THE SIX-MINUTE WALK DISTANCE IN HEALTHY NORTH AFRICAN CHILDREN AGED 6 – 16 YEARS: FACTORS INFLUENCING AND REFERENCE EQUATION.

Ben Saad Helmi¹, Hadj Mohamed Imène², Missaoui Rayfa¹, Latiri Imed¹, Zbidi Abdelkrim¹, Hayot Maurice³, Tabka Zouhair¹, Prefaut Christian³

(Service of physiology and functional explorations.¹, Tunisia, Service of physiology and functional explorations. Farhat Hached hospital. Sousse², Tunisia, Central service of clinical physiology. Arnaud de Villeneuve hospital. Montpellier.³, France)

Background: The 6-minute walk test (6-MWT) assesses the submaximal level of functional capacity by measuring the distance that a patient can quickly walk in a period of 6 minutes (6-MWD). In children, this ludic test is more reflective of activities of daily living than other running tests. The basis of interpretation of the 6-MWT relays on the comparison of the measured 6-MWD with the predicted one from a reference equation. In children, as the factors influencing the 6-MWD are not well known, as there is no reference equation, and as the ATS encourages investigators to publish reference equations for healthy persons using the 6-MWT standardized procedures, we have done this study. Materials and methods: An Arabic medical questionnaire, derived from the ATS respiratory disease questionnaire was done. The anthropometric and spirometric data [Weight and height of birth, age (yr), height (m), weight (kg), body mass index (BMI, kg.m-2), forced expiratory volume (FEV), forced vital capacity (FVC), peak expiratory flow (PEF), forced mid-expiratory flow (FEV25-75)] were determined. Peripheral oxygen saturation (sat), heart rate (Hr), systolic and diastolic pressures (SP, DP) were measured at rest (1) and at the end (2) of the 6-MWT. The 6-MWD was noted and the following parameters were calculated: Predicted maximal Hr (= 210 – 0.65 × Age), Δ SP = SP2-SP1, Δ DP = DP2-DP1, Δ Hr = Hr2-Hr1, Δ %Hr = %Hr2-%Hr1, Δ sat = sat2-sat1. Two sporting activities (sport+, sport-) and the pubertal status, based on the 5 point rating scale of Tanner were assessed. Multiples linear regressions were determined. The lower limit of normal (LLN) is defined by the 95% confidence interval, and a 6-MWD < LLN is abnormal. Results: After application of exclusion criteria, only 186 (87 boys) healthy Tunisian children among the 217 examined were retained. In boys, the factors influencing (p < 0.05) the 6-MWD are mentioned in the following 6-MWD reference equation, explaining 87% of its variability: 6-MWD (m) = 903 × Height + 17.77 × PEF + 1.97 × Δ %Hr – 14.21 × Weight + 24.61 × BMI – 2.10 × DP1 + 0.95 × SP2 – 1.23 × Δ DP + 24.84 × FVC – 650. For practice use, we recommend the use of the following reference equation, explaining 77% of the 6-MWD variability’s: 6-MWD (m) = 438 × Height – 3.62 × Weight + 7.54 × Age + 123. To calculate the LLN subtract from the predicted 6-MWD, 140 m. Conclusion: In future, and in order to interpret correctly the 6-MWD, these recommended reference equations should be used.

Keywords: Exercise Physiology, Walking

12th Annual Congress of the ECSS, 11–14 July 2007, Jyväskylä, Finland