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Vitamin D3 Supplementation Modulation of Kidney Inflammation Marker Interluekin-6 in Prediabetic Rat Models = Vitamin D3 Supplementation Modulation of Kidney Inflammation Marker Interluekin-6 in Prediabetic Rat Models

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Abstrak

Latar belakang: Prediabetes adalah penyakit metabolik yang ditandai dengan peningkatan kadar gula darah di bawah kriteria diagnosis diabetes yang memicu inflamasi yang menurunkan fungsi ginjal. Vitamin D3 dapat menurunkan ekspresi faktor inflamasi IL-6 dan meringankan inflamasi ginjal. Dari itu, vitamin D3 memiliki potensial yang belum diselidiki untuk menurunkan inflamasi karena prediabetes pada ginjal.
Metode: Dilakukan pengukuran IL-6 pada ginjal tikus Wistar dengan ELISA. Tikus dibagikan menjadi tikus sehat sebagai kontrol negatif dan prediabetes. Induksi prediabetes dilakukan dengan diet tinggi lemak dan glukosa bersama dengan injeksi streptozotocin. Tikus prediabetes dibagikan lagi menjadi tiga kelompok intervensi, yaitu kontrol positif dan suplementasi vitamin D3 dengan dosis 100 dan 1000 IU/kgBB/hari. Penelitian dilaksanakan selama 12 minggu. Rerata konsentrasi IL-6 dibuatkan rasio dengan konsentrasi protein total sampel. Perbedaan antarkelompok rasio tersebut diujikan menggunakan one-way ANOVA dengan IBM SPSS Statistics ver. 26 dari IBM Corp.
Hasil: Rerata rasio IL-6/protein total adalah 2,379 ng/mg protein untuk kontrol positif. Kontrol negatif memiliki rerata rasio 2,053 ng/mg protein. Kelompok intervensi 100 dan 1000 IU/kgBB/hari memiliki rerata rasio 1,692 dan 1,609 ng/mg protein. Tren penurunan IL-6 dengan suplementasi vitamin D3 pada kelompok prediabetes tidak bermakna.
Kesimpulan: Suplementasi vitamin D3 dengan dosis 100 dan 1000 IU/kgBB/hari pada tikus model prediabetes tidak menurunkan IL-6 pada ginjal.
.....Background: Prediabetes is a metabolic condition defined by subthreshold increase in blood glucose for diabetes diagnosis. Prediabetes causes low-level inflammation that may impair kidney function. Vitamin D3 has been shown to reduce proinflammatory factors, such as IL-6 and alleviate kidney inflammation in paracetamol toxicity. IL-6 can also be used as a kidney inflammation marker. Therefore, vitamin D3 provides an unexplored potential as an agent to reduce prediabetic kidney inflammation.
Methods: IL-6 measurement was conducted on frozen Wistar rat kidneys using ELISA. The rats were grouped into healthy for negative control and prediabetic groups. Prediabetes was induced by a high fat and glucose diet and streptozotocin injection. Prediabetic rats were further grouped into a positive control group and two intervention groups with vitamin D3 supplementation doses of 100 and 1000 IU/kgBM/day. The experiment was run for 12 weeks. Mean IL-6 concentration was ratioed with total sample protein. The ratios between the groups were tested with one-way ANOVA using IBM SPSS Statistics ver. 26 by IBM Corp.
Results: The healthy rat kidneys had a IL-6 to protein ratio of 2.379 ng/mg protein. Meanwhile, the ratios for the prediabetic rat model groups were 2.053, 1.692, and 1.609 ng/mg protein for the no supplementation, 100 IU/kgBM/day, and 1000 IU/kgBM/day groups respectively. Despite a decreasing trend with increasing supplement dosages, no statistically significant difference was found between any group.
Conclusion: Vitamin D3 supplementation at 100 and 1000 IU/kgBM/day in prediabetic rat models does not

significantly reduce kidney IL-6.