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DIFFERENT EXPRESSION TONES OF CENTRAL AND PERIPHERAL ENDOCANNABINOIDS LEVELS IN OVERWEIGHT AND OBESE MICE

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KEYWORDS: Endocannabinoids; overweight; obesity

INTRODUCTION

Overweight and obesity are associated with activation of the endocannabinoid system⁽¹⁾. However, it is not clear whether there is a different expression tone of the endocannabinoids (ECs) between the overweight and obese groups. We assume that endocannabinoids 2-arachidonoylglycerol (2-AG), Anandamide (AEA) and N-oleylethanolamine (OEA) levels are higher in the brain and serum of obese individuals than in overweight groups.

PURPOSE

To explore the differences of ECs levels in central and peripheral between overweight and obese mice fed on a high fat diet and to analyze the relationship between ECs and body fat ratio.

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METHODS

C57BL/6J male mice, at four weeks old, were randomly divided into control group (n=25, fed normal diet) and high fat diet group (n=205, fed D12492, 60% fat) by EXCEL random grouping table. After an 8-week of follow-up, 10 mice were randomly selected

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from the control group, and their average body weight (BW) was defined as X^(g). Then the mice fed on high fat diet were divided into two groups based on their BWs as compared to X: overweight (110-119% X) and obese (120-149% X) group. High performance liquid chromatography (HPLC) were used to detect endocannabinoids levels (including 2-AG, AEA, OEA). Body fat ratio = (Perirenal and epididymal fat mass)/BW*100%. Data were shown as mean ± standard deviation (SD) and independent t test was used to analyze ECs levels between two groups. P < 0.05 was considered to be significant.

RESULTS

1) Serum 2-AG, AEA and OEA were higher in obese group (141.55±89.90; 21.54±12.96; 63.44±42.27) than in overweight group mice (116.09±126.91; 19.72±18.96; 43.23±37.15, respectively, unit: pg/ml), although statistical significances were not reached (P>0.05, for each comparison); 2) Brain tissue AEA and OEA in obese group (0.43±0.12; 0.68±0.19) were significant higher than overweight group (0.31±0.10; 0.49±0.10; P<0.05 and P<0.01 respectively, unit: ng/mg); 3) Taken overweight and obese group as a whole (n=20), we found brain tissue OEA showed a positively relationship with BW (r=0.376, P<0.05) and body fat ratio (r=0.427, P<0.05).

CONCLUSION

Central and peripheral ECs show a rising trend as body weight gains and OEA may be more relevant to the increase in fat mass.

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