Defects in resting metabolic rates and mitochondrial respiration in Kwashiorkor and dietary obese rats

Abstract:

Resting metabolic rates have been measured and compared with hepatic mitochondrial respiration in Kwashiorkor and diet-induced obese weaned rats. In Kwashiorkor, resting metabolic rate was 21% lower than the value of controls, while that of the obese rats was 14% higher than in control animals. The resting metabolic rate for Kwashiorkor animals was 50% of the predicted basal metabolic rate (BMR), whereas that of the obese rats was 23% higher than the predicted BMR. The mitochondrial oxygen consumption patterns, using malate plus glutamate or succinate as respiratory substrates, revealed that the resting respiration (state 4) was 23.9% higher in Kwashiorkor and 29.1% higher in obese animals, while the active (state 3) respiration was 34.8% lower in Kwashiorkor and 43.3% lower in obese rats compared to controls. The respiratory control ratios (RCR) were 51.1% and 43.8% in Kwashiorkor and obese rats, respectively, relative to the values in control rats. It is concluded from these studies that Kwashiorkor disease and diet-induced obesity appear to interfere with oxygen utilization at the level of state 3 mitochondrial respiration, which is markedly decreased when compared to the values for control animals.