

FNES -260

Research Question

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1. **Nutrition question:** Is a gluten-free diet going to help improve my diabetes?

2. **Research Question:** Does avoiding the consumption of gluten, help to improve the condition of patients that suffer from insulin resistance (diabetes mellitus type 2)

3. **PICO terms:**
Population: People living in the United States
Intervention / independent variable: Gluten Consumption
Control / Comparison: No consumption of Gluten
Outcome / dependent variable: Insulin resistance

4. Abstracts:

Abstract 1.

Nutrients. 2018 Nov 13;10(11). pii: E1746. doi: 10.3390/nu10111746.

Possible Prevention of Diabetes with a Gluten-Free Diet.

Haupt-Jorgensen M1, Holm LJ2, Josefsen K3, Buschard K4.

Gluten seems a potentially important determinant in type 1 diabetes (T1D) and type 2 diabetes (T2D). Intake of gluten, a major component of wheat, rye, and barley, affects the microbiota and increases the intestinal permeability. Moreover, studies have demonstrated that gluten peptides, after crossing the intestinal barrier, lead to a more inflammatory milieu. Gluten peptides enter the pancreas where they affect the morphology and might induce beta-cell stress by enhancing glucose- and palmitate-stimulated insulin secretion. Interestingly, animal studies and a human study have demonstrated that a gluten-free (GF) diet during pregnancy reduces the risk of T1D. Evidence regarding the role of a GF diet in T2D is less clear. Some studies have linked intake of a GF diet to reduced obesity and T2D and suggested a role in reducing leptin- and insulin-resistance and increasing beta-cell volume. The current knowledge indicates that gluten, among many environmental factors, may be an etiopathogenic factors for development of T1D and T2D. However, human intervention trials are needed to confirm this and the proposed mechanisms.

Abstract 2.

Diabetes Care. 2002 Jul;25(7):1117-22.

A longitudinal study of the effects of a gluten-free diet on glycemic control and weight gain in subjects with type 1 diabetes and celiac disease.

Amin R1, Murphy N, Edge J, Ahmed ML, Acerini CL, Dunger DB.

OBJECTIVE:

To describe the longitudinal growth characteristics and glycemic control in type 1 diabetic children diagnosed with celiac disease and started on a gluten-free diet (GFD).

RESEARCH DESIGN AND METHODS:

Data on growth and glycemic control for 11 case subjects diagnosed with celiac disease (cd(+) group) and started on a GFD were collected prospectively, and two control subjects without celiac disease matched for age, sex, and duration of diabetes (cd(-) group) were selected for comparison.

RESULTS:

In the period between diagnosis of type 1 diabetes and start of a GFD in the cd(+) compared with the cd(-) group, BMI standard deviation score (SDS) was lower (-0.2 vs. 0.7, $P = 0.015$), as was HbA(1c) (8.9 vs. 9.8%, $P = 0.002$). In a regression model the cd(+) group had lower BMI SDS ($P < 0.001$) and lower HbA(1c) ($P = 0.04$), independent of other variables. On a GFD, BMI SDS increased by 12 months in the cd(+) group and then was no different than the cd(-) group (1.1 vs. 1.0, $P = 0.11$), whereas HbA(1c) improved further within case subjects compared with pre-GFD (8.9 vs. 8.3%, $P = 0.002$). On a GFD, case subjects in contrast to control subjects showed no deterioration in HbA(1c) during the years of puberty (8.3 vs. 10.0%, $P = 0.022$).

CONCLUSIONS:

In children with type 1 diabetes, untreated celiac disease resulted in lower BMI SDS and lower HbA(1c). Recovery of BMI SDS with a GFD was associated with further improvement in HbA(1c) as compared with pre-GFD, with no expected deterioration in glycemic control during puberty. These apparent clinical benefits need confirming by larger studies.

5. Answer (My conclusions): Based on the browsing of research literature, it seems that eliminating gluten from the diet, may improve the health of the patients suffering from insulin resistance (diabetes type 2).

6. References:

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3. J Nutr Biochem. 2013 Jun;24(6):1105-11. doi: 10.1016/j.jnutbio.2012.08.009. Epub 2012 Dec 17. Gluten-free diet reduces adiposity, inflammation and insulin resistance associated with the induction of PPAR-alpha and PPAR-gamma expression. Soares FL1, de Oliveira Matoso R, Teixeira LG, Menezes Z, Pereira SS, Alves AC, Batista NV, de Faria AM, Cara DC, Ferreira AV, Alvarez-Leite JI.
4. Diabetes Metab Res Rev. 2016 Oct;32(7):675-684. doi: 10.1002/dmrr.2802. Epub 2016 Apr 21. Gluten-free diet increases beta-cell volume and improves glucose tolerance in an animal model of type 2 diabetes. Haupt-Jorgensen M1, Buschard K2, Hansen AK3, Josefsen K2, Antvorskov JC2.
5. J Clin Endocrinol Metab. 2003 Jan;88(1):162-5. Six months of gluten-free diet do not influence autoantibody titers, but improve insulin secretion in subjects at high risk for type 1 diabetes. Pastore MR1, Bazzigaluppi E, Belloni C, Arcovio C, Bonifacio E, Bosi E.