

Abstract

Obesity is associated with metabolic complications including insulin resistance, dyslipidemia and hypertension (metabolic syndrome). The endocannabinoid system (ECS) activity is elevated in obesity, which can further potentiate metabolic impairments. Pharmacological treatment based on the cannabinoid receptor CB1 blockade led to a decrease in body weight and significant improvements of metabolic parameters in obese individuals. However, parallel effects on the central nervous system resulted in unwanted side-effects including anxiety and depressive moods. Recent experimental studies suggested that dietary interventions with omega-3 polyunsaturated fatty acids of marine origin (EPA, DHA) can decrease the ECS activity in peripheral tissues (adipose, liver, pancreas), and thus partially protect against metabolic disturbances in obesity. One of the underlying mechanisms behind the effects of EPA and DHA could be a replacement of arachidonic acid from the sn-2 position of membrane phospholipids, thereby reducing the substrate availability for the synthesis of endocannabinoid molecules.

Key words:

omega-3 fatty acids, obesity, endocannabinoid system, 2-arachidonoylglycerol, anandamide