

### Reply to letter: So as to avoid any misunderstanding about Cure CHIVA

We would like to thank the editors of *Phlebology* for providing forum for critical analysis of the state of knowledge of venous physiology and pathophysiology. The scientific nature of the journal limits the discussion to issues related to scientific medicine, leaving the debate on content and validity of metaphysical propositions to other audiences.

The interest in CHIVA opens an opportunity to discuss some important gaps in our understanding of venous diseases. The three areas we proposed for discussion are the physiology of venous haemodynamic, the application of the physiological concepts to a broader understanding of venous disease and practical aspects of management of patients with venous disease.

The system of inter-connected veins with segments of unidirectional flow secured by valves, and avalvular segments allowing bidirectional flow is highly complex. The solutions for the net flow in such systems require computational modelling and currently cannot be solved theoretically. Even elements of this system, such as flow from a side tributary, or asymmetrical bifurcation cannot be solved by existing theoretical hydrodynamics.<sup>1</sup> This dictates the need for accumulation of a necessary body of empirical data in order to be able to formulate more general principles of venous haemodynamics. Such data are fractionated and limited at present time.

Conceptual application of fluid mechanics to a broad phenomenon of venous diseases requires caution and sophistication. Philosophical limitations of reductionism are well known to those who work within the framework of scientific medicine. In the words of the Nobel laureate P W Anderson, 'The ability to reduce everything to simple fundamental laws does not imply the ability to start from those laws and reconstruct the universe'.<sup>2</sup> Bridging from pure fluid mechanics to biological effects exemplifies an area of interdisciplinary approach. The flow-endothelium interaction is a known part of this, but many other aspects of this phenomenon have not been studied sufficiently. Examples include the active and passive behaviour of structures within venous wall, interaction between the venous wall and surrounding biological structures such as nerves and connective tissue, influence of venous flow on trans-capillary

exchange, interstitial fluid dynamics and lymphatic system. These areas remain open for investigation, potentially providing key answers to pathogenesis and effective treatment of venous diseases. Reliance on simplified theoretical constructs such as 'recirculation', 'venous hypertension', or 'transmural pressure' as a single source of explanation of the pathogenesis of venous disorders and especially in developing management strategies is at best naive if not dangerous.

Management of patients with venous diseases is the practical part of the proposed discussion. Chronic venous diseases represent a class of slowly developing chronic conditions with poorly defined natural history and lack of understanding of underlying pathology. Progress in such areas usually results from collective efforts of centres and individuals. The necessary condition is utilization of common methodology, terminology, definitions and instruments. Successful examples of such efforts are clinical, aetiological, anatomical and pathological elements classification, venous severity scores and duplex-based definition of reflux. At certain times these and other instruments need to be adjusted or even replaced. This should be based on critical analysis of empirical evidence, indicating deficiencies of existing tools, or needs for new measurements. As such evidence emerges, and if the quality of data corresponds to the currently accepted standards, discussion of possible changes should take place. Until then, proposing changes in patient management may distract so needed and limited resources from a constructive scientific process.

We hope that the discussion of three proposed areas can be helpful for progress in a challenging and developing field of phlebology.

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### References

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- 2 Anderson PW. More is different. *Science* 1972;**177**:393-6