

Triheptanoin for the treatment of LC-FAOD: a cohort study

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INTRODUCTION

Long-chain fatty acid oxidation disorder (LC-FAOD) is a group of rare disorders associated with high morbidity and mortality. Treatment involves avoidance of fasting and a long-chain fatty acid-restricted diet, along with supplementation of other sources of energy. Triheptanoin has emerged as a new treatment option, offering a source of calories and anaplerotic fatty acids (Figure 1).

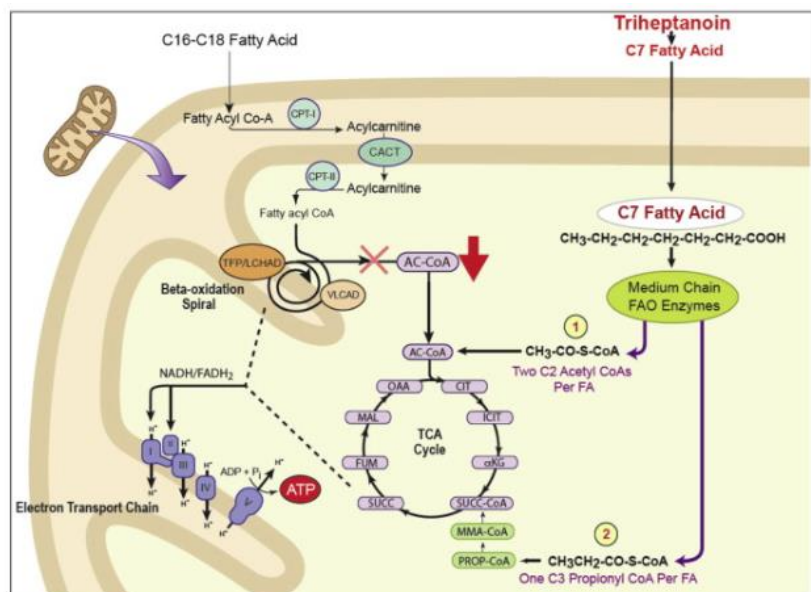


Figure 1. Anaplerotic effect of triheptanoin.

Source: Vockley J, et al. Long-term major clinical outcomes in patients with long chain fatty acid oxidation disorders before and after transition to triheptanoin treatment– A retrospective chart review. Mol Genet Metab. 2015 Nov;116(3):221.

OBJECTIVES

To characterize a cohort of Brazilian LC-FAOD patients treated with Triheptanoin.

METHODOLOGY

A multicenter, retrospective study. All included patients had the diagnosis of LC-FAOD confirmed by biochemical/genetic testing and are on triheptanoin for at least 3mo. Data were collected through a specific form developed for this research, including quantitative and qualitative questions. 'Pre' treatment period was defined as up to one year before treatment initiation and 'post' as up to two years after.

RESULTS

Sixteen patients (female= 12; children= 10, adolescents= 3, adults= 2, <1 year= 1) were included. They came from 8 Brazilian metabolic centers. Diagnosis occurred at a median age of 6 months (0-744), with two cases being identified through newborn screening. Ten were switched from MCT to triheptanoin. At inclusion, the median treatment time with triheptanoin was 17 months (range: 4-52). The mean triheptanoin dose was 36.0 ± 15.4 mL/day. The number of hospitalizations significantly decreased after initiating treatment [pretreatment median=1 (0–12), post treatment median=0 (0–2), $p=0.0039$]. Adverse events occurred in 9/16 patients (Fig. 2). One patient had to be admitted due to ileitis and rhabdomyolysis, improving with antibiotic therapy and maintenance of triheptanoin. Triheptanoin has not been discontinued in any patient.

Qualitative questions:

The main reasons reported by physicians for prescribing triheptanoin were: 1) to prevent serious complications such as metabolic decompensation, need for hospitalization ($n= 11$); 2) to improve symptoms such as fatigue, muscle pain and exercise intolerance ($n= 5$); and 3) to improve cardiac function in patients with cardiomyopathy ($n= 3$). The main benefits after initiating treatment included: 1) increased energy and physical capacity, with frequent reports of 'improved overall well-being' ($n= 6$) ; 2) reduction in acute complications, such as a significant decrease in hospitalizations ($n= 12$); and 3) improvements in neurological and cardiac outcomes ($n= 4$).

CONCLUSION AND DISCUSSION

Triheptanoin demonstrates significant therapeutic potential in reducing acute complications, particularly hospitalizations. The health teams that follow the patients refer an associated improvement of functional outcomes (physical capacity and overall well-being). However, variability in individual responses, especially during early treatment phases, highlights the need for tailored patient monitoring and further long-term studies to optimize dosing protocols and validate these findings.