

Hubungan antara asupan nutrisi dan aktivitas dengan resorpsi tulang pada lanjut usia = The relationship between nutritional intake and physical activity with bone resorption of Indonesian elderly

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Abstrak

Tujuan

Mengetahui hubungan antara asupan energi, protein, kalsium, vitamin D dan aktivitas fisik dengan resorpsi tulang

Tempat

Malang, Jawa Timur

Metodologi

Studi potong lintang terhadap 109 lansia sehat. Data yang dikumpulkan meliputi karakteristik subyek penelitian berdasarkan umur, jenis kelamin, data antropometri (berat badan, tinggi badan, indeks massa tubuh), analisis asupan zat gizi dengan FFQ semikuantitatif dan recall 1 x 24 jam, analisis aktivitas fisik dengan kuesioner aktivitas fisik, dan data laboratorium (CTx serum dan rasio kalsium kreatinin dalam urin 24 jam). Data dianalisis dengan uji korelasi Pearson dan analisis multivariat regresi multiple.

Hasil

Subyek penelitian terdiri dari 49 laki-laki dan 60 perempuan dengan rerata usia $68,19 \pm 5,91$ tahun. Sebagian besar subyek penelitian berpendidikan sedang sampai tinggi, dan berpenghasilan menengah rendah. Rerata IME subyek penelitian ialah $23,86 \pm 3,08$ kg/m². Rerata asupan energi ialah $1548 \pm 416,23$ kkal; rerata asupan protein $59,14 \pm 11,37$ g; rerata asupan kalsium $928,62 \pm 360,79$ mg, dan rerata asupan vitamin D $9,85 \pm 5,09$ pg. Indeks aktivitas fisik sebagian besar subyek penelitian menengah sampai tinggi. Didapatkan korelasi negatif yang bermakna antara CTx dengan asupan energi, protein, kalsium, dan aktivitas fisik. Korelasi negatif bermakna juga didapatkan antara rasio kalsium kreatinin dengan asupan energi, protein dan kalsium, sedangkan korelasi positif bermakna didapatkan dengan variabel umur. Pada analisis multivariat, CTx berhubungan secara negatif bermakna dengan protein, kalsium dan aktivitas fisik. Sedangkan rasio kalsium kreatinin berhubungan secara positif bermakna dengan umur dan kalsium.

Kesimpulan

Rerata asupan energi subyek penelitian lebih rendah daripada AKG VIII, namun dengan tingkat asupan tersebut, IMT dalam batasan normal sampai obes. Rerata asupan protein, kalsium dan vitamin D subyek penelitian lebih besar dibandingkan dengan AKG VIII. Didapatkan hubungan yang bermakna antara asupan protein, kalsium dan aktivitas fisik dengan resorpsi tulang. Didapatkannya hubungan yang bermakna, namun dengan derajat rendah, menunjukkan adanya pengaruh faktor lain dalam bahan makanan.

Objective

To determine the relationship between nutritional intake and physical activity with bone resorption of

Indonesian elderly

Place

Malang, East Java

Method

A cross-sectional study in 109 community dwelling elderly (>60 y) free of medication known to affect bone. Semiquantitative FFQ, validated with 1x24 hour food recall was used to assess energy, protein, calcium, and vitamin D. Assessment of physical activity was done with a questionnaire based on the Dutch questionnaire modified by Josten. Bone resorption was measured by its collagen degradation product, C-telopeptide in serum. Bivariate and multivariate analysis was done to assess relationship between nutrients and physical activity with biomarker of bone resorption.

Results

Subjects were 49 men and 60 women with mean age of 68,19 $\pm$ 5,91 years old. Most subjects had moderate high education, and a middle low income. Based on the Physical Activity Index, most subjects had moderate to high physical activity. The body mass index of most subjects was normal to obese. Mean intake of energy in subjects was 1548 $\pm$ 416,23 kcal. Mean intake of protein was 59,14 $\pm$ 11,37 g/d, mean Calcium intake was 928,62 mg/d and mean vitamin D intake was 9,85 $\pm$ 5,09 μ g. There were significant negative correlations between intakes of energy, protein, calcium, and physical activity with CTx. Significant negative correlations were also found between intakes of energy, protein, calcium with calcium creatinine ratio, while positive significant correlations were found with age. Multiple regression analysis showed significant relationships between protein and calcium intakes and physical activity with CTx and between calcium intake and age with calcium creatinine ratio.

Conclusion

Mean intake of energy was lower than the Indonesian RDA. But at this level BMI was normal to obese. Mean intakes of protein, calcium and vitamin D were well above the Indonesian RDA. Significant relationships were found between intakes of protein and calcium and physical activity with bone resorption. The rather low but statistically significant relationship, shows that the other factors in food sources, that may play a role in bone resorption, such as osteoprotegerin/OPG, IGF-1, potassium, vitamin K, zinc and magnesium.