

Benefits and Risks of Ketone Bodies



Libyan International Medical University
Faculty of Basic Medical Science
Miftah Alagorey. 2nd Year Medical Student.

Introduction

- **ketone bodies** are one of the products of fat burning in the body. When there is not enough insulin, your body is unable to use sugar (**glucose**) for energy and your body breaks down its own fat. Into fatty acids and then to ketone bodies in the liver : acetone ,acetoacetate ,Beta-hydroxy butyric acid , then extra hepatic tissue break them down for energy (Fig.1)
- ketone bodies are better than glucose for energy , because its clean fuel for the body and have a lot of benefits . But also they have some risks also (greater than 2 years). [1]

Benefits

- Glucose control improves due to less glucose introduction and improved insulin sensitivity. In addition to reducing weight, low-carb diets also may help improve blood pressure, blood glucose regulation, triglycerides, and HDL cholesterol levels.
- in various studies, the ketogenic diet has shown promising results in a variety of neurological disorders, like epilepsy, dementia, traumatic brain injury, acne, cancers, and metabolic disorders.[2]
- Ketone bodies as a therapeutic for Alzheimer's disease. [3]

Risks

- The most common and relatively minor short-term side effects of ketogenic diet include a collection of symptoms like nausea, vomiting, headache, fatigue, dizziness, insomnia, difficulty in exercise tolerance, and constipation, sometimes referred to as keto flu. These symptoms resolve in a few days to few weeks.
- Long-term adverse effects include hypoproteinemia, kidney stones, and vitamin and mineral deficiencies [2]
- Hyperketonemia can increase lipid peroxidation and lower glutathione levels in human erythrocytes in vitro and in type 1 diabetic patients [4]
- Hyperketonemia increases monocyte adhesion to endothelial cells. [5]
- Ketosis (acetoacetate) can generate oxygen radicals and cause increased lipid peroxidation and growth inhibition in human endothelial cells. [6]

Conclusion

- low-carbohydrate diets led to significantly greater weight loss compared to low-fat interventions. It was observed that a carbohydrate-restricted diet is better than a low-fat diet for retaining an individual's **Basal metabolic rate (BMR)**. In other words, the quality of calories consumed may affect the number of calories burned. BMR dropped by more than 400 kcal/day on a low-fat diet when compared to a very low-carb diet.[2]

References

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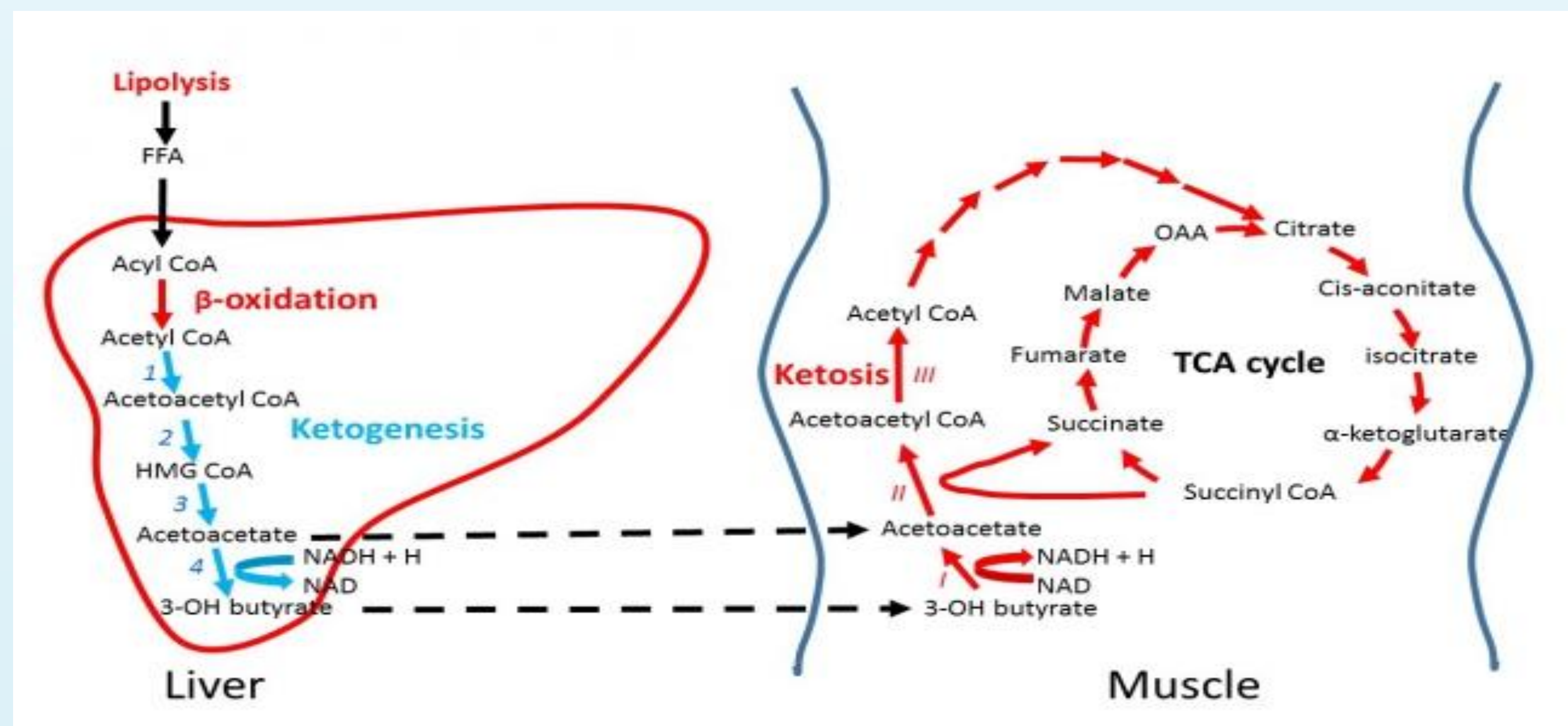


Figure 1 Ketone body synthesis in the liver and use in peripheral tissues.