Correspondence

This letter was shown to one of the authors, who replies as follows:

Sir,

We are grateful to Dr de Mey and Dr Belz for their interesting and constructive comments. In our paper we did not propose, nor did we intend to imply, that the technique of impedance cardiography should be "generally rejected" simply because of the poor results obtained with the BoMed NCCOM3. Indeed we accept that the technique may possibly provide useful semiquantitative information about stroke volume if operated within the constraints so clearly outlined by our West German colleagues.

However, we believe most of the published reports that at first sight seem to confirm the validity of impedance cardiography may require critical reappraisal. The main problem is that the cardiac output of any individual is related to his body size and heart rate. The empirical formulas used in impedance cardiography were designed to determine stroke volume and they include variables related to the subject's size (the base impedance and thoracic length). Most of the published studies have compared measurements of cardiac output obtained by impedance techniques with another measure of cardiac output: such an approach will inevitably show a correlation. We believe that any critical analysis of impedance cardiography must remove the effects of heart rate and body size by examining stroke volume index. Such studies have been few and, in general, they have failed to confirm the validity of impedance methods.12 (Despite its title reference 2 does not confirm the validity of the technique.)

Clearly, further research is needed before impedance measurement of cardiac output can be accepted as a viable alternative to invasive methods.

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References