

Scientific Exercises and Right Diet-The Consummate Combination for an Incontrovertible Metabolism

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Received Date: 04 January 2023; **Accepted Date:** 10 January 2023; **Published date:** 15 January 2023

Citation: J.C Balachandar, S. Irshad Ahamed and M. Jayachandran. (2023). Scientific Exercises and Right Diet- The Consummate Combination for an Incontrovertible Metabolism. *Journals of Endocrine System and Diabetes*.2(2). DOI: 10.58489/2836-502X/008.

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Abstract

Our metabolism is the process our body uses to convert energy from food for all its functions. We rely on our metabolism to breathe, think, digest, circulate blood, keep warm in the cold, and stay cool in the heat. The incidence of several cardiometabolic diseases (e.g., obesity, metabolic syndrome or type II diabetes mellitus) is rapidly increasing worldwide during the last decades accounting for important healthcare costs & human suffering. Scientific exercise and diet are well-recognized factors that influence energy metabolism (including energy balance or nutrients oxidation, among others) in both healthy individuals and patients. Indeed, they improve metabolic flexibility which is defined as the ability of an individual to respond or adapt according to changes in metabolic or energy demand as well as the prevailing conditions or activity. Metabolism is inherited from your genes. Since you cannot change your genes, it is good to focus on your habits by making lifestyle changes backed by scientific exercises and right diet to increase your metabolism.

Keywords: Metabolism, Scientific exercises, Oxidation, Right diet and metabolic syndrome

Introduction

The effects of exercise on AT (Adipose Tissue) are associated with significant changes in metabolism and composition of fatty acids (FAs), the main components of adipocytes. Aside from the storage of triacylglycerols, AT acts also as an endocrine organ, releasing many biologically active substances referred to as adipokines. Exercise may also modulate the endocrine function of AT [1]. Exercise has these powerful effects on metabolism, not only because of its well-known effects on skeletal muscle metabolism, but also as a result of the metabolic adaptations it confers in multiple other tissues [2]. Finally, insulin resistance plays a important role in reduced metabolic flexibility which is defined as the capacity to switch between metabolic substrates depending on which is most readily available [3]. Individuals maintain a long-term habit of moderate

volume but vigorous running have a significantly reduced risk for obesity and type 2 diabetes [4]. Although some studies suggested a greater effect of exercise on visceral than subcutaneous adipose tissue mass, potentially because visceral adipose tissue mass is more responsive to adrenergic activation [5].

The microvasculature of human skeletal muscles has a complex 3D structure and is subject to a large number of complementary blood-flow regulation mechanism, but the exact cascade of events and regulatory processes remain unknown, especially in humans [6]. Building positive health behaviors and maintaining psychological well-being are foundational for achieving diabetes treatment goals and maximizing quality of life [7]. An individual's engagement in self-management behaviors and the effects on clinical outcomes, health status, and quality

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of life, as well as the psychosocial factors impacting the person's ability to self-manage, should be monitored as part of routine clinical care. A randomized controlled trial (RCT) testing a decision-making education and skill-building program [8]. Continuous glucose monitoring, when combined with individualized diabetes education or behavioral interventions, has demonstrated greater improvement on glycemic and psychosocial outcomes compared with continuous glucose monitoring alone [9].

For many individuals with diabetes, the most challenging part of the treatment plan is determining what to eat. Nutrition therapy plays an integral role in overall diabetes management, and each person with diabetes should be actively engaged in education, self-management, and treatment planning with the health care team, including the collaborative development of an individualized eating plan [10]. While there is likely no harm in consuming moderate amounts of foods and beverages that are purported to improve metabolism such as spicy foods, ginger and green tea this is unlikely to have a significant effect on energy expenditure or body weight [11].

We have found that persistent disturbance of nutrient metabolism and/or energy homeostasis, caused by either nutrient deficiency or excess, induces cellular stress leading to metabolic dysregulation and tissue damage, and eventually to development of acquired metabolic syndromes [12].

