

ABSTRAK

Latar belakang : Asupan tinggi serat dan pati resisten merupakan penanganan non-farmakologis yang penting pada DM. Asam lemak rantai pendek hasil fermentasi serat dan pati resisten memiliki efek terhadap metilasi promotor gen leptin, kadar leptin, peptida YY, dan ghrelin. Efek penghentian intervensi asupan serat dan pati resisten terhadap metilasi promotor gen leptin dan ketiga hormon tersebut belum banyak dilaporkan .

Tujuan: Mengetahui pengaruh pemberian makanan ringan kaya serat (*snack*) terhadap metilasi promotor gen leptin, dan kadar leptin, PYY serta ghrelin pada pasien DM tipe 2.

Metode : Desain studi longitudinal dengan pemeriksaan berulang terhadap 20 pasien DM tipe 2 diberikan 32 g/hari *snack* selama 4 minggu. Pemeriksaan darah puasa dilakukan sebelum pemberian *snack*, 4 minggu setelah makan *snack*, 4 minggu setelah berhenti makan *snack* dan 8 minggu setelah berhenti makan *snack*. Analisa metilasi promotor gen leptin menggunakan metode *Methylation Specific Polymerase Chain Reaction*, sedangkan kadar leptin, PYY, dan ghrelin menggunakan metode ELISA. Analisis komparasi status metilasi promotor gen leptin menggunakan uji Cochran post hoc McNemar, sedangkan komparasi kadar leptin, ghrelin, dan PYY menggunakan uji repeated ANOVA post hoc Bonferroni atau uji Friedman post hoc Wilcoxon. Analisis korelasi Pearson atau Spearman untuk mengetahui hubungan antara status metilasi promotor gen leptin dengan kadar leptin dan antar variabel penelitian

Hasil : Terjadi penurunan frekuensi promotor gen leptin setelah 4- dan 8-minggu berhenti makan *snack*. kadar leptin menurun setelah pemberian *snack* dan meningkat kembali setelah 8 minggu berhenti mengonsumsi *snack*. Tidak ditemukan korelasi antara status metilasi dengan kadar leptin dalam darah. Kadar PYY meningkat setelah pemberian *snack* dan mulai menurun setelah 4 minggu konsumsi *snack* dihentikan. Sebaliknya kadar ghrelin menurun setelah mengonsumsi *snack* dan mulai meningkat setelah 8 minggu konsumsi *snack* dihentikan. PYY berkorelasi terbalik dengan IMT dengan kekuatan sedang, tidak ditemukan korelasi antar variabel yang lain.

Kesimpulan : konsumsi *snack* dapat menurunkan status metilasi pada promotor gen leptin, kadar leptin, dan kadar ghrelin serta meningkatkan kadar PYY dalam darah dan penghentian konsumsi *snack* mengembalikan kadar ketiga hormon di atas ke keadaan sebelum diberikan intervensi. Perubahan status metilasi berjalan lambat sedangkan perubahan kadar leptin, ghrelin dan PYY relatif lebih cepat

Kata kunci : Diabetes melitus, *short chain fatty acid*, *metthylation*, PYY, ghrelin, *epigenetic*

ABSTRACT

Background: High intake of fiber and resistant starch is an important non-pharmacological treatment in DM. Short chain fatty acids as a product of fiber and resistant starch fermentation have an effect on promoter methylation of leptin gene, leptin, YY peptides, and ghrelin levels. The effect of stopping intervention on fiber intake and resistant starch in promoter methylation of leptin gene, levels of leptin, PYY and ghrelin has not been widely reported.

Objective: To determine the effect of fiber-rich snacks on promoter methylation of leptin gene, and levels of leptin, PYY and ghrelin in type 2 DM

Methods: A longitudinal study with repeated examinations design of 20 type 2 DM was given 32 g / day snack for 4 weeks. Fasting blood was analyzed before intervention, 4 weeks after eating snacks, 4 weeks and 8 weeks after stop eating snacks. Analysis of promoter methylation of leptin gene using MSP method, and ELISA technique for levels of leptin, PYY, and ghrelin. Comparative analysis of the methylation promoter of the leptin gene using the Cochran post hoc McNemar test, and comparison analysis of leptin, ghrelin, and PYY levels using repeated ANOVA post hoc Bonferroni or Friedman post hoc Wilcoxon test. Pearson or Spearman correlation analysis was using to determine the relationship between the methylation status of leptin gene promoter with leptin levels and between variables

Results: Methylation promoter of leptin gene decreased after 4- and 8-weeks stop consuming snacks. Leptin levels decreased after 4 weeks consuming snacks and the levels of leptin rise after 8 weeks stop eating snacks. There was no correlation between methylation and leptin levels in the blood. PYY levels increased after 4 weeks consuming snack and down after 4 weeks stop consuming snacks. Conversely ghrelin levels decreased after 4 weeks consuming snacks and the levels increase after 8 weeks stop consuming snack. Peptide YY is correlated with BMI inversely with medium strength, there is no correlation between other variables

Conclusion: snack consumption decrease the promoter methylation of leptin gene, leptin, ghrelin levels and increase PYY levels in the blood. The cessation of snack consumption lead the hormones to the levels before intervention. Methylation process slower than leptin, ghrelin and PYY levels changing.

Keywords: Diabetes mellitus, short chain fatty acid, methylation, PYY, ghrelin, epigenetic