

THE TRADITIONAL MEDITERRANEAN DIET WITH CORRECT NUTRITIONAL ASSOCIATIONS (TMDCNA) IN LONG-TIME POST-KETOGENIC THERAPY: CASE REPORT WITH BIA/BIVA-BASED ASSESSMENT

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Abstract

As a form of treatment for certain conditions, ketogenic therapy cannot replace good feeding habits based on a diet that includes all macro- and micro-nutrients, such as the Mediterranean diet. However, as the most recent studies have shown, cycles of ketogenic therapy are being used with increasing frequency to treat a wide range of illnesses as well as in beauty regimes, with excellent results.

The aim of this study was to monitor the interaction between ketogenic therapy and Mediterranean diet in terms of its effect on body composition, in order to verify whether the reintroduction of carbohydrates with a low glycaemic index, consumed in accordance with the correct nutritional associations, can stop the weight loss arising from ketogenic therapy. In order to monitor this process, we used bioelectrical impedance analysis (BIA/BIVA).

The results obtained are encouraging, given that the impedance test shows continued loss of fat even after the shift from a ketogenic to a Mediterranean diet, and is constant over time.

Keywords: *correct nutrition, slimming, body composition.*

Introduction

This study sought to monitor, by means of bioelectrical impedance analysis (BIA/BIVA), the effects on a patient's body composition of a Mediterranean diet prescribed during a follow-up regimen as part of long-term post-ketogenic therapy. The ketogenic diet is a therapy that can be cyclically repeated but not maintained for more than 21-28 days, while the Mediterranean diet, backed up by an extensive and increasingly favourable literature, can help the patient to acquire good eating habits that will help them stay healthy.

The Mediterranean diet used in this scientific study differs however from the modern Mediterranean diet, which is frequently erroneously confused with the traditional model, in terms of both the quality of the ingredients and their macro-nutrient content. In this study these two fundamental aspects are carefully analysed.

In addition it has been seen that the traditional Mediterranean diet is perfectly compatible with the correct dietary associations, which were first studied by Ivan Pavlov, who set out its principles in *The work of the digestive glands*, published at the end of the 19th century. Also relevant here are the writings of Herbert M. Shelton and William H. Hay, whose work was further developed by the German Ludwig Walb, and Désiré Mérien. The diet adopted in this case report was therefore called by us the "traditional Mediterranean diet with correct nutritional associations". The principles of this protocol are described in detail below.

Traditional Mediterranean Food

- natural foods, not processed, without additives or chemical preservatives;
- single dishes (pasta and pulses or soup with vegetables and pulses, pasta with tomato sauce with goat's cheese and olive oil, Neapolitan pizza etc.). The meal concludes with a portion of vegetables and a slice of natural bread;
- On average, 55-60% of the Mediterranean diet is made up of carbohydrates, 80% of which are complex (from cereals, especially wholemeal) and 20% are simple (i. e. sugars).
- 10-15% of the Mediterranean diet is made up of proteins, 60% of which are of animal origin

(white meat and oily fish) and 40% of plant origin (pulses and seeds).

- 25-30% of the Mediterranean diet is made up of fats (mainly olive oil, animal fat etc.).
- Seasonal fruit and vegetables are key components;
- The Mediterranean diet also involves physical exercise.

Food consumed every day:

- ✓ Wholemeal cereals and tubers
- ✓ Dried and fresh pulses
- ✓ Fruit and nuts
- ✓ Vegetables
- ✓ Dressings
- ✓ Aromatic herbs
- ✓ Goat's milk
- ✓ Wine

One to three times a week:

- ✓ Meat (chicken, turkey, rabbit)
- ✓ Fish (anchovies, sardines, herrings, garfish, mackerel, scabbardfish, etc...)
- ✓ Eggs

Characteristics of the contemporary dietary model: Processed food (containing "oo" flour, sugar, salt etc.) and food stored with chemical substances (nitrites and nitrates, sulphites, etc.);

- Intensive agriculture, which impoverishes the soil, particularly in terms of trace elements, causing the produce to lose its natural properties and flavour;
- Intensive livestock rearing, which yields meat that is full of antibiotics and hormones;
- Frequent consumption of animal proteins, which has risen from one to three times a week to two or three times a day;
- Meals that rarely end with cooked vegetables;
- Sedentary lifestyles and a lack of physical exercise.

