

PENGARUH MEDIA TERKONDISI SEL PUNCA MESENSIMAL TERHADAP EKSPRESI GEN *RETINOL BINDING PROTEIN 4* (RBP-4) TIKUS MODEL DIABETES MELITUS TIPE 2

Demas Bayu Handika

15/08523/PMU/08523

INTISARI

Diabetes melitus tipe 2 merupakan tipe diabetes yang memiliki prevalensi sebesar 90-95% dari keseluruhan kasus diabetes. Banyak faktor yang mempengaruhi terjadinya DM tipe 2, salah satunya perubahan ekspresi gen RBP-4 yang menyebabkan terjadinya hiperglikemia, resistensi insulin, hingga kerusakan sel β pankreas. Media terkondisi sel punca mesensimal kaya akan *Growth Factor* sehingga berpotensi untuk dijadikan agen terapi. Penelitian ini bertujuan untuk mengetahui pengaruh MT-SPM peningkatan sensitifitas insulin yang digambarkan dengan penurunan HOMA-IR dan penurunan ekspresi gen *RBP-4* pada tikus model DM tipe 2 dengan dan tanpa terapi. Hewan uji yang digunakan adalah tikus *Sprague Dawley* jantan usia 8 minggu dengan berat badan 150-200 gram sebagai objek penelitian. Tikus dibagi menjadi 3 kelompok yaitu K (-): 9 tikus tanpa injeksi STZ dan NA; K (+): 9 tikus DM tipe 2 (injeksi STZ 60 mg/kgBB + NA 120 mg/kgBB ip) tanpa terapi MT-SPM; P: 9 tikus DM tipe 2 + MT-SPM 0,1 cc/200g bb ip. Pemberian MT-SPM dilakukan setiap 3 hari setelah tikus terkena DM tipe 2 sebanyak 10 kali. Pengukuran ekspresi gen RBP-4 dilakukan dengan qRT-PCR yang kemudian akan dianalisis dengan *Independent sample T-Test* pada signifikansi 95%. Hasil penelitian menunjukkan penurunan HOMA-IR pada pemberian MT-SPM dengan nilai $0,32 \pm 0,76$. Ekspresi gen RBP-4 menunjukkan penurunan pada pemberian MT-SPM dengan kelipatan sebesar 1,62 kali. Menurunnya ekspresi RBP-4 mampu memperbaiki kerusakan reseptor insulin sehingga meningkatkan *signaling insulin* pada otot.

Kata kunci: MT-SPM, DM tipe 2, resistensi insulin, hiperglikemik, ekspresi gen RBP-4

THE EFFECT OF MESENCHYMAL STEM CELL- CONDITIONED MEDIUM TO THE EXPRESSION OF RETINOL BINDING PROTEIN 4 (RBP-4) GENE IN TYPE 2 DIABETIC RAT MODELS

Demas Bayu Handika

15/08523/PMU/08523

ABSTRACT

One of the factors influencing DM type 2 is RBP-4 gene expression that causes hyperglycemia, insulin resistance, and the damage of β cells in the pancreas. Mesenchymal Stem Cell-Conditioned Medium (MSC-CM) is rich with *Growth Factor* that potentially can be used as therapeutic agent. This study is aimed at investigating the influence of MT-SPM in increasing insulin sensitivity and decreasing RBP-4 gene expression in DM type 2 rat models with or without therapy. This study used 8 weeks male Sprague Dawley rats at 150-200 grams as object of the research. These rats were divided into three groups: (1) K (-): 9 rats without STZ and NA injection; (2) K (+): 9 DM type 2 rats (injection of STZ 60 mg/kg body weight + NA 120mg/kg body weight ip) without MT-SPM therapy; (3) P: 9 rats of DM type 2 + MT-SPM 0,1 cc/200g body weight ip. MT-SPM was injected 10 times that were done regularly every 3 days after the rats suffered DM type 2. The HOMA-IR scores were calculated based on data on fasting insulin levels and fasting glucose of other research team members. Expression of RBP-4 gene are measured with qRT-PCR. This study used Independent sample T-Test with 95% level of significance as data analysis technique. The result of research revealed that the value of HOMA-IR in treatment group (P) was decreased at average of $0,32 \pm 0,76$ and RBP-4 was at down regulation at fold 1,62. The decrease of RBP-4 expression can repair insulin receptor which lead to increase insulin signaling at muscles.

Key words: MSC-CM, DM Type 2, HOMA-IR, insulin signaling, RBP-4