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Unit No. 3

DIETARY INTERVENTIONS FOR WEIGHT LOSS

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ABSTRACT

Obesity is a complex and chronic condition that requires continuing care. A variety of diet plans are available for use in the clinical setting. Exactly what type of diet is the most beneficial remains up for debate. Numerous clinical trials have been carried out over the years comparing an array of dietary interventions for weight loss, including calorie-restricted diets, altered macronutrient composition diets, or specific dietary patterns. This paper will provide an overview of some of the evidence-based dietary interventions for clinical practice.

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INTRODUCTION

Obesity is a serious global epidemic associated with numerous metabolic complications, including type 2 diabetes (T2DM), hypertension, cardiovascular disorders, and several cancers. The aetiology of obesity is multifactorial, involving an interplay of genetic, biological, environmental, social, cultural, and behavioural factors. Even though a successful weight loss strategy should be individualised and address all the underlying causes of obesity, dietary and lifestyle interventions remain the cornerstone of treatment. However, the optimal dietary approach to weight loss is still a subject of debate amongst experts, healthcare professionals, and the public, as studies have failed to demonstrate the superiority of one diet plan over another in the long term. Comprehensive assessment of an individual's dietary habits and lifestyle should be the first step in deciding on the best dietary intervention for weight loss and avoiding a one-size-fits-all approach. There is evidence that even modest weight loss of 5-8 percent body weight achieved with diet and lifestyle interventions improves glycaemia, blood pressure, lipid profile, mobility, and quality of life.[1-2] Greater weight loss might be needed to produce health benefits in individuals with morbid obesity or multiple comorbidities.

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ENERGY RESTRICTION DIET INTERVENTIONS

Energy-restricted diets range from continuous or intermittent diet plans with moderate to severe caloric deficit depending on the health status and weight loss goals of a patient or client. A calorie deficit of at least 500-750 per day is recommended to achieve a weight loss of 0.5-1.0 kg per week, which is the standard approach in clinical practice. These moderate energy deficit diet plans are formulated using healthy eating and exercise principles incorporating individual food preferences and behaviour modification to increase compliance. However, specially formulated meals or liquid meal replacements have also been employed to help achieve the necessary caloric deficit to drive weight loss in certain individuals after considering their health status, dietary preferences, and cost.

On the other hand, Very Low Energy Diet (VLED) restricts energy intake to 800 calories per day or less, which results in a more rapid weight loss and improvement of obesity related comorbidities. VLEDs based on liquid meal replacements are formulated to deliver adequate levels of essential nutrients and improve adherence. They have been underutilised in clinical practice in view of concerns over the potential loss of lean body mass, binge eating behaviour, and subsequent weight regain due to rapid weight loss. However, when clinically supervised, there is no evidence of VLED causing binge eating behaviour or resulting in worse outcomes on knee strength, handgrip strength, or bone compared to moderate energy-restricted diets in short-term studies lasting 3-6 months.[3-5] The use of VLEDs in supervised conditions for up to three months in patients who fail to meet a target weight or metabolic targets with a standard approach is gaining support from institutions such as the National Institute for Health and Clinical Excellence and clinicians. A structured, individualised weight maintenance programme with gradual readjustment to normal eating after VLED is required to maintain weight loss and metabolic benefits.[6-8]

Intermittent energy restriction (IER) is another dietary approach for weight loss that involves periods of fasting and eating with or without calorie restriction. Popular types of IER include alternate-day fasting (ADF), the 5:2 fast (five days of normal eating and two days of restricted eating per week), and time-restricted feeding.[9] In time-restricted feeding trials, the fasting window varies from 12 to 20 hours with an *ad libitum* diet during the feeding hours. The key appeal of IER is high compliance, easy sustainability compared to continuous daily calorie restriction or low carbohydrate diets and other potential health benefits. However, it is important to counsel patients about making healthy food choices when they are not fasting to improve their clinical outcomes further.

The evidence suggests that IER is safe for most healthy adults and achieves comparable weight loss and metabolic improvements to continuous energy restriction.[10-11] In one recent meta-analysis, both intermittent and continuous energy restriction resulted in a similar weight loss, maintenance, and improvements in cardiovascular risk factors.[12] However, feelings of hunger may be more pronounced during IER. Many studies on IER are short-term and involve a small number of subjects. Therefore, longer-term trials would help build confidence in recommending these diet plans.