During processing, the bran and the germ are removed from the whole grain. In this way it loses nearly all the vitamins, fibre, essential fatty acids, minerals and rare elements. More importantly, it loses its energy. Only the starches remain, which without the outer layers (the bran) are rapidly

metabolised by the organism, causing a surge in insulin that leads to obesity, diabetes, inflammation and other problems. Another problem is the Intensive agriculture practice. Current cultivation methods involve the use of chemical fertilisers, which impoverish the soil. The resulting produce is consequently low in vitamins, minerals and trace elements. The latter are important in human medicine, acting not only on the symptoms of disease, but above all the root causes, especially where these are linked to tissues and metabolism. They also reinforce the immune system and provide essential support for natural and plant-based therapies. For these reasons, vegans and vegetarians must be very careful to avoid subclinical deficiencies of trace elements.

Excessive consumption of meat and dairy products

Growth factors are indispensable for the growth of children and the repair of tissues damaged by wounds or illness, but if consumed in excess they contribute to overweight and serious diseases. The level of these growth factors depends on our eating habits. For example, people who regularly drink milk and have a diet that is generally rich in animal proteins have higher blood levels of IGF-1 (9), one of the most important growth factors. Insulin is itself a growth factor, and in order to keep levels low, it is necessary to avoid above all foods that increase blood sugar levels, such as o and oo flour, refined sugar, milk and animal fats, the last of which causes hardening of cellular membranes leading to insulin resistance.

Sedentary lifestyle

There is substantial proof that sedentary lifestyles are associated with a greater risk of cancer of the intestine, breast and endometrium, regardless of its contribution to weight gain. There are a number of plausible biological mechanisms by which physical exercise helps to prevent tumours: by reducing insulin, growth factors and inflammation, increasing adiponectin and boosting the immune system. Intense physical exercise increases the production of free radicals but also increases the ability of DNA to repair the damage they cause (7). In addition, physical exercise

mitigates the effects of inflammation associated with obesity (8).

Correct nutritional associations

It is well known that there are foods whose digestion is long and complex and others that are assimilated rapidly. It is also known that different foods require different enzymes and different conditions in order to be digested.

The digestive juices entering the gastrointestinal tract are remarkable in their specificity. The composition of saliva, bile and gastric, enteric and pancreatic juices varies depending on the type of food. The organism seeks, on a case-by-case basis to ensure that the gastrointestinal tract provides the most suitable environment for the transformation of food into assimilable substances.

However, when foods requiring very different conditions in order to be digested are present at the same time, this fine discriminatory capacity is wasted. Inappropriate combinations are badly digested and badly assimilated. They tire the digestive apparatus and the immune system and produce toxic by-products which in the long term lead to diseases.

Examples of bad combinations:

Combinations of starchy foods (cereals and derived products, potatoes, pumpkins, chestnuts etc.) and protein-rich foods (cheeses and other dairy products, eggs, meat, nuts). PTYALIN, a basic salivary enzyme, metabolises the starches in cereals, and this continues in the stomach if the pH is not too low. The digestion of proteins begins in the stomach, which secretes a proteolytic enzyme (pepsinogen) that is activated and transformed into pepsin by hydrochloric acid. The digestion of proteins thus requires an acidic environment, while the digestion of starches requires a neutral or alkaline environment. If starches and proteins are present in the stomach at the same time, ptyalin is inactivated by the low pH, and the undigested starches will absorb the hydrochloric acid, thereby inhibiting the digestion of the proteins, causing fermentation and putrefaction. Combinations of different protein-rich foods (meat and eggs, eggs and cheese, meat and cheese, etc.). Each type of

dietary protein requires a particular gastric juice, which is secreted at a different time and has a different ideal acidity with respect to the others. Therefore meals work best if they contain a single type of protein. Fruit, sugar and sweets consumed at the end of the meal. If eaten on their own, not at meal times and well chewed, they pass straight through the stomach into the intestine, where they are rapidly absorbed. If in contrast they are eaten at the end of a meal they will necessarily follow the same digestive process as the other foods: in practice they remain for hours in the warm and wet environment of the stomach, where they inevitably ferment.

