Perbandingan Fungsi Jantung Anak Thalassemia Mayor Dengan Menggunakan Ekokardiografi dan Uji Berjalan 6 Menit = The Comparison of Cardiac Function in Thalassemia Major Children Using Echocardiography and Six Minute Walk Test

Felix, author

Abstrak

[Latar belakang: Gagal jantung adalah penyebab utama kematian pada thalassemia akibat penumpukan besi dari transfusi darah. Ekokardiografi sering digunakan untuk evaluasi fungsi jantung, namun interpretasi hasilnya sangat bergantung dari operator. Uji berjalan 6 menit adalah metode sederhana yang terbukti mempunyai reliabilitas baik untuk menilai kapasitas fungsional kardiorespirasi sehingga dapat menjadi alternatif penilaian fungsi jantung anak thalassemia.
Tujuan: Mendapatkan uji berjalan 6 menit sebagai metode sederhana untuk mengukur fungsi jantung anak thalassemia.

Metode: Penelitian kasus kontrol pada subjek thalassemia dan kontrol berusia 11-18 tahun yang dipilih secara consecutive sampling. Subjek thalassemia mempunyai rerata feritin serum >2500 ng/mL dalam 6 bulan terakhir. Subjek kontrol dalam kondisi sehat dan tidak pernah menjalani transfusi darah. Uji berjalan 6 menit dilakukan pada kedua subjek, sedangkan ekokardiografi konvensional (EK) dan tissue Doppler (ETD) hanya dilakukan pada subjek thalassemia oleh seorang konsultan kardiologi anak. Data sekunder lain pada subjek thalassemia diambil dari rekam medis yaitu rerata hemoglobin pra-transfusi dalam 1 tahun terakhir, feritin serum dan saturasi transferin dalam 6 bulan terakhir.
Hasil: Sebanyak 40 subjek thalassemia dan 109 kontrol berpartisipasi dalam penelitian ini. Median usia subjek thalassemia 13,4 (11-17,9) tahun dan kontrol 14,2 (11,3-17,9) tahun. Rerata hemoglobin pra-transfusi 7,6±0,6 g/dL. Median feritin serum 4246,5 (2506-10749,7) ng/mL dan saturasi transferin 100 (50-100) %. Setelah dilakukan matching usia dan jenis kelamin, jarak tempuh uji berjalan 6 menit pada subjek thalassemia lebih pendek daripada kontrol (465,1±74,2 vs 671±94,2, p<0,001). Parameter fungsi sistolik dan diastolik jantung dari EK dalam batas normal, tetapi ETD menunjukkan 45% subjek thalassemia mengalami gangguan fungsi diastolik (rasio E/E' >8). Tidak ada faktor yang berkorelasi dengan jarak tempuh pada subjek thalassemia, sedangkan tinggi badan berkorelasi dengan jarak tempuh pada kontrol berdasarkan analisis bivariat.
Kesimpulan: Jarak tempuh antara subjek thalassemia lebih rendah daripada kontrol. Peran ETD lebih baik daripada EK dalam mengevaluasi fungsi jantung. Uji berjalan 6 menit dapat digunakan sebagai skrining fungsi jantung pada anak thalassemia.;Background: Heart failure is leading cause of mortality in thalassemia due to transfusion-induced iron overload. Evaluation of cardiac function is routinely performed with echocardiography. However, its interpretation depends on operator. The six minute walk test is a simple and reliable method to assess cardiorespiratory performance, therefore, it is suggested to be an alternative in evaluating cardiac function in thalassemia.
Aim: To obtain six minute walk test as a simple method in order to evaluating cardiac function in thalassemia.

