

European Respiratory Society Annual Congress 2012

Abstract Number: 4904

Publication Number: P933

Abstract Group: 4.3. Pulmonary Circulation and Pulmonary Vascular Disease

Keyword 1: Circulation **Keyword 2:** Physiology **Keyword 3:** Pulmonary hypertension

Title: VO₂ equations revised: Is the use of assumed oxygen consumption acceptable?

Dr. Susanna 31141 Desole susanna.desole@i-med.ac.at MD ¹, Dr. Klemens 31142 Dolp klemens.dolp@student.i-med.ac.at MD ¹ and Prof. Christian M. 31143 Kähler c.m.kaehler@i-med.ac.at MD ¹. ¹ Department for Internal Medicine I - Pneumology, Medical University Innsbruck, Austria, 6020 .

Body: LaFarge/Miettinen's formula for the assumption of oxygen consumption (VO₂) is one of the most used in hemodynamic calculations. Considering the importance of VO₂ for the calculation of hemodynamics needed for disease evaluation (e.g. pulmonary hypertension), the need for an acceptable agreement between assumed and measured VO₂ becomes obvious. A well known variation of the original formula is the one by Bergstra. In both equations, age, sex and BSA are factors determining the VO₂, plus the heart rate (HR) in the original formula. We compared directly measured VO₂ with values calculated by both the LaFarge/Miettinen and the Bergstra equations. VO₂ of 122 volunteers (20-65y) was directly measured by the Innocor™(Innovision). VO₂ was then recalculated by both the equations. Directly measured VO₂ (VO₂^{INN}) was 363±84ml/min in males, 224±52ml/min in females. VO₂ calculated by Bergstra was 298±24ml/min in males, and 233±24ml/min in females. VO₂ by LaFarge/Miettinen was 258±24ml/min in males, 182±21ml/min in females. Direct comparison of VO₂^{INN} with calculated VO₂ showed significant differences between all the methods. Factors found to be influencing the VO₂ in our cohort included sex, HR and BSA whereas age seemed to have no effects. Significant correlations were found between VO₂ and hemoglobin, oxygen saturation (SpO₂), fitness level and systolic blood pressure. Comparison of directly measured VO₂ values with assumed data obtained by both the LaFarge/Miettinen and Bergstra equations showed that none of the formula is satisfying in terms of agreement with measured data. Using VO₂ equations may result in major bias of hemodynamics and we therefore urge that resulting data should be interpreted critically.