PENGARUH MEDIA TERKONDISI SEL PUNCA MESENSIMAL TERHADAP EKSPRESI GEN *TRANSCRIPTION FACTOR 7-LIKE 2* (*TCF7L2*) TIKUS MODEL DIABETES MELITUS TIPE 2

Stefani Santi Widhiastuti

15/389583/PMU/08542

INTISARI

Diabetes melitus tipe 2 adalah jenis diabetes yang paling umum. Berbagai macam terapi telah dilakukan namun masih tetap memiliki keterbatasan. Penelitian ini dilakukan untuk mengetahui pengaruh MSC-CM dalam meningkatkan nilai HOMA-β, jumlah sel Langerhans normal, dan ekspresi gen *Trancription Factor 7-Like 2* (TCF7L2) pada model tikus diabetes tipe 2. Gen TCF7L2 mengaktifkan gen proglukagon di sel usus untuk mensekresi GLP-1 yang berperan dalam sekresi insulin. Penelitian ini merupakan laboratorium penelitian eksperimental murni dengan desain *Posttest Control Group*. Sebanyak 27 ekor tikus *Sprague Dawley* dibagi menjadi 3 kelompok penelitian penelitian, kontrol normal (K(-)): 9 tikus sehat; kontrol sakit (K(+)): 9 tikus DM tipe 2 (60mg/kgBB STZ+NA 120mg/kgBB i.p); perlakuan (P): 9 tikus DM tipe 2+MT-SPM 0,1ml/200gBW i.p. Pada hari ke 30 setelah perlakuan, ekspresi gen TCF7L2 diukur dengan RT-qPCR. Analisis data dilakukan dengan *Independent Sample T-test* dengan signifikansi 95%. Nilai HOMA-β dihitung berdasarkan nilai FINs dan KGDP dari anggota tim peneliti lainnya, dari K(-)(27,85%)>P(16,43%)>K(+)(0,61%). Nilai HOMA-β P meningkat secara signifikan dari K(+) (p = 0,17) dan tidak ada perbedaan yang signifikan dengan kelompok normal (p=0,434). Jumlah rata-rata sel pulau Langerhans normal K(+)(12,67), P(17,56), dan K(-)(21,11). Tidak ada perbedaan signifikan antara ketiga kelompok tersebut. Ekspresi gen TCF7L2 K(+) meningkat 2,16 kali dan P meningkat 2,19 kali dibandingkan dengan K(-). Tidak ada perbedaan yang signifikan pada tingkat ekspresi gen TCF7L2 antara K(+) dan P (p = 0,939). Pemberian MT-SPM tidak meningkatkan ekspresi gen TCF7L2, namun dapat meningkatkan nilai HOMA-β dan jumlah sel Langerhans normal pada tikus model tikus diabetes tipe 2.

Kata kunci: diabetes melitus tipe 2, MT-SPM, HOMA-β, TCF7L2

THE EFFECT OF MESENCHYMAL STEM CELL-CONDITIONED MEDIUM ON TRANSCRIPTION FACTOR 7-LIKE 2 (TCF7L2) GENE EXPRESSION IN TYPE 2 DIABETIC RAT MODELS

Stefani Santi Widhiastuti

15/389583/PMU/08542

ABSTRACT

Diabetes mellitus type 2 is the most common type of diabetes. Various kinds of therapy have been performed but still have limitations. This study was conducted to determine the effect of MSC-CM in increasing HOMA-β value, normal Langerhans cell count, and Transcription Factor 7-Like 2 (TCF7L2) gene expression in type 2 diabetic rats model. TCF7L2 gene activates proglucagon gene in intestinal cell to secrete GLP-1 that plays a role in insulin secretion. This research is a purely experimental research laboratory with Posttest Control Group design. As many as 27 male Sprague Dawley rats were divided into 3 study research groups, normal control (K(-)): 9 normal rats; diabetic control (K(+)): 9 type 2 DM rats (60mg/kgBW STZ + NA 120mg/kgBW i.p); treatment (P): 9 type 2 DM rats + MSC-CM 0,1ml/200gBW i.p. On day 30 after therapy, the expression of TCF7L2 gene was performed with real time-quantitative PCR (RT-qPCR). Data analysis was performed by Independent Sample T-test at 95% significance. The HOMA-β value were calculated based on FINs levels and FBG levels data from other research team members, from the highest K(-)(27,85%)>P(16,43%)> K(+)(0,61%). The HOMA-β value of P significantly increased than K(+) (p=0,17) and no significant difference with the normal group (p=0,434). The average number of normal Langerhans islet cells K(+)(12,67), P(17,56), and K(-)(21,11). There was no signifcant difference among the three groups. TCF7L2 gene expression of K(+) increased 2,16 times and P increased 2,19 times compared to K(-). There was no significant difference in TCF7L2 gene expression level between K(+) and P (p = 0,939). Giving MSC-CM did not increase the TCF7L2 gene expression, but it can increase the HOMA-β value and the number of normal Langerhans islet cells on type 2 diabetic animal model rat.

Keywords: diabetes mellitus type 2, MSC-CM, HOMA-β, TCF7L2