, we did not shorten substantially the reference list.

We hope that our revision had approached the CU Journal standard, and if not, we will be pleased to make further adjustments.

Sincerely yours,

Murilo Foppa MD, ScD
Cardiovascular Division
Hospital de Clínicas de Porto Alegre
Porto Alegre, Brazil

REVIEWER 1:

Confidential comments to editors
--------------------------------------
The review is very interesting and easy to read. Several aspects described can be very useful in the ultrasound practice. Few points have to be better addressed and discussed. The article can be very appealing for a scientific journal polarized on cardiac ultrasounds.

Reviewer's report
-----------------
General

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

Discretionary Revisions (which the author can choose to ignore)

Level of interest: An article of outstanding merit and interest in its field
Advice: Accept after minor essential revisions
Quality of written English: Acceptable
Statistical review: No, the manuscript does not need to be seen by a statistician.
Competing interests

Very good point of view about echocardiography-based LV mass estimation. The review is very comprehensive and easy to read.

Major Concerns

1. To date, two-dimensional echocardiography has a better feasibility than standard M-mode echocardiographic for determination of LV mass into reference laboratories (see and reference papers of both Devereux and Gottdiener (J Am Coll Cardiol 1995;25:424-430) of the last years). 2D assessment makes possible the calculation of LV mass even in very obese patients (e.g., see data from the Strong Heart Study where the mean BMI is even more than 30 Kg/m2)

A: He considered in the text bidimensional imaging a good strategy for echocardiographic evaluation, however both bi- and M-mode are limited by inadequate imaging. We considered that most of population-based published data are M-mode based and also that bi-dimensional is more time and technical demanding. So, we choose to focus on M-mode, favoring applicability and generalizing. (Justified in page 4 and reference in page 6 [6]).

2. Please, specify better how the indexation of LV mass for height and derivates (e.g., height powered to 2.7) rises from the need to do not underestimate LVH in overweight and obese patients, both very frequent conditions in the hypertensive population.

A: We do agree with this opinion and improved the text to make it clearer (page 10).

3. About reproducibility of LV mass, it is important to give opportune citation of two studies, the PRESERVE (J Am Coll Cardiol 199934(5):1625-1632) and RES (J Hypertens 1999;17:1955-1963), where the variability of measurements for LV mass has been opportunely assessed.

A: We initially intended to discuss the variability of each "measurement step" in its respective topics, however, we created and specific topic "reproducibility" and incorporated the suggested additional information.

4. It is also important report some experiences from different groups (Mujesan ML, Verdecchia P, Devereux RB ? LIFE Study) which clearly demonstrated that LVM reduction corresponds to reduction of cardiovascular risk. In particular, recent data from the LIFE Study (Am J Med 2004 and others) are very comprehensive in this regards and need opportune discussion.

A: It was not our primary intention to appraise the use of LVH as a surrogate endpoint in hypertension treatment. However, the suggestion to incorporate LVH regression data strengthens LV mass measurements as a clinically relevant endpoint (page 12).

5. A very recent experience has demonstrated the importance to calculate age-normalized values of relative diastolic wall thickness to define correctly left ventricular geometric patterns (Hypertension. 2005 Jan;45(1):64-8. Epub 2004 Nov 22). These findings have to be considered carefully. In addition, it is important also to specify further the impact of LV concentric remodeling, as a pre-hypertrophic stage, on prognosis (Koren M,ann Intern Med, Verdecchia, JACC).

A: We included the information of age-adjusted wall thickness, although the magnitude of this adjustment
may be diluted by other sources of variability, as body-size and blood pressure levels, which may also vary with aging. Concerning concentric remodeling, our position is somehow conservative. As we can see in text, in Verdecchia study, they studied only those without hypertrophy, and in Krumholz, published simultaneously, the impact of increased RWT was minimized after adequate LV mass adjustments. Verdecchia could not find the independent role of increased RWT in those with hypertrophy. Considering this, RWT appears to be an earlier risk factor (with probably less impact), before the presence of LVH. But the cornerstone, in our point of view, is the adequate adjustment for body size to classify patients in geometric patterns, or to use the "inappropriate hypertrophy" strategy.

REVIEWER 2

Reviewer's report

General
the authors give us a complete review of the methods for the evaluation of left ventricular hypertrophy with a exhaustive background.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)
The authors would have to give specific indications and explaining their point of view in the conclusions and practice guidelines for a simple and effective application of the echocardiography for the stratification of LVH. Can be useful a operative diagnostic algorithm from ECG and echo to RMI to identify patients with LVH and anomalous remodelling.
In discussing the relative merits of other imaging techniques, authors should discuss the higher cost of CT and MRI when compared to echo (Pennell D et al, Eur Heart J 2004) and the radiation burden of scintigraphy (equivalent to 500 chest x-rays) and CT (Picano E, British Medical Journal, March 2004)
A: We included in the conclusion one paragraph with practical recommendations to echocardiographic LVH measurement. Those with distorted ventricles are usually evaluated individually or separately in population-based studies, since most of them have prevalent cardiovascular disease with already worst prognosis, so, we decided not to discuss them specifically.
The costs and risks were subjectively stated. We tried to make it clearer in this version.

Level of interest: An article of importance in its field