The aim of this scientific study is (i) to demonstrate that our dietary protocol developed by us, called the “traditional Mediterranean diet with correct nutritional associations” is compatible with ketogenic therapy and does not entail weight gain, thanks to the inclusion of cereals with the consequent reintroduction of muscular glycogen and (ii) as mentioned above, to monitor changes in body composition during both ketogenic therapy and the “traditional Mediterranean diet with correct nutritional associations”.

Materials and methods

Protocol for the TMDCNA (traditional Mediterranean diet with correct nutritional associations).

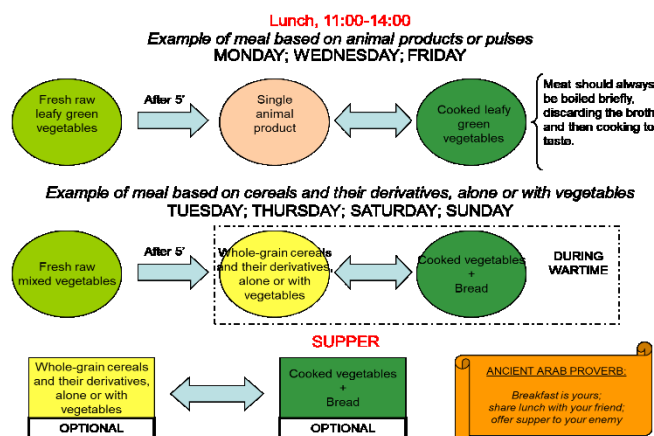


Figure 1. TMDCNA Scheme (traditional mediterranean diet with correct nutritional associations)

Breakfast

- INFUSION OF BARLEY or BANCHA TEA or KUKICHA TEA or RICE-, ALMOND- OR OAT-BASED MILK (without added sugar)
- 10-15 g of RAW CANE SUGAR (e.g. PANELA) +
- 50 g of BRAN-BASED CEREAL (wholemeal flakes of rice and maize
- or 3-4 SLICES OF WHOLEMEAL RUSK with a thin layer of organic jam without added sugar or hazelnut spread
- Or 5-6 DRY BISCUITS made with wholemeal flour and raw cane sugar
- 2-3 PIECES OF FRUIT (in season, of a single type, not very ripe and peeled). Alternatively, associate them in the following way:
 - SWEET FRUIT: bananas, dates, figs, black cherries, grapes, persimmons...
 - SEMI-ACIDIC FRUITS: apples, pears, strawberries, grapes, red cherries, peaches, plums, apricots, blackberries, mangoes...
 - ACIDIC FRUITS: lemons, citrons, grapefruits, oranges, mandarins, blackcurrants, pomegranates, kiwis... We may also include here fresh fruit juice, made from seasonal fruit without added sugar or preservatives.

Lunch

animal products:

- fish (red mullet, sea bream, sardine, amberjack, anchovy, monkfish, bonito, mackerel, clam, flatfish, octopus, cuttlefish, cod, tuna, salmon, swordfish, etc.) cooked to taste but not fried.
- meat (chicken, turkey, rabbit. For people in group 0, also beef and veal).

whole-grain cereals and their wholemeal derivatives:

- quinoa with vegetables (e.g. creamed artichokes, creamed pumpkin, with mixed vegetables etc.).
- brown rice or buckwheat in salads (with extra-virgin olive oil, tinned maize, tomatoes and vegetables in oil such as aubergines, mushrooms, artichokes, etc. never use vegetables conserved in vinegar).
- brown rice in risottos (e. g. with radicchio, pumpkin, asparagus etc., to be served without butter or parmesan cheese, but with a sprinkling of goat's cheese).

