

Total haemoglobin mass, maximal and submaximal power in elite rowers.

Treff G(1), Schmidt W(2), Wachsmuth N(2), Völzke C(2), Steinacker JM(1).

Int J Sports Med. 2014 Jun;35(7):571-4. doi: 10.1055/s-0033-1358476. Epub 2013 Nov 14.

Elite rowers are highly endurance trained and present with a large lean body mass (LBM), which is closely related to total haemoglobin mass (tHbmass), a major determinant of blood O₂-transport. This study aims to determine the magnitude of tHbmass in elite rowers and its relation to performance parameters that are common in rowing worldwide. 13 rowers (3 lightweight) performed a 2000 m test to evaluate maximal performance on the rowing ergometer (P2k) and an incremental test to evaluate power output at lactate 2 and 4 mmol/l (N=15). tHbmass was measured by CO-rebreathing. tHbmass amounted to 1285±123 g (open weight) and 1059±48 g (lightweight). Coefficients of correlation between tHbmass and power output increased with intensity, being highest for P2k ($r=0.80$). An increase of 100 g tHbmass is associated with an increase of 24 W in P2k between subjects. The ratio between tHbmass/LBM amounted to approximately 16 g/kg. Absolute tHbmass in elite rowers of open weight class is very high. In relation to body mass or LBM, data is similar to other endurance athletes. The relation between P2k performance and tHbmass is very large. However, it is partly mediated by body composition.