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Circulating endocannabinoids and N-acyl ethanolamines are differentially regulated in major depression and following exposure to social stress.

Hill MN[1], Miller GE, Carrier EJ, Gorzalka BB, Hillard CJ.

Author information

Abstract

Central endocannabinoid signaling is known to be responsive to stressful stimuli; however, there is no research to date characterizing the effects of stress on peripheral endocannabinoid content. The current study examined serum content of the endocannabinoid ligands N-arachidonylethanolamide (anandamide; AEA) and 2-arachidonoylglycerol (2-AG), and the non-cannabinoid N-acyl ethanolamine (NAE) molecules palmitoylethanolamide (PEA) and oleoylethanolamide (OEA) under basal conditions, immediately following the Trier Social Stress Test (TSST), and 30 min thereafter, in 15 medication-free women diagnosed with major depression, and 15 healthy matched controls. Basal serum concentrations of AEA and 2-AG, but not PEA or OEA, were significantly reduced in women with major depression relative to matched controls, indicating a deficit in peripheral endocannabinoid activity. Immediately following the TSST, serum 2-AG concentrations were increased compared to baseline; serum AEA concentration was unchanged at this time point. Serum concentrations of PEA and OEA were significantly lower than baseline 30 min following the cessation of the TSST. The magnitude of these responses did not differ between depressed and control subjects. These are the first data to demonstrate that the peripheral endocannabinoid/NAE system is responsive to exposure to stress.

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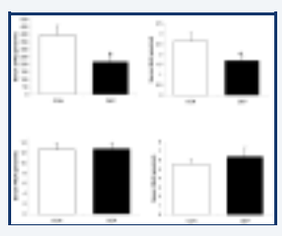

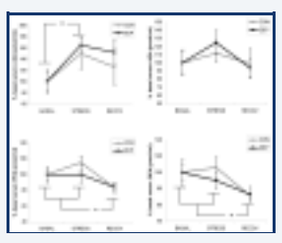

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