

The Mediterranean Diet in the Management and Prevention of Type 2 Diabetes

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ABSTRACT

The Mediterranean diet has been extensively. Appears effective in the prevention and management of type 2 diabetes [4, 5, 6, 15]. Following this dietary pattern is associated with improved blood glucose control, enhanced indicators and a reduced risk of developing T2D [1, 6, 22, 23]. Indeed, meta-analyses of studies revealed significant improvements in glucose management with reductions in HbA1c, up to 0.47% [1, 6]. Moreover, a variant of this diet with carbohydrates could delay the necessity for medication in newly diagnosed T2D patients [4, 11]. This dietary approach originates, from eating patterns found throughout the Mediterranean region, where local customs and ingredients vary by location [31, 32]. It emphasizes plant-based foods relies on oil as the primary fat source permits moderate alcohol consumption and maintains limited meat servings [30, 33]. One variant—referred to as Indo-Mediterranean—could offer benefits due to its unique composition [24]. It reduces inflammation combats harm and positively alters gut microbiota [15]; because it's easy for individuals to maintain specialists consider it a viable option, for long-term health [19, 27].

KEYWORDS: Mediterranean diet, Type 2 Diabetes, Glycemic Control, Cardiovascular Risk Factors, Diabetes Prevention, Gut Microbiota, Anti-inflammatory, Antioxidant, Indo-Mediterranean diet.

INTRODUCTION

Recently the Mediterranean diet has attracted increased attention from scientists since it promotes health and is sustainable over time. Based on the habits of people living around the Mediterranean Sea during the 1960s this eating style is linked with numerous health benefits—particularly in preventing or managing chronic conditions such, as type 2 diabetes [4, 5, 6, 15]. It is not a regimen; rather it represents typical eating habits seen throughout various countries bordering that sea [31, 32]. As cultures and ingredients vary across the region the specifics of the diet also change [31, 32]. For the majority of individuals adhering to it the diet emphasizes plant-based options like fruits, vegetables, whole-grain breads, legumes, nuts and seeds—all rich, in polyphenols [30]. Additionally, people occasionally consume some alcohol reduce their intake of meat or processed foods and rely heavily on oil and legumes [33]. Adhering closely to that dietary pattern is associated with a decrease, in overall mortality a reduced likelihood of cardiovascular problems and a diminished risk of developing or succumbing to cancer [26].

A discussed variant in studies is the Indo-Mediterranean diet. Comprising millet, porridge, beans along with spices such as turmeric, cumin, fenugreek or coriander potentially enhancing advantages for inflammation and cardiovascular health [24]. While the traditional Mediterranean diet is recognized for reducing diseases extending lifespan and improving daily quality of life [16, 32] modifications arise due, to local customs or traditions [31]. Studies indicate that adhering closely to that typical diet is associated with decreased mortality rates overall a reduction in cardiovascular deaths and a lowered chance of cancer [29]. This article aims to explore versions of the Mediterranean diet examining their impact, on glycemic control cardiovascular risk factors and the prevention of type 2 diabetes.

METHODS

This review combines outcomes from reviews, extensive data analyses and results from rigorously designed trials examining the impact of the Mediterranean diet on type 2 diabetes—both in prevention and management. Online searches extended up, to 2015 for some summaries [6] whereas more recent ones included studies published up to 2024 [34]. To be eligible studies had to compare the Mediterranean diet with an eating pattern run for at least six months and include at least 30 participants per group when included in a pooled analysis [6]. They evaluated factors such, as blood glucose levels, cardiovascular health markers and the reduction of metabolic syndrome indicators [6].

Extended monitoring studies and randomized controlled trials. Such as the known PREDIMED study. Were also included to investigate associations between adherence to this diet and a reduction, in new diabetes cases [16, 20, 21].

FINDINGS AND RESULTS

Impact on Glycemic Control

Numerous investigations, including reviews and rigorous trials demonstrate that the Mediterranean diet significantly improves blood sugar control compared to options such as low-fat diets [1, 6, 12]. Individuals following this eating style frequently experience a reduction in HbA1c—a marker indicating long-term glucose regulation—, with decreases ranging from 0.1% to 0.6% [5, 6]. In an analysis levels declined by almost 0.5% when individuals adhered to the Mediterranean-style diet outperforming many other dietary approaches [1]. No research reported that this eating pattern made managing blood sugar more difficult [5, 6]. A low-carbohydrate variation of the Mediterranean diet can delay the time until individuals newly diagnosed with type 2 diabetes require blood sugar-lowering medications— 44% following this regimen needed drugs after four years compared to 70% on a low-fat diet [4, 8, 11]. At the time the Mediterranean Lifestyle Program resulted in significant reductions in HbA1c levels among elderly women, with T2D [28].