- wholemeal bread, naturally leavened, with cooked vegetables (escarole, broccoli, artichokes, spinach, etc.) fried in con 20 g of extra-virgin olive oil, or with vegetables conserved in oil (carefully drained). never use vegetables conserved in vinegar.
- pasta made from stone-ground durum wheat, served either with tomato or with other vegetable-based sauces.
- wholemeal pizza, 3-4 slices (“napoli” or with vegetables, without mozzarella. better wholemeal and naturally leavened).
- gluten-free cereals (amaranth, buckwheat, maize, millet, manioc, teff, quinoa, sorghum and wild or wholemeal rice), with vegetable-based sauces.
- whole-grain cereals (amaranth, oats, farro, wheat, buckwheat, kamut, maize, millet, barley, quinoa, rye and wild or wholemeal rice), with vegetable-based sauces.

dinner

- wholemeal rice (e. g. risotto with radicchio, artichokes, asparagus, etc., to be served without butter or parmesan cheese, but with a sprinkling of goat’s cheese.
- wholemeal polenta made from maize or buckwheat.
- cous-cous with vegetables.
- millet cake (mix some boiled millet with previously fried carrots and onions and bake in the oven).
- brown rice in a salad (with extra-virgin olive oil, tinned maize, tomatoes and vegetables in oil such as aubergines, mushrooms, artichokes, etc. never use vegetables conserved in vinegar).
- quinoa with vegetables (e. g. with creamed artichokes, creamed broccoli, mixed vegetables etc.).
- gluten-free biscuits with fresh or dried tomatoes and vegetables in oil or cooked vegetables.
- minestrone with vegetables or vegetable broth (no stock cube), with whole-grain cereals

(amaranth, oats, buckwheat, maize, millet, quinoa, sorghum and wild or wholemeal rice).

- pasta made from farro or buckwheat with vegetables.
- boiled or roast potatoes.
- pasta made from stone-ground durum wheat with vegetable-based sauces or lightly fried tomatoes.
- pizza, 3-4 slices (“napoli” or with vegetables, without mozzarella. better wholemeal and naturally leavened).
- wholemeal bread roll, emptied out and filled with cooked vegetables (escarole, broccoli, pumpkin, spinach etc.) or with vegetables in oil (carefully drained). never use vegetables preserved in vinegar.
- 2-3 wholemeal “frise” with fresh or dried tomatoes and vegetables in oil or cooked vegetables.
- wheat biscuits with fresh or dried tomatoes and vegetables in oil or cooked vegetables.
- minestrone with vegetables or vegetable broth (no stock cube), with whole-grain cereals (amaranth, oats, farro, wheat, buckwheat, kamut, maize, millet, barley, quinoa, rye and wild or wholemeal rice).

Fresh raw leafy green vegetables

Before the whole-grain cereals or their wholemeal derivatives: Carrots or fennel (never dressed with lemon juice or vinegar);

Before animal products: lettuce, escarole, radicchio etc. (never starchy vegetables such as carrots or fennel).

Cooked vegetables

Always use vegetables in season, preferably the produce of biodynamic agriculture.

note:

- do not eat starchy vegetables (aubergines, courgettes, peppers, potatoes) with animal products;
- when associated with animal products, tomatoes should be properly cooked; when associated with cereals, they should be raw or lightly fried.

Snack

- fresh fruit or nuts

Results and Discussion

The patient in this study is a Caucasian female, 167 cm tall, with an initial weight of 104 kg with a BMI of 37.3 Kg/m².

In the first phase (figure 2), in which the patient underwent integrated ketogenic therapy, with two liquid meals (shakes prepared with whey protein) and one solid meal, followed by what we called the “transitional diet”, in which the meals were always rich in protein, but only breakfast was liquid. The patient experienced a weight loss of 11 Kg. In terms of body composition, this entailed a loss of 7.7 kg in fatty tissue (FM) and an increase of 0.3 Kg in cellular mass (BCM).

In the second phase (figure 2), in which the patient followed the “traditional Mediterranean diet with correct nutritional associations”, we note that the weight loss did not stop but continued. The patient lost a further 4 kg, composed mainly of fat (FM, -1.5 Kg) and cellular mass (BCM, -2.5 Kg).

