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Treating type 2 diabetes as a problem of insulin resistance: Use of low-carb and intermittent fasting in India

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Abstract

India is facing an alarming increase in the type 2 diabetes epidemic. While genetics do play a role, lifestyles including processed food, refined carbohydrates, sedentary patterns, poor quality sleep, lack of strength training, protein-deficient diets and chronic stress have accelerated the disease trends in the last decade. Treating type 2 diabetes as a problem primarily of insulin resistance means shifting the focus from lowering glucose to lowering insulin, using the twin-cycle hypothesis [1]. The fact that a low-carbohydrate approach is a viable way to reduce the prescription burden is an established treatment principle endorsed by the American Diabetes Association [2]. The use of therapeutic fasting to reverse insulin resistance has now been reported[3]. We share our clinical experience with this case report of a 58-year-old male with a history of type 2 diabetes since 2005. When we first evaluated him in November 2019, he weighed 110 kg, and his HbA1c was 13.2% despite taking 70 units of basal insulin and 50-55 units of bolus insulin three times a day (total daily dose ~220 units). His fasting C-peptide level was 1.95 ng/ml confirming pancreatic beta-cell function. He commenced a low carbohydrate diet under close medical supervision, with protein intake of 0.8-1.0 gram per kilogram reference body weight over three main meals, from both plant and animal sources. With the addition of healthy unprocessed fat, his appetite reduced, and we started him on intermittent fasting. Over the next six months, we stopped his insulin dose and kept him on metformin alone. He experienced one episode of hypotension and presyncope attributed to low sodium intake, after which we tapered his anti-hypertensive medication. He has lost 23 kilograms, started exercising, the HbA1c has dropped to 8.2% and the triglycerides are down from 184 mg/dl to 83 mg/dl.. We now have him on a fasting regimen of 36 to 48 hours while consuming approved fasting fluids. We are confident that his blood work will be even better at the next evaluation.

High cortisol and low folate are the only routine blood tests prognosticating probable Alzheimer's disease after age 75, Serum total homocysteine levels were significantly higher and serum folate and vitamin B12 levels were lower in patients with dementia of Alzheimer type and patients with histologically corroborated AD than in controls .Low blood levels of folate and vitamin B12, and ascended homocysteine (tHcy) levels were associated with AD. Low blood folate and raised homocysteine concentrations are associated with poor cognitive function. Folic acid supplementation ameliorates cognitive function.This diminutive pilot study examined the effect of folic acid supplementation on incipiently diagnosed patients with AD. Folic acid amended cognition and markers of inflammation. Study findings have suggested a sodality between Alzheimer's disease (AD) risk and several vitamins and have notionally theorized about their utilization as preventive agents. Here, we examine whether total intake (intake from diet plus supplements) of antioxidant vitamins (E, C, carotenoids) and B vitamins (folate, B6, and B12) is associated with a minimized risk of AD…After a mean follow-up of 9.3 years, AD developed in 57 participants. Higher intake of folate (RR, 0.41; 95% confidence interval [CI], 0.22 to 0.76), vitamin E (RR, 0.56; 95% CI, 0.30 to 1.06), and vitamin B6 (RR, 0.41; 95% CI, 0.20 to 0.84) were associated individually with a decremented risk of AD after adjusting for age, gender, inculcation, and caloric intake

When these 3 vitamins were analyzed together, only total intake of folate at or above the RDA(RR, 0.45; 95% CI, 0.21 to 0.97) was associated with a paramount decremented risk of AD. No sodality was found between total intake of vitamins C, carotenoids, or vitamin B12 and jeopardize of AD.This study's objective was to explore the sodalities of low serum levels of vitamin B12 and folate with AD occurrence. When utilizing B12 ≤150pmol/L and folate ≤10 nmol/L to define low calibers, compared with people with mundane levels of both vitamins, subjects with low calibers of B12 or folate had twice higher risks of developing AD

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(relative risk [RR] = 2.1, 95% CI = 1.2 to 3.5). These sodalities were even more vigorous in subjects with good baseline cognition (RR = 3.1, 95% CI = 1.1 to 8.4). Homogeneous relative risks of AD were found in subjects with low calibers of B12 or folate and among those with both vitamins at low calibers.

In type 2 diabetic subjects, hypothalamic-pituitary-adrenal activity is enhanced in patients with diabetes complications and the degree of cortisol secretion is cognate to the presence and number of diabetes complications. Short-term oral folic acid supplementation significantly enhances endothelial function in type 2 diabetic patients Data implicatively insinuate that folate can be habituated to ameliorate nitric oxide status and to recuperate endothelial dysfunction in patients with Type II diabetes.Our results provide a vigorous rationale for the initiation of studies that investigate whether supplementation with folic acid obviates future cardiovascular events in this patient group. Average Tardy night salivary cortisol levels (nmol/l) in diabetics were significantly higher than in non-diabetics.

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