

Kadar pentosidine serum dan endogenous secretory receptor of advanced glycation end products pada perempuan pramenopause diabetes melitus tipe 2 sebagai faktor penentu kualitas tulang: dampak pada procollagen 1 intact n-terminal propeptides = Level of serum pentosidine and endogenous secretory of advanced glycation end products in premenopausal women with type 2 diabetes mellitus as a predictor of bone quality: impact on procollagen 1 intact n-terminal propeptides

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Abstrak

ABSTRAK

Latar Belakang: Pasien Diabetes Mellitus DM tipe 2 memiliki peningkatan risiko terjadinya fraktur yang dikenal dengan istilah diabetoporusis. Pemeriksaan Bone Mass Densitometry BMD dinilai tidak superior dalam mendiagnosis diabetoporusis mengingat nilai BMD pada DM tipe 2 dapat normal bahkan meningkat. Beberapa penanda diharapkan dapat menggambarkan kualitas tulang secara non invasif. Peran AGEs dan reseptornya dinilai penting dalam proses diabetoporusis. Namun demikian, penelitian mengenai penanda AGEs dan reseptornya pada pasien DM tipe 2 masih tergolong sangat sedikit serta belum adanya penelitian yang membandingkan kadar AGEs dan reseptornya pada pasien DM tipe 2 dan subjek normal. Tujuan: Penelitian ini bertujuan untuk mengetahui perbedaan kadar pentosidine serum, esRAGE serum, rasio esRAGE/pentosidine serum antara pasien DM tipe 2 dan subjek normal, serta korelasi rasio esRAGE/pentosidine serum terhadap P1NP serum sebagai penanda peningkatan risiko diabetoporusis. Metode: Penelitian ini merupakan studi potong lintang terhadap 38 perempuan DM tipe 2 belum menopause, berusia 35 tahun dengan diagnosis DM tipe 2 yang berobat di Poli Metabolik Endokrin RSCM, Klaster Diabetes Kencana RSCM, RSUP Persahabatan, RSUK Tugu Koja, RSUK Kemayoran, dan Puskesmas Jatinegara. Sebagai kelompok non DM adalah 36 perempuan non DM dengan rentang usia yang sama. Pengambilan sampel dilakukan secara simple random sampling terhadap darah yang terkumpul. Pemeriksaan Pentosidine serum dan esRAGE dilakukan dengan metode ELISA sedangkan pemeriksaan P1NP dilakukan dengan menggunakan metode ECLIA. Hasil Penelitian: Pasien DM tipe 2 memiliki kadar pentosidine lebih tinggi $p=0,028$, kadar esRAGE yang lebih rendah $p=0,248$, serta rasio esRAGE/pentosidine yang lebih rendah $p=0,001$ daripada subjek normal. Rerata kadar pentosidine serum pada DM tipe 2 dan subjek normal adalah 5406 1911 pmol/ml dan 3145 1892 pmol/ml; sedangkan median rasio esRAGE/pentosidine serum adalah 0,03 pg/pmol dan 0,06 pg/pmol. Tidak terdapat korelasi antara rasio esRAGE/pentosidine dengan kadar P1NP serum. Kesimpulan: Kondisi hiperglikemia pada DM tipe 2 menyebabkan tingginya kadar pentosidine serum yang tidak diimbangi dengan peningkatan kadar esRAGE serum. Secara khusus, terjadi penurunan rasio esRAGE/pentosidine serum pada pasien DM tipe 2 perempuan dan tidak ditemukan korelasi antara rasio esRAGE/pentosidine serum dengan kadar P1NP serum sebagai penanda formasi tulang.

ABSTRACT

Background: Diabetes Mellitus type 2 T2DM patients have an increased risk of fracture known as diabetoporusis. Examination of Bone Mass Densitometry BMD is considered not superior in diagnosing diabetoporusis since the BMD value in type 2 DM can be normal and even increased. Some markers are expected to describe bone quality in a non

invasive manner. The role of AGEs and their receptors is considered important in the process of diabetoporosis. However, research on the role of AGEs and their receptors in T2DM patients is still lacking and there was no study comparing AGEs and their receptors in T2DM and non T2DM patients before. Aim: The aim of this study is to determine the difference of serum pentosidine level, serum esRAGE, serum esRAGE/pentosidine ratio between T2DM and non T2DM patients, and correlation of serum esRAGE/pentosidine ratio to serum P1NP as a marker of increased risk of diabetoporosis. Method: This is a cross-sectional study on 38 premenopausal females with T2DM with a minimum age of 35 years with symptoms or diagnosis of T2DM for more than 5 years, seen for treatment at Endokrin Metabolik Klinik at RSCM, Klaster Diabetes RSCM Kencana, RSUP Persahabatan, RSUK Tugu Koja, RSUK Kemayoran, and Puskesmas Jatinegara. Healthy controls are 36 non-DM females with similar age range. Sampling was done by simple random sampling. Serum pentosidine and serum esRAGE measurement were done by ELISA method and serum P1NP measurement was done by ECLIA method. Results: T2DM patients had higher serum pentosidine levels $p=0.028$, lower serum esRAGE $p=0.248$, as well as lower esRAGE/pentosidine $p=0.001$ ratios than non T2DM. Serum pentosidine in T2DM and non T2DM is 5406 1911 pmol/ml and 3145 1892 pmol/ml; whereas median ratio of serum esRAGE/pentosidine was 0.03 pg/pmol and 0.06 pg/pmol. There was no correlation between ratio serum esRAGE/pentosidine and serum P1NP in T2DM patients. Conclusions: Hyperglycemia in T2DM patients lead to high serum pentosidine levels that are not followed by elevated serum esRAGE levels. In combination, there was a decrease level of serum esRAGE/pentosidine ratio in T2DM patients. No correlation was seen between level of serum esRAGE/pentosidine ratio and level of P1NP as a marker for bone formation in T2DM patients.