ALTERED MACRONUTRIENT COMPOSITION DIET INTERVENTIONS

Studies have demonstrated that eating plans with varying carbohydrate and fat composition can be used effectively and safely in the short term (1-2 years) to achieve weight loss. Low and very low carbohydrate diets, often referred to as "keto" diets, have gained popularity amongst healthcare professionals and the public as an effective tool for weight loss and means to reduce metabolic complications associated with overweight and obesity. However, there is no consensus in the literature on the definition of a low carbohydrate and a very low carbohydrate diet. Low carbohydrate diets usually provide less than 26 percent of calories from carbohydrates while very low carbohydrate diets limit carbohydrate calories to less than 10 percent.[13]

The ketogenic diet was initially developed to treat severe epilepsy in infants and children under medical supervision. It is a very low carbohydrate and high-fat diet plan, resulting in a state of ketosis where fat is being burnt for fuel instead of glucose. True ketogenic diets used in clinical settings can limit carbohydrates to as little as 5 percent of calories, primarily from non-starchy vegetables, and provide up to 85 percent calories from fat with enough protein to preserve lean body mass but maintain ketosis.

However, when used as a tool for weight loss, these "keto" diet plans vary in the proportion of carbohydrates, fat, and protein they provide. Furthermore, there is an individual variation in the level of carbohydrate and protein intake that is compatible with ketosis. Therefore, personalisation of the diet and monitoring of ketone levels helps to achieve weight loss goals. "Keto flu" is a frequent side effect of a "keto" diet, which can include light-headedness, fatigue, headaches, nausea, and constipation, in particular during the adaptation phase. Multivitamin, mineral, and fibre supplements can be considered in some individuals to reduce side-effects.

A recent review of evidence on low and very low carbohydrate diets found them to be effective but not superior to other weight-loss diets.[14] There was no difference in weight loss between lower carbohydrate (4-45 percent calories)/ higher fat (30-75 percent calories) diets compared to higher carbohydrate (50-65 percent calories)/lower fat (20-25 percent calories) diets when protein and energy levels were kept the same.[13,15] However, studies in overweight, diabetic patients following a low carbohydrate diet show improvements in triglycerides and HDL cholesterol levels, insulin sensitivity, and glycaemic control with mixed effects on LDL cholesterol.[16,17]

One advantage that "keto diets" may offer is controlling the cravings and hunger often reported with other diet plans. A review published in 2015 found that individuals adhering to a ketogenic diet reported significantly less hunger and desire to eat compared with baseline.[18] Even though well-formulated ketogenic diets may offer short-term health benefits in some individuals, they are difficult to sustain, and long-term risks and benefits are not fully understood in the absence of long-term studies.

SPECIFIC DIETARY PATTERNS

Diets focusing on dietary patterns such as the Dietary Approaches to Stop Hypertension (DASH) diet, Mediterranean diets, and Plant Based Diets (PBD) have also been studied in weight loss trials.

The DASH diet recommends specific servings of different food groups depending on daily caloric needs. It focuses on whole grains, fruit and vegetables, fat-free and low-fat dairy, lean meat, fish, and poultry. A meta-analysis revealed that overweight and obese adults on the DASH diet lose more weight than controls following a standard diet in studies ranging from 8-24 weeks.[20] Calorie-restricted DASH diet led to even greater weight loss when compared to other low energy diets.

Mediterranean diets emphasise the intake of vegetables, fruit, legumes, nuts, whole grains, and olive oil as the main source of fat, with moderate amounts of fish and poultry, low intake of red meat, and moderate consumption of wine. Meta-analysis of RCTs found that energy-restricted Mediterranean diets achieve as much or more weight loss than low-carbohydrate and low-fat diets with or without energy restriction among overweight and obese adults when followed for at least six months.[19]

A variety of PBDs including vegan and vegetarian diets have been investigated for their beneficial effects on weight loss and associated comorbidities. In a recent systematic review, PBDs were found to be effective in reducing weight and waist circumference in individuals with T2DM, especially in studies with a duration of at least 16 weeks.[21] PBDs are characterised by high intake of dietary fibre from wholegrains, vegetables, and legumes, and low glycaemic index, which may enhance satiety and improve glycaemic control.

The DASH, Mediterranean diet, and PBDs can be safe, effective, and sustainable weight loss eating plans that also improve metabolic complications.

CONCLUSION

In conclusion, a variety of dietary approaches, with sufficient reduction in energy intake and high level of dietary adherence, can produce weight loss. IER and ketogenic diets are gaining popularity and have demonstrated superiority in reducing body fat and improving obesity related metabolic complications in the short-term. However, studies have failed to establish superiority of one diet plan over another in the long-term. Weight loss interventions must address the underlying causes of overweight and obesity and facilitate sustainable behavioural and lifestyle changes to prevent and manage relapse.

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LEARNING POINTS

- **To date, studies have failed to demonstrate the superiority of one diet plan over another as patients can lose weight on any diet in the short term. Long-term effectiveness studies are lacking.**
- **Any dietary approach to weight loss should be individualised and consider the health status, personal preferences, and ability of the person to sustain the recommendations in the plan.**
- **As healthcare professionals, we should be realistic when discussing treatment expectations with our patients and provide ongoing support to ensure long-term weight loss maintenance.**