

References

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Circulating and intra-thoracic vs stressed and unstressed volumes

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Editor—In their interesting study Vos and colleagues¹ used transpulmonary dye dilution method to measure Circulating Blood Volume (V_{circ}). The authors correctly stated that the technique underestimates the total blood volume by approximately 40% (5 min interval between injection of the dye and obtaining the blood samples for volume calculations did not allow complete dilution of the dye). This suggests that **mainly stressed blood volume** (V_s), the **blood** in the areas with **fast flow**, was measured;^{2–4} intra-thoracic veins and V_{circ} largely contain V_s. The **unstressed** volume (V_u), the volume in the parts of vasculature with **slow circulation**, largely located in the **splanchnic bed**, was not measured. As this important part of total blood volume was excluded from the measurements, an alternative interpretation of the data might be in order.

The study showed that V_{circ} and intra-thoracic blood volume were changing during hypo- and hypervolemia in parallel. Both of them, V_{circ} and intra-thoracic volume, were parts of V_s and behaved similarly during the experiments; that is what this study has demonstrated.

The main observations in the present study¹ are in agreement with the notions expressed above. For example, relatively strong correlations between values of V_{circ} and intra-thoracic volumes is not surprising because both of them represent largely V_s. As the V_s is the main determinant of mean circulatory filling pressure and therefore of venous return and cardiac output,^{5–7} it is not surprising that all changes in V_{circ}, intra-thoracic volume and cardiac output were changing in parallel.

Thus, the study demonstrated that during developing hypo- or hypervolemia, parts of **V_s shift** similarly **regardless** whether the V_s is within **V_{circ}** or **intra-thoracic vasculature**. This observation *per se* does not exclude the role of V_u in general: **splanchnic**

vasculature still **releases** or **accommodates** blood **volume** as needed, even in conditions of routine general anaesthesia.

Declaration of interest

None declared.

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