# Profil asam amino pada pasien penyakit ginjal kronik: Kajian pada pasien dengan hemodialisis rutin = Amino acid profile in chronic kidney disease patients: Study on patients with routine hemodialysis

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Abstrak

Protein energy wasting (PEW) merupakan sindrom gangguan nutrisi yang sering terjadi pada pasien penyakit ginjal kronik (PGK) dengan hemodialisis rutin sekitar 28-80%. Proses hemodialisis dapat meyebabkan hilangnya nutrien seperti asama amino, meningkatkan proses inflamasi yang kemudian dapat meningkatkan katabolisme protein, dan dapat menghambat utilisasi asam amino dalam sintesis protein. Jika tidak ditangani, PEW dapat meningkatkan morbiditas dan mortalitas pasien PGK. Tujuan utama penelitian adalah untuk mengetahui profil asam amino pasien PGK dengan hemodialisis rutin. Desain penelitian adalah potong lintang dengan 60 subjek pasien PGK usia >18 tahun dengan hemodialisis rutin di RS. Umum Pusat Nasional Dr. Cipto Mangukusumo. Sampel berupa dried blood spot (DBS) dan pemeriksaan asam amino menggunakan metode Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS). Asam amino yang diperiksa adalah asam amino nonesensial (alanin, arginin, asam aspartat, asam glutamat, asparagin, glisin, glutamin, prolin, serin, tirosin), esensial (histidin, fenilalanin, isoleusin, leusin, lisin, metionin, treonin, triptofan, valin), dan khusus (ornitin, sitrulin). Hasil penelitian didapatkan hampir semua kadar asam amino pada subjek lebih rendah terutama alanin, tirosin, histidin, dan valin; sebaliknya asam aspartat dan serin ditemukan lebih tinggi kadarnya dibandingkan nilai rujukan Mayo dan data internal dewasa sehat. Didapatkan adanya hubungan bermakna antara jenis kelamin dengan fenilalanin, isoleusin, leusin; hipoalbuminemia (albumin <4 g/dL) dengan glisin; hipoalbuminemia (<3,5 g/dL) dengan arginin, asam aspartat, asparagin, histidin, lisin, metionin, dan ornitin. Didapatkan korelasi yang bermakna antara usia dengan BCAA (isoleusin, leusin, valin), dan metionin; dan hemoglobin dengan isoleusin. Penelitian ini merupakan penilitian pertama tentang profil asam amino pada pasien PGK dengan hemodialisis di Indonesia dan penelitian pertama kali yang menggunakan sampel DBS pada orang dewasa. Dengan diketahuinya profil asam amino pada PGK dapat dimanfaatkan sebagai dasar pemberian jenis suplementasi asam amino yang sesuai dengan populasi pasien PGK dengan hemodialisis di Indonesia.

.....Protein energy wasting (PEW) is a nutritional disorder syndrome that often occurs in patients with chronic kidney disease (CKD) on routine hemodialysis around 28-80%. The process of hemodialysis can cause the loss of nutrients such as amino acids, increase the inflammatory process which can increase protein catabolism, and be able to inhibit the utilization of amino acids in protein synthesis. If untreated, PEW can increase the morbidity and mortality of CKD patients. The main objective of the study was to determine the amino acid profile of CKD patients on routine hemodialysis. The study

design was cross sectional with 60 subjects of CKD patients aged >18 years on routine hemodialysis at Dr. Cipto Mangunkusumo National Public Hospital. Samples in the form of dried blood spot (DBS) and amino acid examination using the Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS) method. Amino acids examined were nonessential amino acids (alanine, arginine, aspartic acid, glutamic acid, asparagine, glycine, glutamine, proline, serine, tyrosine), essential (histidine, phenylalanine, isoleucine, leucine, lysine, methionine, glycine, glutamine, proline, serine, tyrosine), special (ornithine, citrulline). The results showed that almost all amino acid levels in the subjects were lower especially alanine, tyrosine, histidine, and valine; in contrast, aspartic acid and serine were found to be higher than Mayo reference value and internal data of healthy adults. A significant relationship was found between gender and phenylalanine, isoleucine, leucine; hypoalbuminemia (albumin <4g/dL) with glycine; hypoalbuminemia (<3.5 g/dL) with arginine, aspartate acid, asparagine, histidine, lysine, methionine, and ornithine. Significant correlation was obtained between age with BCAA (isoleucine, leucine, valine), and methionine; and hemoglobin with isoleucine. This study is the first study of the amino acid profile in CKD patients with hemodialysis in Indonesia and the first study using DBS samples in adults. Knowing the amino acid profile in CKD can be used as a basis for the of amino acid supplementation that is suitable for the population of CKD patients with hemodialysis in Indonesia.