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Prognostic Values Of Heart Rate And Oxygen Saturation In Patients With Pulmonary Arterial Hypertension Before And After Six Minute Walk Test

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Objective: This study aims to determine the prognostic values of heart rate (HR) and transcutaneous oxygen saturation (Sat) which were measured before six minute walk test (6MWT), at the end of 6MWT and 5 minutes after 6MWT in children who are undergoing pulmonary arterial hypertension (PAH) specific treatment.
Methods: This is a prospective review of 29 children who were aged between 7 and 17 years, diagnosed with PAH and underwent 6MWT. Transcutaneous oxygen saturation and heart rate were measured before 6MWT, at the end of 6MWT and 5 minutes after the completion of 6MWT (Sat0, Sat1, Sat2; HR0, HR1, HR2 respectively). HR increase was defined as HR1 minus HR0 and decrease in oxygen saturation was defined as Sat0 minus Sat1.
Results: The mean age of the children was 129±45 months and the mean follow-up time was 58±40 months. The mean pro-BNP concentrations did not change significantly before and after the administration of PAH specific treatment (946.4±1754.8 pg/ml vs 917.6±1920 pg/ml p=0.11). However, the mean 6MWT distance increased significantly after the administration of PAH specific treatment (400.2±107.8 m vs 436.2±119.2 m, p=0.012). The 6MWT distance was significantly longer and HR1 was significantly higher in survivors (453.3±96.5 m vs 250±135.2 m, p=0.025 and 122.8±18.4 /min vs 94.3±19.1 /min, p=0.034). HR1 increased significantly but Sat1 and Sat2 decreased significantly after PAH specific treatment (p=0.017, p=0.03 and p=0.017 respectively). While there was no significant correlation between World Health Organization functional classification (WHO-FC) and Sat1 before treatment, WHO-FC and Sat1 correlated negatively after treatment (r=-0.435, p=0.021). Although WHO-FC and pro-BNP did not correlate before treatment, they correlated positively after treatment (p=0.0001). There was no association between survival and heart rate increase whereas survival was positively associated with the decrease in oxygen saturation. If the decrease in oxygen saturation was 14.6%, sensitivity increased to 100% and specifity was 58.3%.
Conclusions: PAH is a chronic disease which continues to progress despite the administration of specific therapy. The measurement of oxygen saturation with pulse oximeter during 6MWT might have prognostic importance in the follow up of children undergoing PAH specific treatment.