Discussion

Effect of scientific exercise on metabolism

When it comes to boosting your metabolism, exercise is your best bet. According to a new study, exercise is incredibly effective in converting food into energy and burning fat. Researchers measured about 200 metabolites, the substances produced during metabolic processes, which signal how the metabolism responds to exercise in the blood of 52 young male soldiers before and after an intensive 80-day strength and aerobic training program. The study found dramatic changes in many metabolites. These changes indicate that consistent exercise caused the muscles to use far more fuel predominantly fat than previously thought. Ketone bodies which are compounds produced when fats are metabolized and fatty acids like saturated and unsaturated fats were dramatically decreased in circulation, as a result of more uptake into the muscles. This helps the body use the protein more effectively, and that leads to better vascular function and fat loss over time based on enhanced metabolism [13].

Intensive scientific exercise boosts communication between skeletal muscles and fat tissue, fine-tuning metabolism and improving performance, research in mice and humans suggests. The finding may lead to new treatments for metabolic diseases associated with aging and obesity and prove the importance of exercise in improving the metabolism. Researchers in Brazil have discovered that aerobic exercise triggers the release of signaling molecules into the bloodstream that free up more energy for use by the muscles. Previous research has found that aging and obesity impair the production of these signaling molecules, known as microRNAs. This increases the likelihood of metabolic diseases, such as diabetes and dyslipidemia. The good news is that exercise may help ward off these conditions by stepping up the production of certain microRNAs through improving your metabolism [14].

Some metabolic boosting exercises

Cardiovascular exercise (running, swimming, aerobics, walking) stimulates your metabolism, helps you burn calories and can even temporarily suppress your appetite post-workout. But don't let cardio get all the metabolic-boosting glory. Weight training/muscle training is important too, because it tones your muscles and boosts lean tissue mass, which burns more calories per pound than fat. The leaner muscle tissue you have, the more calories you burn daily. The more muscle mass you have, the more metabolic benefits you enjoy [15].

Effect of right diet on Metabolism

Nutrients serve as the building blocks for the hormones that regulate metabolism. If you have a well-balanced diet, you're getting the nutrients you need and in the right quantities then your metabolism will most likely function properly. However, say you're eating lots of foods that are high in sugar, then this excess sugar will disrupt your metabolism and put you at risk of developing metabolic diseases. High fibre foods, proteins and iodine-rich foods are some of the thermic foods that support a healthy metabolism. Protein-rich foods like meat, fish, eggs, dairy, legumes, nuts, and seeds could help increase your metabolism for a few hours because they require your body to use more energy to digest them. The minerals iron and selenium are required for the optimum functioning of your thyroid gland, which regulates your metabolism. Include selenium- and iron-rich foods like meat, seafood, legumes, nuts, and seeds in your daily diet. As mentioned before, eating these foods in the right quantity is equally important for good metabolic health. Evidence from animal

research and a few studies in humans suggests that tightly restricting calorie intake, for example, through right diet and intermittent fasting may help stave off conditions associated with aging, such as diabetes and heart disease. In muscle cells, a molecular sensor called AMPK is activated when the cells consume large amounts of ATP, which is the fuel that powers all the cellular activities. AMPK activation is known to play a role in increasing the metabolic benefits of both caloric restriction and aerobic exercise [16].

Some metabolic boosting foods

(a) Egg Whites:

For a perfect start to the day, have an egg white omelet for breakfast. Nutritionists say that egg whites are packed with branched-chain amino acids, which keep your metabolism on fire through the day.

(b) Hot Peppers:

Eating spicy foods may prevent overeating. But there's another reason to add hot peppers or jalapenos to your food. They contain a chemical called capsaicin which boosts metabolism. Capsaicin makes your hormones alert, increases your heart rate and prompts your body to burn calories faster. Nutritionists recommend adding a tablespoon of chopped chili peppers to your meal daily [17].

(c) Green Tea:

Three to five cups of green tea a day can help keep fat away. This beverage contains bioactive substances like caffeine and epigallocatechingallate (or EGCG), which have been proven to substantially increase metabolic rate. Research reveals that green tea increases your metabolism by four percent over 24 hours and makes you burn an extra 70 calories. This means one would lose roughly 3 kilos a year or 30 kilos in 10 years. So try a teatox today.

