

# Hubungan status tiroid dengan kadar alkali fosfatase serum, osteokalsin serum dan serum collagen degradation C-telopeptide type-1 pada wanita dengan penyakit graves usia reproduktif = Correlation between thyroid status and serum alkaline phosphatase osteocalcin and collagen degradation c telopeptide type 1 levels among reproductive age women with graves disease / Susie Setyowati

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## Abstrak

### <b>ABSTRAK</b><br>

Latar Belakang: Penyakit Graves merupakan penyebab terbanyak hipertiroidisme. Remodeling pada hipertiroidisme dilaporkan meningkat terutama resorpsi tulang. Peningkatan turnover tulang terus menerus bertanggung jawab terhadap percepatan keropos tulang. Tujuan penelitian ini adalah untuk melihat korelasi antara status tiroid dengan kadar ALP, OC sebagai penanda formasi tulang dan CTx sebagai penanda resorpsi tulang.

Metode: Metode yang digunakan adalah potong lintang dengan consecutive sampling pada wanita penyakit Graves usia reproduktif di Poliklinik Metabolik Endokrin RSCM pada periode Juli–September 2014.

Analisis statistik dilakukan dengan Mann Whitney, korelasi Spearman dan analisis ROC.

Hasil: Pada 68 subyek penelitian, didapatkan 28 (41.2%) eutiroid, 23 (33.8%) hipertiroid subklinis dan 17 (25%) hipertiroid. Terdapat perbedaan median kadar penanda remodeling tulang antara kelompok eutiroid dan kelompok belum eutiroid (hipertiroid subklinis/hipertiroid) yaitu ALP (71 U/L [40-165] vs 91.5 U/L [39-256]), OC (19.48 ng/mL [10.95-92.70] vs 32.46 ng/mL [13.31-137.0]), dan CTx (0.36 ng/mL [0.11-1.24] vs 0.613 [0.11-1.93]).

Pada uji Spearman didapatkan tidak ada korelasi yang bermakna antara FT4 dengan ALP ( $r=0.106$   $p=0.389$ ); terdapat korelasi positif yang bermakna FT4 dengan OC dan CTx ( $r=0.289$   $p=0.017$  dan  $r=0.265$   $p=0.029$ ); terdapat korelasi negatif yang bermakna antara TSH dengan ketiga penanda tulang yaitu ALP ( $r=-0.240$   $p=0.049$ ), OC ( $r=-0.450$   $p<0.001$ ) dan CTx ( $r=-0.420$   $p<0.001$ ). Sensitivitas dan spesifisitas diskriminasi TSH dengan kadar serum CTx adalah baik dengan nilai 70.72% dan 70.96% dan titik potong TSH yang didapatkan adalah 0.015 IU/mL.

Simpulan: Median ALP, OC dan CTx pada kelompok belum eutiroid lebih tinggi daripada kelompok eutiroid. Terdapat korelasi positif yang bermakna antara FT4 dengan OC dan CTx. Terdapat korelasi negatif yang bermakna antara TSH dengan ALP, OC dan CTx. Titik potong TSH 0.015IU/mL merupakan penanda yang sensitif dan spesifik untuk kadar serum CTx.

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### <b>ABSTRACT</b><br>

Background: Grave's disease (GD) is one of the main causes of hyperthyroidism. Bone remodelling has been reported to increase in hyperthyroidism, especially bone resorption. Continuous increase in bone remodelling has been held responsible for accelerated bone loss. The aim of this study is to find correlation between thyroid status and serum ALP and OC levels as bone formation marker as well as serum CTx as bone resorption marker.

**Methods:** This is a cross-sectional study involving reproductive-age women with GD who attended endocrine metabolic outpatient clinic Cipto Mangunkusumo General Hospital from July to September 2014. Sampling was conducted by mean of consecutive sampling. Statistical analysis was performed using Mann-Whitney, Spearman correlation and ROC analysis.

**Results:** From 68 subjects, 28 (41.2%) were euthyroidism, 23 (33.8%) were subclinical hyperthyroidism and 17 (25%) were hyperthyroidism. We found the difference in median concentration of bone markers between euthyroidism group and non euthyroidism group (subclinical hyperthyroidism/hyperthyroidism) i.e. ALP (71 U/L [40-165] vs 91.5 U/L [39-256]), OC (19.48 ng/mL [10.95-92.70] vs 32.46 ng/mL [13.31-137.0]), and CTx (0.36 ng/mL [0.11-1.24] vs 0.613 [0.11- 1.93]). Spearman test used to find correlation between FT4 and bone markers showed no significant correlation between FT4 and ALP ( $r=0.106$ ,  $p=0.389$ ).

Nevertheless, FT4 was significantly correlated with OC and CTx in a positive manner ( $r=0.017$  and  $r=0.265$ ,  $p=0.029$ ). Correlation between TSH and bone markers was found to be significantly negative (ALP [ $r=-0.240$ ,  $p=0.049$ ], OC [ $r=-0.450$ ,  $p<0.001$ ] and CTx [ $r=-0.420$ ,  $p<0.001$ ]). Sensitivity and specificity of TSH discrimination with serum concentration of CTx was 70.72% and 70.96% respectively with obtained cut off for TSH was 0.015 IU/mL.

**Conclusion:** Median value of the three bone markers are higher in non euthyroidism group compared to that of euthyroid group. The correlation between FT4 and OC or CTx is positive and significant. Cut-off point of 0.015 IU/mL for TSH is a sensitive and specific marker for serum concentration of CTx.