N.B. the protocol was not integrated with plant or whey protein, since the patient complained of excessive muscle mass around the thighs, which she saw as unattractive.

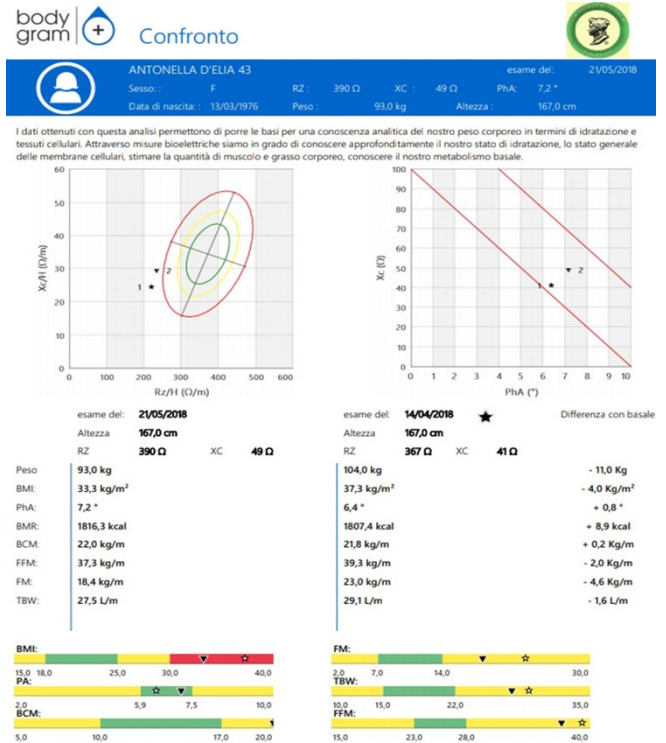


Figure 2. Test of impedance and relative bia/biva analysis, showing the difference between the situation before treatment and after consuming a ketogenic diet for 21 days and then a transitional diet for 15 days.

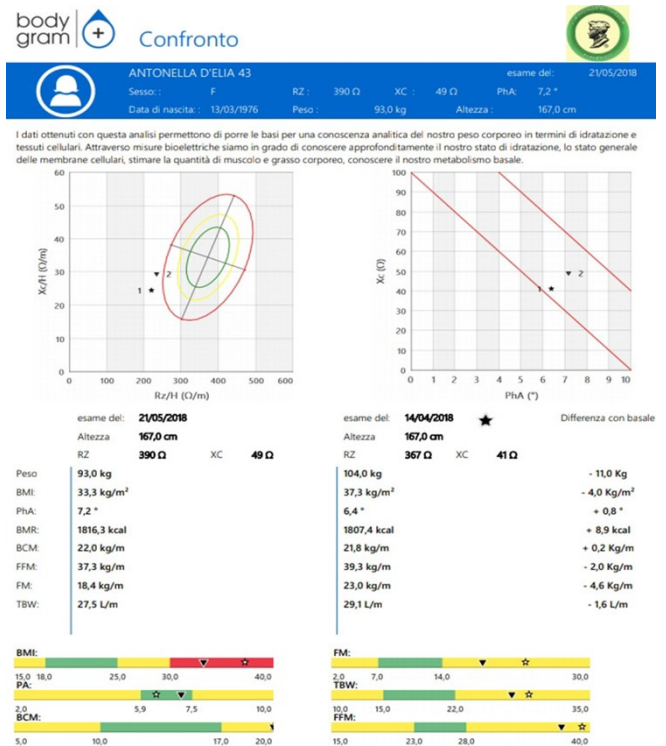


Figure 3. Test of impedance and relative bio/biva analysis, showing the difference between the situation before treatment and after consuming the “traditional mediterranean diet with correct nutritional associations.

Conclusion

In conclusion, we can say that our study confirms the beneficial interaction, in terms of weight loss, of cyclical ketogenic therapy and long-term adherence to the traditional Mediterranean diet with correct nutritional associations. Further studies are necessary however, possibly based on a broader sample of patients and possibly including a high-protein breakfast associated with physical exercise in order to minimise the loss of muscle ma

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