Fatigue onset through oxidative stress, dehydration and lactic acid accumulation and its in vivo study using experimental animals

ABSTRACT

Among athletes, endurance is one of the key elements to victory. In addition to training, athletes normally used supplement to prevent fatigue during the event. With prolonged and intense activity, our body started to experience decrease in muscle performance due to several factors such as oxidative stress, dehydration and accumulation of lactic acid in the body fluids. The free radicals generated during intense exercise will expose the cells to oxidative damages. In the event of dehydration, there will be significant losses of water and functional electrolytes during intense exercise which affected the body fluid balance. Fatigue will also occur during reduced oxygen in aerobic metabolism which later caused accumulation of lactic acid in the muscle. This will change the pH balance toward more acidic and caused the muscles to lose contractile efficiency. In addition, fatigue can also be studied using rats as model organism. Results from this activity can be useful to analyse cellular metabolism and physiology effects of the tested rats toward physical exercise. Therefore, this review aims to discuss the causes of fatigue through oxidative stress, dehydration and lactic acid accumulation. In addition, the effectiveness of using rats as a model system in measuring fatigue is also included in illustrating examples on fatigue assessment in vivo.

Keyword: Exercise; Fatigue; Oxidative stress; Hydration; Lactic acid