

ABSTRACT

NON-INVASIVE MEASUREMENT OF CARDIAC OUTPUT (CO) DURING EXERCISE IN CHRONIC HEART FAILURE (CHF)

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Introduction. In CHF CO measurement during exercise is desirable to assess severity of the disease and prognosis. Gas rebreathing (R) of two inert gases, one insoluble (SF₆) to determine lung volume and one soluble (N₂O) to measure pulmonary blood flow (equal to CO if intrapulmonary shunt flow is absent), is a non-invasive, easy and safe technique.

Methods. 20 stable CHF patients (peak oxygen consumption (VO₂) 20.2±3.1ml/min/kg) performed 3 cardiopulmonary exercise tests. The first was a ramp protocol test to assess exercise capacity, the second and the third were 4 minute-step protocol tests with workload increase based on patient exercise performance. In the second test CO was measured by R method (Innocor Innovision, DK) at rest and at each step (training test). In the third test, after insertion in the jugular vein of a 7F Swan Ganz catheter advanced to the pulmonary artery and in the radial artery of a small catheter, we measured CO simultaneously at rest and at each step with 3 techniques: R, Fick (F) and thermodilution (T).

Results. Repeatability of CO measurement by R (2nd vs 3rd test) was assessed with a variation coefficient of 10.8%. Moreover our data show a good linear correlation between CO measurements by R vs F (r=0.95) and R vs T (r=0.94) similar to the linear correlation between F and T (r=0.97).

Conclusions. Our study shows that CO measurement by R technique is repeatable and reliable at rest and during exercise in CHF.

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