**The Effect of a Standard Blood Donation on Oxygen Uptake**

Dear Editor,

We read with interest the systematic review by Van Remoortel and colleaugues1, concluding that a standard whole blood donation reduces haemoglobin levels, VO2max and maximal exercise 24-48 hours following donation. We generally support the conclusions, but believe some results are possibly skewed, particularly regarding VO2max (24-48 hours after donation).

The article identifies that VO2max decreases by 7% from donating a unit of blood. The forest plot used in the meta-analysis of this variable uses blood donations ranging from 400ml to 500ml. It is uncertain as to how this range of data in one forest plot could provide a robust analysis. For example Ekblom, Goldbarg and Gullbring2 withdraw 400ml and Brinbaum, Dahl and Boone3 withdraw 500ml (although the review incorrectly states the amount is 450ml in their Table 1). Thus, given that on average 100ml of blood carries 15g of Hb, if the mean values of Hb are used from these two studies which are 14.9 and 15.3 g.dL-1 respectively and calculated accordingly per 100ml blood volume lost in donation then the values equate to 59.6 and 76.5 g Hb, equating to a 28.4 % difference due to volume and as such will likely have differing effects on VO2max. Indeed the decrease for VO2max is 6.4 % for Ekblom2 & 9.8% for Brinbaum3. We contend that using studies of similar blood volumes would have provided a more robust analysis.

Moreover it is felt that the previously mentioned Ekblom2 paper should not be in this forest plot, as the testing period (part of the group II work that involved sequential venesections) was 3 days after each blood loss and not the 24-48 hour period as intimated in the forest plot. If indeed this period was to be included then it could be argued that the data from Gordon and co-workers4 should be in the plot too, as their time span was 48-72 hours, thus deeming the paper eligible.

Additionally we would question the inclusion of the Foster and colleauges5 study, partly as the donation amount is 500ml (as previously discussed), but also due to additional confounding issues. Firstly it does not appear clear if the measure of pre and post blood donation VO2max/peak values were obtained from the first Graded Exercise Test (GXT) or the second GXT (when the talk test is used). Secondly, the fact that it involves a talk test (TT), (a method Foster and colleagues argue is associated with identifying ventilatory threshold) while possibly gaining VO2max/peak results compromises ecological validity, as talking while using open circuit spirometry will affect the fidelity in expired air samples. Additionally, as the participants are exercising to volitional exhaustion, the validity of the test outcome is raised, as there is a compromise between talking and concentrating on the exercise component.

Finally there is an error where the amount of participant numbers is incorrectly stated (10 should be 11) for one of the studies (Burnley and colleagues6) represented in the discussed forest plot. The impact of this is that the statistics are wrong, such as affecting the confidence intervals.

We would very much welcome a response from the authors in this regard.

Yours Sincerely,

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