Type 2 Diabetes: Fibre

Summery

Fibre can be classified as being water soluble or insoluble. Viscous or soluble fibre is present in many forms such as psyllium, guar gum, ground flax seed, beta-glucan, xanthan gum and pectin. Viscous fibre dissolves in water to form a viscous gel in the gut, therefore reducing the rate of nutrient absorption and insulin response, reducing cholesterol absorption, and increasing satiety. Viscous fibre also stimulates mucous production, which is beneficial to gut microbiome, and increases short chain fatty acid production, which exerts a prebiotic effect.

Indication & Benefits

Improve glycaemic control in adults with type 2 diabetes.

Contraindication and Adverse Effects

Precautions

Needs to be taken with water.

Adverse effects

Low or no adverse effects with sufficient fluid intake.

Practical Description

Intervention

Viscous fibre has been shown to significantly reduce HbA1c, fasting blood glucose and insulin resistance. A systematic review and meta-analysis showed the median dose of 13.1 g/day of viscous fibre was associated with a HbA1c reduction of 0.58%. (Note that the US Food and Drug Administration has a threshold of 0.3% for new antihyperglycaemic agent development).

There is currently no recommended intake specifically of viscous fibre. However, a daily intake of 25–29 g/day of total dietary fibre (i.e. viscous fibre, insoluble fibre and resistant starch) is recommended for Australian adults. This has been associated with a risk reduction in cardiovascular disease outcomes.

Tips and challenges

- Viscous fibre can be taken as supplements in capsule or powder form. The capsules should be

swallowed with a glass of water. The powder needs to be mixed with a glass of water before consuming. Note that a 7 g dose (approximately 2 teaspoons) of “Metamucil” powder contains 2.4 g of viscous fibre and 2 teaspoons of “Benefiber” contain about 3 g of viscous fibre. Refer to the product’s nutrition labels.

- Viscous fibre can be taken once a day or in divided doses throughout the day, e.g. three times a day.
- Sources of viscous fibre in foods include oats, legumes and citrus. To meet an average of 13 g/day of viscous fibre, the following foods can be consumed:
    - 45 g oats or muesli (3–5g)
    - ½ cup legumes or lentils (5–8 g)
    - 1 tablespoon of chia seeds (6 g)
    - Fresh fruit and vegetables (e.g. bananas 2 g)

Refer to the Consumer Resources for food group portion size.
Introduce simple changes to the patient’s diet to increase fibre intake:

- Increase fibre intake slowly or spread across the day to reduce excess wind or bloating
- Ensure there is plenty of fluid in the diet to prevent constipation or help stools pass more easily. Aim for 6–8 glasses per day
- Start the day with a high fibre breakfast cereal (rolled oats in porridge or muesli). Add fresh fruit, chia seeds or fibre supplement
- Chia seeds or fibre supplements can be added to smoothies
- Lentils and legumes can be added to salads, soups, casseroles, falafel
- Include vegetables at snacks and meals (aim for 5 serves per day)
- Include 2 serves of fruit each day

Availability

Available as dietary supplements (powder or capsules) as over-the-counter products from supermarkets, pharmacies and health food stores. Examples of brands include “Metamucil” (psyllium husk) and “Benefiber” (wheat dextrin). Also available as food products, e.g. enriched oats (“Betaglucare”) or naturally occurring in standard oats.

Resources

- **Dietitians Association of Australia**
- **Baker IDI Fibre fact sheet**
- **Qld Health NEMO resource**
- **Nutrition Australia Fibre resource**

Evidence

GRADE: Moderate certainty for HbA1c, fasting glucose, fasting insulin and HOMA-insulin resistance

References

1. Jovanovski E, Khayyat R, Zurbau A, et al. Should viscous fiber supplements be considered in diabetes control? Results from a systematic review and meta-analysis of randomized controlled trials. Diabetes Care. 2019 Jan 7. doi: 10.2337/dc18-1126.

1. Reynolds A, Mann J, Cummings J, et al. Carbohydrate quality and human health: a series of systematic reviews and meta-analyses. Lancet. 2019 Jan 10. doi: 10.1016/S0140-6736(18)31809-9.