(d) Milk & Yogurt:

Drink a glassful of milk – full of calcium – every day. Research at the University of Tennessee has found that daily calcium intake helps the body metabolise fat efficiently. Yogurt or curd also contains probiotics, the good bacteria which help in digestion [18].

(e) Cinnamon:

Cinnamon not only adds a sweet-nutty flavor to your cake or pulao, it also boosts metabolism. The spice, which can clear your arteries and fight ageing, has thermogenic properties, which means it raises your body's temperature and prompts it to start burning calories. It is advisable to consume about 1/4th teaspoon of cinnamon powder per day. It will also

help reduce your sweet cravings and improve your metabolism.

(f) Dark Chocolate:

A piece of dark chocolate daily is a perfect pick-up for your mood and your metabolism. Dark chocolate is packed with monounsaturated fatty acids or MUFAs, which help increase metabolic rate so you burn calories faster. A study performed at Queen Margaret University, UK, showed that these sweet impacts the way our body synthesizes fatty acids and therefore reduces the absorption of fats and carbohydrates. Cacao (which is in abundance in dark chocolate) is also packed with magnesium, which stimulates fat-burning hormone adiponectin and improves metabolism [19].

(g) Lentils:

Many dieters skip the katori of dal, preferring to stick to green veggies. Nutritionists say this is a major blunder as lentils – be it arhar or moongdal – are loaded with iron, which is essential to keep the body in shape. Iron facilitates the flow of oxygen through the body, thereby keeping your metabolism high and increasing energy production. Relish your favouriterajma too. Beans are rich in protein and fibre, the building blocks of good metabolism [20].

(h) Water:

Last but truly not the least is water. If you are doing everything right and still not losing weight, the reason is probably dehydration. A dehydrated body never makes fat burning a priority. Increasing your fluid intake, be it coconut water or barley water, will help you feel better and also increase your metabolic rate. A study published in the Journal of Clinical Endocrinology and Metabolism found that drinking water increases metabolic rate by 30 percent. You don't have to aim for the 8-glasses a day goal. Moreover, water is a natural appetite suppressant so make it your best buddy for weight loss and good metabolism [21].

The importance of the entire diet that is consumed as a regular practice is being recognized, and an increasing number of studies are analyzing dietary pattern to identify possible causes of under- and over-nutrition. By definition, dietary pattern characterizes the overall diet by the quantities, the proportion, and the variety of foods and beverage as well as the frequency of consumption [22].

Conclusion

Metabolism refers to biochemical processes that occur within any living organism including humans to maintain life. These biochemical processes plays a

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key role and allow people to grow, reproduce, repair damage, and respond to their environment, and this can be nicely managed through your lifestyle backed by scientific exercises and right diet. Regular scientific exercises stimulate lipolysis, decreases fatty acid uptake by the adipocytes, exerts an effect on fatty acid composition within the adipose tissue or fat and modulates the expression of enzymes involved in fatty acid synthesis, elongation and desaturation. Moreover, exercise promotes “beiging” of adipose tissue and contributes to an increase in mitochondrial activity, which leads to enhanced fatty acid oxidation in the adipose tissue. As a result of all those metabolic processes, physically active persons can maintain adequate volume of adipose tissue. Chronic exercise influences the release of adipokines, which may attenuate systemic inflammation and prevent insulin resistance. Taken altogether, these findings imply that the exercise-induced changes in AT metabolism may exert a beneficial effect on global metabolic health or improves your metabolism and helps the mankind to stay away from diseases. Eating less can slow down your metabolism. On the other hand, eating more frequently (multiple meals) filled with right nutrition, especially focusing on certain foods can help you achieve a higher metabolic rate. This improves your body’s fat-burning capacity and helps you attain a dream metabolism. Right diet loaded with right nutrients have been commonly regarded as nourishment, providing raw materials needed for the cells growth and proliferation, and fuel for powering cellular and over all metabolism.

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