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Handgrip Strength pada pasien talasemia mayor anak: Hubungannya dengan asupan nutrisi, lingkar lengan atas serta massa otot = Handgrip Strength in pediatric thalassemia major patients: Its relationship with nutritional intake, Mid-upper arm circumference and muscle mass

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Abstrak

Latar belakang: Pasien Talasemia Mayor (TM) anak menderita defisiensi nutrisi karena asupan nutrisi yang tidak mencukupi. Penghindaran makanan kaya zat besi seringkali bersamaan dengan pembatasan asupan protein. Asupan mikronutrien termasuk magnesium lebih rendah dibandingkan anak normal. Fungsi otot lebih awal terganggu akibat defisiensi nutrisi daripada massa otot. Penilaian massa otot dan Hand Grip Strength (HGS) menjadi penting untuk mengevaluasi status gizi. Hingga saat ini belum ada penelitian di Indonesia yang mengevaluasi hubungan antara HGS dengan asupan kalori, protein dan magnesium, LILA dan massa otot pasien anak TM.
Metode: Penelitian dengan desain studi potong lintang melibatkan 70 pasien TM anak, berusia 6-18 tahun di Pusat Talasemia RSUPN Cipto Mangunkusumo. Status gizi dievaluasi disertai pengukuran lingkar lengan atas (LILA). Asupan kalori, protein dan magnesium diperoleh melalui metode analisis diet semi-kuantitatif Food Frequency Questionnaires (FFQ) dan Magnesium FFQ (MgFFQ). Kadar Mg serum dinilai dengan menggunakan metode enzimatik-kalorimetri. Massa otot diukur menggunakan Bioelectrical Impedance Analysis (BIA) dan HGS dinilai menggunakan Dinamometer tangan Jamar
Hasil: Status gizi berdasarkan LILA/U sebagian besar berstatus gizi baik 42,9% dan malnutrisi 57,1% yakni gizi kurang (30,0%), gizi buruk (25,7%), dan obesitas (1,4%). Rerata kecukupan energi pada anak TM lelaki 100% (SB 17), sedangkan anak perempuan sebesar 112% (SB 27). Rerata asupan protein dan magnesium pada kedua kelompok lebih tinggi dibanding kebutuhan AKG. HGS berkorelasi kuat dengan massa otot (r=0,82), berkorelasi sedang dengan LILA (r=0,60), dan berkorelasi lemah dengan asupan kalori (r=-0,27), protein (r=-0,33) dan magnesium (r=-0,23), serta kadar magnesium (r=0,26). Hipermagnesemia dijumpai pada 23% subyek penelitian. Simpulan: Lebih dari separuh anak Talasemia mengalami malnutrisi walaupun asupan cukup. HGS berkorelasi dengan asupan nutrisi, LILA, dan massa otot.
.....Background: Pediatric Thalassemia Major (TM) patients suffer from nutritional deficiencies due to insufficient nutritional intake. Avoidance of iron-rich foods often coincides with limiting protein intake. Micronutrient intake including magnesium is lower than in normal children. Muscle function is impaired earlier due to nutritional deficiencies than muscle mass. Assessment of muscle mass and Hand Grip Strength (HGS) is important for evaluating nutritional status. Until now there has been no research in Indonesia that evaluates the relationship between HGS and calorie, protein, and magnesium intake, LILA, and muscle mass in pediatric TM patients.
Methods: This research with a cross-sectional study design involved 70 pediatric TM patients, aged 6-18 years at the Thalassemia Center of RSUPN Cipto Mangunkusumo. Nutritional status is evaluated by measurement of mid-upper arm circumference (MUAC). Calorie, protein, and magnesium intake was obtained through semi- quantitative dietary analysis methods Food Frequency Questionnaires (FFQ) and Magnesium FFQ (MgFFQ). Serum Mg levels were assessed using the enzymatic calorimetric method.

Muscle mass was measured using Bioelectrical Impedance Analysis (BIA) and HGS was assessed using a Jamar hand dynamometer.
Results: Nutritional status based on LILA/U was mostly good nutritional status 42.9% and malnutrition 57.1%, namely undernutrition (30.0%), poor nutrition (25.7%), and obesity (1.4%). The average energy adequacy for TM boys is 100% (SD 17), while for girls it is 112% (SD 27). The average intake of protein and magnesium in both groups was higher than the RDA requirements. HGS is strongly correlated with muscle mass (r=0.82), moderately correlated with LILA (r=0.60), and weakly correlated with calorie intake (r=-0.27), protein (r=-0.33), and magnesium (r=-0.23), as well as magnesium levels (r=0.26). Hypermagnesemia was found in 23% of study subjects.
Conclusion: More than half of Thalassemia children experience malnutrition despite adequate intake. HGS correlates with nutritional intake, MUAC, and muscle mass.