

# Pengaruh suplementasi $\beta$ -carotene terhadap kadar glukosa darah dan kadar malondialdehida pada tikus *sprague dawley* yang diinduksi *Streptozotocin*

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## ABSTRACT

**Background :** *Hyperglycemia on diabetes mellitus can cause increasing of free radicals production. Free radicals caused lipid peroxidation reaction by forming malondialdehyde (MDA).  $\beta$ -carotene has antioxidant activity may inhibit the formation of ROS.*

**Objective :** *To prove the effect of multilevel doses  $\beta$ -carotene 1 mg/kg BW, 10 mg/kg BW and 20 mg/kg BW on alternate days within 30 days orally supplementation on blood glucose level and MDA level on Sprague Dawley male rats induced by streptozotocin (STZ).*

**Methods :** *Thirty rats were randomly divided into 5 groups: X<sub>1</sub>=Negative control/diabetic, X<sub>2</sub> (STZ 40 mg/kg BW + BC 1 mg/kg BW), X<sub>3</sub> (STZ 40 mg/kg BW + BC 10mg/kg BW), X<sub>4</sub> (STZ 40 mg/kg BW + BC 20 mg/kg BW), X<sub>5</sub> (technic control/non diabetic).  $\beta$ -Carotene supplementation was given by nasogastric tube on alternate days within thirty days. Blood glucose level was measured by GOD-PAP and MDA level by ELISA with TBARS methods. Data was analyzed using paired t-test, wilcoxon, one way anova and post hoc bonferroni.*

**Results :** *there was a significant difference of blood glucose level ( $p = 0,0001$ ) and MDA level ( $p = 0,0001$ ) after supplementation  $\beta$ -carotene on alternate days within 30 days orally.  $\beta$ -carotene 10 mg/kg BW was the most effective and efficient dose to lowering blood glucose, while 20 mg/kg BW to lowering MDA level.*

**Conclusion :** *The multilevel doses  $\beta$ -carotene (1 mg/kg BW, 10 mg/kg BW and 20 mg/kg BW) on alternate days within 30 days orally supplementation can decrease blood glucose and MDA level.  $\beta$ -carotene 10 mg/kg BW is the most effective and efficient to decrease blood glucose and  $\beta$ -carotene 20 mg/kg BW to decrease MDA level.*

**Keywords :**  *$\beta$ -carotene, blood glucose level, MDA level, diabetes mellitus*

## ABSTRAK

**Latar belakang :** *Hiperglikemia pada diabetes mellitus dapat menyebabkan peningkatan produksi radikal bebas. Radikal bebas menyebabkan terjadinya lipid peroksida dengan membentuk malondialdehida (MDA).  $\beta$ -carotene memiliki aktivitas antioksidan yang dapat menghambat terbentuknya ROS*

**Tujuan :** *Membuktikan pengaruh dosis bertingkat  $\beta$ -carotene 1 mg/kg BB, 10 mg/kg BB dan 20 mg/kg BB melalui sonde 2 hari sekali dalam 30 hari terhadap penurunan kadar glukosa darah dan kadar MDA pada tikus jantan Sprague Dawley yang diinduksi STZ.*

**Metode Penelitian:** *Tiga puluh tikus dibagi acak menjadi 5 kelompok = X<sub>1</sub> (kontrol negatif/diabetik); X<sub>2</sub> (STZ 40 mg/kg BB + BC 1 mg/kg BB); X<sub>3</sub> (STZ 40 mg/kg BB + BC 10mg/kg BB); X<sub>4</sub> (STZ 40 mg/kg BB + BC 20 mg/kg BB); X<sub>5</sub> (kontrol teknik/non diabetik). Pemberian BC diberikan melalui sonde, dua hari sekali dalam 30 hari. Kadar glukosa darah diperiksa menggunakan metode GDO-PAP, kadar MDA menggunakan ELISA dengan metode TBARS. Analisis data diuji dengan menggunakan paired t-test, wilcoxon, one way anova dan post hoc bonferroni.*

**Hasil :** *Ada perbedaan yang bermakna pada kadar glukosa darah ( $p = 0,0001$ ) dan MDA ( $p = 0,0001$ ) setelah diberi perlakuan  $\beta$ -carotene dosis bertingkat 1 mg/kg BB, 10 mg/kg BB dan 20 mg/kg BB melalui sonde 2 hari sekali dalam 30 hari. Pemberian dosis 10 mg/kg BB merupakan dosis yang paling efektif dan efisien untuk menurunkan kadar glukosa darah dan dosis 20 untuk menurunkan kadar MDA.*

**Simpulan :** *Pemberian  $\beta$ -carotene dosis bertingkat 1 mg/kg BB, 10 mg/kg BB dan 20 mg/kg BB melalui sonde 2 hari selama 30 hari dapat menurunkan kadar glukosa darah dan MDA. Pemberian  $\beta$ -carotene 10 mg/kg BB yang paling efektif dan efisien untuk menurunkan kadar glukosa darah dan  $\beta$ -carotene 20 mg/kg BB untuk menurunkan kadar MDA.*

**Kata Kunci :**  *$\beta$ -carotene, glukosa darah, malondialdehida, diabetes mellitus*