Cardiovascular Risk Factors

In addition to controlling blood glucose the Mediterranean diet aids in addressing risks associated with type 2 diabetes [6, 19]. Advantages such as body weight decreased total cholesterol and an increase in HDL cholesterol have been observed [1, 6, 9]. Studies indicate improvements in indicators lowered blood pressure and alterations, in gut microbiota that might alleviate chronic inflammation [19, 27]. Following a three-month period individuals following this diet— those including extra olive oil or nuts—experienced better blood sugar control reduced systolic blood pressure and an enhanced cholesterol balance [9]. Adhering closely to this approach is associated with increased adiponectin concentrations, in women with diabetes with consumption of alcohol, nuts and whole grains playing a key role [13]. A Mediterranean-inspired dietary pattern may contribute to decreasing the prevalence of metabolic syndrome well as cardiovascular hazards [7]. For heavier people with type 2 diabetes, cutting carbs while following this diet may boost heart health markers [3].

Prevention of Type 2 Diabetes

Individuals who adhere closely to the Mediterranean diet generally experience a lower incidence of diabetes – some studies indicate roughly a 20% reduction in risk [6, 23]. Moving forward populations consuming diets more in line with this pattern exhibited fewer new diabetes cases [16].

Simply increasing the diet score by two points was associated with a reduction in diabetes risk by, then one-third [16]. In the PREDIMED study, conducted across sites participants following a Mediterranean diet supplemented with either olive oil or nuts experienced a significant reduction, in their risk of type 2 diabetes [20]. When both Mediterranean diet groups were. Compared to the control group diabetes incidence decreased by 52% [21]. This suggests that altering habits may help prevent diabetes in some older adults—without requiring calorie restriction or increased physical activity [20]. Moreover, a prospective study by the UK Biobank identified an association: adhering closely to a Mediterranean-style lifestyle reduced the likelihood of type 2 diabetes in individuals outside the Mediterranean area cutting the risk by 30% for those most committed [14]. Individuals with pronounced Mediterranean Diet patterns experienced an 18% reduction, in T2DM risk compared to those who adhered strictly [34].

DISCUSSION AND CONCLUSION

An increasing amount of research indicates that the Mediterranean diet aids in preventing type 2 diabetes well as improving blood sugar control and cardiovascular health in individuals with diabetes [4, 17, 25].

The benefits stem from consuming an intake of natural, minimally processed foods such as fruits, vegetables, whole grains, legumes, fish and olive oil [15, 19]. These foods offer -inflammatory and antioxidant advantages also influencing gut microbiota, which are important, for diabetes management [15, 27]. Adhering strictly to this pattern is linked to specific gut microbial profiles, including reduced *E. Coli*, an increased ratio of bifidobacteria to *E. Coli*, higher *Candida albicans* presence and raised acetate concentrations [18]. Favorable changes in microbes—such as Firmicutes, Bacteroidetes and Bifidobacteria—are observed in individuals with prediabetes or type 2 diabetes [2]. The Mediterranean diet is generally practical for the majority making it effective, for long-term health management [19, 27]. Combining this diet with physical activity enhances its beneficial effects significantly [27]. Due to its variety—including traditional options as well as newer adaptations like the Indo-Mediterranean style—it accommodates diverse cultures and preferences promoting its adoption as an effective dietary strategy worldwide [24]. While numerous studies back its advantages for blood glucose control and cardiovascular health discussions persist concerning aspects such, as weight gain; experts concur that comprehensive long-term studies are necessary to fully grasp its prolonged effects [25]. A combination of components. Consider fruit, vegetables, nuts, legumes, whole grains, seafood, plus moderate small amounts of red wine. Provides crucial nutrients and beneficial substances like fiber, magnesium, antioxidants and healthy fats (MUFA) which collectively aid in lowering body weight, HbA1c

harmful cholesterol (LDL). Internal stress-related harm while boosting good cholesterol (HDL). All contributing to improved results and defense, against type 2 diabetes [10].

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