Thus, we were able to calculate the mean difference instead of the standardized mean difference of the parameters of interest (PAJV and AVA). Although our results are similar to those of the original meta-analysis, even after including the SEAS study, we have enclosed the correct methodology to arrive at the conclusion.

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References

1. Takagi H, Kawai N, Umemoto T. Do statins delay the progression of aortic stenosis? *J Thorac Cardiovasc Surg.* 2009;137:e6-9.
2. Rossebø AB, Pedersen TR, Boman K, Brudi P, Chambers JB, Egstrup K, et al. Intensive lipid lowering with simvastatin and ezetimibe in aortic stenosis. *N Engl J Med.* 2008;359:1343-56.
3. Bellamy MF, Pellikka PA, Klarich KW, Tajik AJ, Enriquez-Sarano M. Association of cholesterol levels, hydroxymethylglutaryl coenzyme-A reductase inhibitor treatment, and progression of aortic stenosis in the community. *J Am Coll Cardiol.* 2002;40:1723-30.
4. Mohler ER III, Wang H, Medenilla E, Scott C. Effect of statin treatment on aortic valve and coronary artery calcification. *J Heart Valve Dis.* 2007;16:378-86.

doi:10.1016/j.jtcvs.2009.07.050

Reply to the Editor:

We appreciate the comments by Vedamurthy and associates¹ on our meta-analysis.² The standardized mean difference (SMD) is used as a summary statistic in meta-analyses when the studies all assess the same outcome but measure it in a variety of ways (eg, all studies measure depression, but they use different psychometric scales).³ Vedamurthy and colleagues stated that there were some errors in the calculation of the summary estimate: the units for aortic valve area (AVA) and peak aortic jet velocity (PAJV) had been mixed in the calculations. Similar summary estimates, however, can be commonly found in published meta-analyses. In a meta-analysis of negative pressure wound therapy,⁴ for instance, a change

in wound area per day (in square centimeters), a change in wound area until surgical closure (in square centimeters), and a relative change in wound area until surgical closure or hospital discharge (in percentages) were combined by using the SMD method. Although Vedamurthy and associates¹ projected the AVA and PAJV change per year by using the baseline values and percentage change data expressed in the original articles, precise calculation methods were not mentioned. Was the mean of the absolute change in the AVA or PAJV calculated by multiplying the mean of the baseline value by the mean of the percentage change? It is mathematically obvious, however, that the mean of the absolute change is not equal to the product of the mean of the baseline value by the mean of the percentage change. Furthermore, how was the standard deviation (SD) of the change in the AVA or PAJV? The SD of the absolute change also cannot be equal to the product of the mean of the baseline value by the SD of the percentage change. We do not have the slightest doubt that the SMD method using the absolute and percentage changes themselves expressed in the original article is better than the simple mean difference method using the absolute changes that are complexly calculated by authors of a meta-analysis. However, we would like to know how Vedamurthy and associates calculated the mean or SD of the absolute change.

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References

1. Vedamurthy D, Molnar J, Arora R. Aortic stenosis and statins. *J Thorac Cardiovasc Surg.* 2009;138:1254-5.
2. Takagi H, Kawai N, Umemoto T. Do statins delay the progression of aortic stenosis? *J Thorac Cardiovasc Surg.* 2009;137:e6-9.
3. Deeks JJ, Higgins JP, Altman DG, editors. Analysing data and undertaking meta-analyses. In:

Higgins JPT, Green S, editors. *Cochrane Handbook for Systematic Reviews of Interventions* Version 5.0.1 (updated September 2008). The Cochrane Collaboration, 2008. Available at: www.cochrane-handbook.org.

4. Gregor S, Maegele M, Sauerland S, Krahn JF, Peinemann F, Lange S. Negative pressure wound therapy: a vacuum of evidence? *Arch Surg.* 2008;143:189-96.

doi:10.1016/j.jtcvs.2009.07.051

TRANSCATHETER HEART VALVE OPTIMAL SIZE

To the Editor:

We read with interest the comments of Zegdi and colleagues¹ on our article entitled “Surgical aortic valve replacement after percutaneous aortic valve implantation: what have we learned?”² The authors raised several important questions about transcatheter heart valve (THV) size selection according to the aortic annular diameter and the issue of oversizing. In the case reported a 23-mm balloon expandable Cribier-Edwards THV had been selected for an aortic annulus measured to 20 mm by using echocardiographic analysis (2 mm of oversizing), which was in agreement with the Edwards company’s recommendations. After THV implantation, it clearly appeared that the THV size was too small, explaining the subsequent severe paravalvular leak leading to surgical valve replacement.

Retrospectively, it seems that the transthoracic echocardiographic (TTE) and transesophageal echocardiographic (TEE) measurements definitely underestimated the annular diameter. A 26-mm THV size should have been implanted in this patient, as in any similarly tall male patient. The lack of annular ring in the stented THV device might explain the difference with the bioprosthesis size (23 mm) surgically implanted in this patient. The accuracy of annular size echocardiographic measurement is a technical issue, which has been solved thereafter. This patient was our second case included in the first multicenter European Registry of Endovascular Implantation of Valves in

Europe (REVIVE) trial in 2007, and we must admit that since then, we have learnt a lot about annular size measurement by means of echocardiographic analysis.

A precise measurement of the annular size is definitely crucial to avoid THV/annulus mismatch, and the assessment still relies on the annular diameter measurement obtained by means of TTE, TEE, or both in the long-axis view at the leaflet insertion site. This was not clear enough in 2007.

The authors say that a “dramatic incidence of severe aortic regurgitation” was noted in our first pioneering experience with the antegrade transseptal approach, but this was due to the unique 23-mm THV available at that time. The incidence of severe leaks has markedly decreased thereafter with the launch of the 26-mm THV, the refinement of the screening process, and the availability of the transapical approach in case of suboptimal femoroiliac access (4.7% of grade ≥ 2 aortic regurgitation in the latest European Source Registry, 2009).

The updated THV size recommendations are as follows: 23-mm THV for an annulus of 18 to 21 mm (2–5 mm of oversizing) and 26-mm THV for an annulus of 21 to 25 mm (1–5 mm of oversizing). Selecting the THV size is thus easy when the diameter is found to be less than 20 mm or greater than 22 mm but might still be an issue in intermediate cases.

Even in experienced hands, the precision of echocardiographic measurements is not perfect. TTE, which is used by many investigators, is supposed to be less accurate than TEE, and generally measures a diameter smaller by 1 mm. Additional tools can be used when the diameter is found to be nearly 21 mm, but computed tomographic scanning and magnetic resonance imaging are not reliable and overestimate the annular size by 2 or 3 mm. In borderline cases the best solution seems now to combine valve predilatation with a 23-mm balloon and simultaneous supra-aortic angiographic analysis, which is actually routinely done. The

observed gap between balloon sides and the aortic wall, as well as any degree of aortic regurgitation at full balloon inflation, are very helpful to determine the optimal THV size. These approaches are actually very effective, as assessed by the marked decrease in severe aortic regurgitation.

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References

1. Zegdi R, Achouh P, Blanchard D, Lafont A, Fabiani JN. Percutaneous aortic valve implantation: what does oversizing mean? *J Thorac Cardiovasc Surg.* 2009;138:260.
2. Litzler PY, Cribier A, Zajarias A, Comte D, Eltchaninoff H, Tron C, et al. Surgical aortic valve replacement after percutaneous aortic valve implantation: what have we learned? *J Thorac Cardiovasc Surg.* 2008;136:697-701.

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