Methods: This case control study was performed in thalassemia subjects (cases) and controls aged 11-18 year old which were selected with consecutive sampling. Cases should have mean serum ferritin level >2500 ng/mL in last 6 months. Controls must be in healthy condition and have never had blood transfusion. Both cases and controls performed six minute walk test, while echocardiography (conventional and tissue Doppler) was only done in cases by a pediatric cardiologist. Other secondary data collected from medical records in cases were mean of pre-transfusion hemoglobin in last 1 year, serum ferritin and transferin saturation in last 6 months.
Results: There were 40 cases and 109 controls involved in this study with median age were 13.4 (11-17.9) and 14.2 (11.3-17.9), respectively. The mean of pre-transfusion hemoglobin was 7,6±0,6 g/dL. The median serum ferritin was 4246.5 (2506-10749.7) ng/mL and transferin saturation 100 (50-100) %. After sex and age matching, the six minute walk distance was lower in cases than controls (465.1±74.2 vs 671±94.2, p<0.001). Conventional echocardiography did not find any systolic and diastolic dysfunction in cases. However, tissue Doppler echocardiography found 18 (45%) subjects with E/E' ratio >8, which were categorized as diastolic dysfunction. There were no factors correlated to six minute walk distance in cases, while body height was correlated to six minute walk distance in controls based on bivariat analysis.
Conclusion: The distance of six minute walk test in thalassemia subjects was shorter than controls. Tissue Dopper echocardiography is better than conventional in order to evaluating cardiac function. The six minute walk test can be used for screening cardiac function in thalassemia.;Background: Heart failure is leading cause of mortality in thalassemia due to transfusion-induced iron overload. Evaluation of cardiac function is routinely performed with echocardiography. However, its interpretation depends on operator. The six minute walk test is a simple and reliable method to assess cardiorespiratory performance, therefore, it is suggested to be an alternative in evaluating cardiac function in thalassemia.
Aim: To obtain six minute walk test as a simple method in order to evaluating cardiac function in thalassemia.
Methods: This case control study was performed in thalassemia subjects (cases) and controls aged 11-18 year old which were selected with consecutive sampling. Cases should have mean serum ferritin level >2500 ng/mL in last 6 months. Controls must be in healthy condition and have never had blood transfusion. Both cases and controls performed six minute walk test, while echocardiography (conventional and tissue Doppler) was only done in cases by a pediatric cardiologist. Other secondary data collected from medical records in cases were mean of pre-transfusion hemoglobin in last 1 year, serum ferritin and transferin saturation in last 6 months.
Results: There were 40 cases and 109 controls involved in this study with median age were 13.4 (11-17.9) and 14.2 (11.3-17.9), respectively. The mean of pre-transfusion hemoglobin was 7,6±0,6 g/dL. The median serum ferritin was 4246.5 (2506-10749.7) ng/mL and transferin saturation 100 (50-100) %. After sex and age matching, the six minute walk distance was lower in cases than controls (465.1±74.2 vs 671±94.2, p<0.001). Conventional echocardiography did not find any systolic and diastolic dysfunction in cases. However, tissue Doppler echocardiography found 18 (45%) subjects with E/E' ratio >8, which were categorized as diastolic dysfunction. There were no factors correlated to six minute walk distance in cases, while body height was correlated to six minute walk distance in controls based on bivariat analysis.
Conclusion: The distance of six minute walk test in thalassemia subjects was shorter than controls. Tissue Dopper echocardiography is better than conventional in order to evaluating cardiac function. The six minute walk test can be used for screening cardiac function in thalassemia., Background: Heart failure is leading

cause of mortality in thalassemia due to transfusion-induced iron overload. Evaluation of cardiac function is routinely performed with echocardiography. However, its interpretation depends on operator. The six minute walk test is a simple and reliable method to assess cardiorespiratory performance, therefore, it is suggested to be an alternative in evaluating cardiac function in thalassemia.
Aim: To obtain six minute walk test as a simple method in order to evaluating cardiac function in thalassemia.
Methods: This case control study was performed in thalassemia subjects (cases) and controls aged 11-18 year old which were selected with consecutive sampling. Cases should have mean serum ferritin level >2500 ng/mL in last 6 months. Controls must be in healthy condition and have never had blood transfusion. Both cases and controls performed six minute walk test, while echocardiography (conventional and tissue Doppler) was only done in cases by a pediatric cardiologist. Other secondary data collected from medical records in cases were mean of pre-transfusion hemoglobin in last 1 year, serum ferritin and transferin saturation in last 6 months.
Results: There were 40 cases and 109 controls involved in this study with median age were 13.4 (11-17.9) and 14.2 (11.3-17.9), respectively. The mean of pre-transfusion hemoglobin was 7,6±0,6 g/dL. The median serum ferritin was 4246.5 (2506-10749.7) ng/mL and transferin saturation 100 (50-100) %. After sex and age matching, the six minute walk distance was lower in cases than controls (465.1±74.2 vs 671±94.2, $p<0.001$). Conventional echocardiography did not find any systolic and diastolic dysfunction in cases. However, tissue Doppler echocardiography found 18 (45%) subjects with E/E' ratio >8, which were categorized as diastolic dysfunction. There were no factors correlated to six minute walk distance in cases, while body height was correlated to six minute walk distance in controls based on bivariat analysis.
Conclusion: The distance of six minute walk test in thalassemia subjects was shorter than controls. Tissue Dopper echocardiography is better than conventional in order to evaluating cardiac function. The six minute walk test can be used for screening cardiac function in thalassemia.]