

Physical Fitness in Omani Children with Sickle Cell Disease and Sickle Cell Trait

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Abstract : Sickle cell disease (SCD) and sickle cell trait (SCT) are the most common hematological diseases in Oman according to the national survey of genetic blood disorders. The aim of this study was to determine markers of physical fitness and anthropometrics indices in children with sickle cell disease and children with sickle cell trait and compare them with normal healthy children of the same age. One hundred and twenty male children participated in the present study divided to three groups: 40 with sickle disease (SCD; age, 13.3(.80), height, 131.9(3.5), mass, 29.2(3.1)); 40 with sickle cell trait (SCT; age, 12.2(.80), height, 141.0(9.9), mass, 38.0(4.4)); and 40 controls with normal hemoglobin (Con; age, 12.8(.80), height, 139.4(8.7), mass, 37.2(4.3)). All children completed a 5-min running exercise test on a treadmill at speed corresponding to 5 km/hr. Heart rate and was recorded during exercise and during 10-min of recovery. Blood lactate was measured before and 5 min after the completion of exercise. Children with SCD exhibited a higher mean value ($P < 0.05$) for percent body fat and fat mass than the normal healthy subjects and SCT subjects. Resting values of hemoglobin were similar in SCT (11.04(.78)) and control (10.8(94)) groups, and lower in SCD (8.89(.54); $P < 0.05$). There was a strong correlation between peak heart rate and resting hemoglobin levels for the three groups ($r = -.472$, $n = 120$, $p < .0005$). The SCD group (175.2(10.3)) exhibited higher mean heart rate during exercise than those observed in the SCT (143.7(9.5)) and normal control children (144.5(22.4); $P < 0.05$). Additionally, SCD children showed higher serum lactate values before and after treadmill exercise compared to the other groups ($P < 0.05$). Children with sickle cell trait demonstrate similar physical fitness level and similar exercise responses to treadmill stress test to normal children. In contrast, SCD children have lower body mass, higher fat mass and lower physical fitness than children with SCT and healthy controls.

Keywords : sickle cell disease, sickle cell trait, children, exercise

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