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Effects of Hemopure on maximal oxygen uptake and endurance performance in healthy humans.

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Haemoglobin-based oxygen carriers (HBOCs) such as Hemopure are touted as a tenable substitute for red blood cells and therefore potential doping agents, although the mechanisms of oxygen transport of HBOCs are incompletely understood. We investigated whether infusion of Hemopure increased maximal oxygen uptake (V.O 2max) and endurance performance in healthy subjects. Twelve male subjects performed two 4-minute submaximal exercise bouts equivalent to 60 % and 75 % of V.O (2max) on a cycle ergometer, followed by a ramped incremental protocol to elicit V.O (2max). A crossover design tested the effect of infusing either 30 g (6 subjects) or 45 g (6 subjects) of Hemopure versus a placebo. Under our study conditions, Hemopure did not increase V.O (2max) nor endurance performance. However, the infusion of Hemopure caused a decrease in heart rate of approximately 10 bpm (p=0.009) and an average increase in mean (approximately 7 mmHg) and diastolic blood pressure (approximately 8 mmHg) (p=0.046) at submaximal and maximal exercise intensities. Infusion of Hemopure did not bestow the same physiological advantages generally associated with infusion of red blood cells. It is conceivable that under exercise conditions, the hypertensive effects of Hemopure counter the performance-enhancing effect of improved blood oxygen carrying capacity.

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