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Impact of Energy and Protein Intake on Hand Grip Strength, and Nutritional Status in Maintenance Hemodialysis Patients

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Objectives: Protein-energy malnutrition (PEM) in maintenance hemodialysis (MHD) patients is one of several problems as a consequence of dialysis process. Dialysis process induces in lose of nutrients and decreased protein synthesis during the treatment. In addition, MHD patients also have several symptoms of uremia, such as anorexia, nausea, vomiting that cause nutrient needs is difficult to meet. In a prolonged term, PEM will lead on morbidity and mortality. Thus, the aim of the study was to investigate impact of energy and protein intake on nutritional status and handgrip strength (HGS).

Methods: This was a cross-sectional study conducted in January 2019. As 66 MHD patients in Hemodialysis Unit, Universitas Gadjah Mada Hospital were participated. Dietary intake data was performed by brief food frequency questionnaire (BFFQ). We measured nutritional status based on body mass index (BMI), mid upper arm circumference (MUAC) and body muscle. We assessed handgrip strength (HGS) using hand dynamometer. Data was analysed using Pearson's rank test.

Results: Mean value of energy intake was 29.33±10.20 kcal/kg ideal body weight (IBW) and protein intake is 0.74±0.34S grams/kgIBW. The mean of BMI were 22.16±4.36 kg/m^2. There was significant positive correlation between energy intake with HGS (*r=0.276, p=0.025)* and protein intake with HGS (*r=0.276, p=0.05*). No correlation between energy and protein intake with BMI, MUAC and body muscle.

Conclusions: Energy and protein intake are positively correlated with HGS. Patient who has higher energy and protein intake will have stronger HGS value. It should be suggested to MHD patient for implementing high energy and protein diet to prevent PEM and loss of muscle mass that may causes in increasing risk of mortality.

Tabel 1. Mean Value of Energy Intake, Protein Intake, and Nutrition Status

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	Mean	SD
Energy Intake (kcal/kg ideal body weight)	29.33	10.20
Protein Intake (kcal/kg ideal body weight)	0.74	0.34
Nutrition Status		
HGS (kg)	19.37	10.05
Muscle Mass (%)	31.20	6.73
BMI (kg/m²)	22.16	4.36
MUAC (cm)	24.76	4.06

Tabel 2. The Correlation between Energy Intake, Protein Intake and HGS, Nutritional Status

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Nutrition Status	Energi Intake		Protein Intake	
	r	P	r	P
HGS	0.276	0.025	0.343	0.005
Nutritional Status				
BMI	-0.060	0.633	0.026	0.837
MUAC	0.234	0.058	0.177	0.156
Body Muscle	0.132	0.290	0.130	0.297