Peran profil asam amino bebas plasma, kadar insulin like growth factor 1 (IGFi-1) dan polimorfisme (IGF-1) pada anak stunted = The role of plasma free amino acid profile, insulin like growth factor-1 (IGF-1) level, and (IGF-1) polymorphism in stunted children

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Abstrak

ABSTRAK
Stunting merupakan kondisi malnutrisi pada anak yaitu tinggi badan menurut usia lebih dari minus 2 simpang baku. Indonesia menempati urutan kelima di dunia. Stunting berkorelasi dengan asupan makanan terutama protein, IGF-1 dan protein pengikat Insulin like Growth Factor Binding Protein IGFBP-3 , dan Zinc Zn . Kualitas protein dinilai dari profil asam amino bebas plasma Plasma Free Amino Acid = PFAA dan kuantitas dinilai dari jumlah asupan protein harian. Beberapa penelitian menemukan kadar IGF-1 dipengaruhi oleh polimorfisme SNP rs5742612, rs35767 dan rs35766. Penelitian ini bertujuan untuk menganalisis peran profil PFAA, IGF-1, IGFBP-3, polimorfisme IGF-1, Insulin, dan Zn pada anak.Penelitian ini merupakan studi comparative cross sectional dilakukan di RS Cipto Mangunkusumo, Lembaga Biomolekular Eijkman, dan Labkesda DKI Jakarta. Subjek penelitian adalah anak usia 1 ndash;3 tahun berasal dari UPTD Puskesmas Jatinegara dibagi menjadi 2 kelompok yaitu 101 anak stunted dan 101 anak nonstunted.Pada penelitian ini didapatkan kadar 8 dari 9 AA esensial, 2 AA esensial kondisional, dan 2 AA nonesensial lebih rendah bermakna kelompok stunted dibandingkan nonstunted. Profil PFAA yaitu jumlah anak di bawah nilai rujukan berbeda bermakna antara kelompok stunted dan nonstunted. Terdapat korelasi 8 AA esensial, 1 AA esensial kondisional, dan 2 AA nonesensial dengan tinggi badan anak. Pada kelompok anak stunted, IGF-1, IGFBP-3, insulin, Zn, energi total dan protein lebih rendah bermakna dari kelompok anak nonstunted. Terdapat korelasi bermakna AA esensial dengan IGF-1 dan IGFBP-3. Polimorfisme rs35766 genotipe AG kodominan memiliki pengaruh terhadap kadar IGF-1 pada kelompok nonstunted. Faktor yang memengaruhi kejadian stunting adalah energi atau protein, IGF-1 yang berinteraksi dengan genotipe kodominan AG, IGFBP-3, dan Zn.Simpulan: PFAA, IGF-1 yang berinteraksi dengan SNP rs35766 genotipe kodominan AG, memiliki pengaruh terhadap kejadian stunting. Perlu penelitian lebih lanjut mengenai pemberian pola makan yang tepat untuk mencegah dan mengatasi anak stunted. Kata kunci: AA esensial, AA nonesensial, IGFBP-3, insulin, PFAA, stunting, Zn
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ABSTRACT
Stunting is a malnourished condition in children defined by height for age is under minus 2 standard deviation. Indonesia ranked fifth in world for this condition. Stunting mainly corelates with low protein intakes, IGF-1 and its binding protein Insulin-like Growth Factor Binding Protein/IGFBP-3 , and zinc Zn . Plasma free amino acid profile PFAA measures quality of protein intake, whilst its quantity measured by daily protein intake records. Previous studies found IGF-1 level affected by single nucleotide polymorphism SNP on rs5742612, rs35767 and rs35766. This study aims to analyze the role of PFAA, IGF-1, IGFBP-3, and IGF-1 polymorphism, insulin, and Zn in children.This study is a comparative cross-sectional study held in Cipto Mangunkusumo National General Hospital, Eijkman Institute for Molecular Biology, and Jakarta

Provincial Public Health Laboratory. Subjects were children age 1 ndash;3 years old from Jatinegara Region Public Health Centre divided into two groups of 101 stunted children and 101 non-stunted children.Eight essential AA levels, 2 conditional essential AAs, 2 nonessential AAs were significantly lower in stunted groups than non-stunted. There was significant difference of profile PFAA below normal range between stunted and non-stunted group. Eight essential amino acids, 1 conditional essential amino acid, and 2 non-essential amino acid correlate with children rsquo;s height. IGF-1, IGFBP-3, insulin, Zn, total energy, and protein were significantly lower in stunted children compare to non-stunted children. Significant correlations found for all essential amino acids with IGF-1 and IGFBP-3. The rs35766 AG codominant polymorphism affects IGF-1 level in non-stunted group. Factors affects stunting condition were total energy or protein intake, IGF-1 that interacts with AG codominant genotype, IGFBP-3, and Zn.Conclusion: PFAA and IGF-1 that interacts with SNP rs35766 AG codominant genotype affect stunting. Further study needed to determine appropriate dietary habit for stunting prevention and treatsment. Keywords: Essential amino acid, IGFBP-3, insulin, non-essential amino acid, plasma free amino acid profile, stunting, zinc