Entrega de l'Abstract

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Títol de la recerca: Modulation of the endocannabinoid system in executive functions in extreme weight conditions: from Anorexia nervosa to Obesity

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Abstract:

***Background*:** Extreme weight conditions (EWC) along a continuum may share some biological risk factors and intermediate neurocognitive phenotypes. A core cognitive trait in EWC appears to be executive dysfunction, with a focus on decision making, response inhibition and cognitive flexibility. Some biological variables may interact with cognitive alterations in EWC cognitive profile. There is a deal evidence supporting the involvement of endocannabinoid system in appetitive processes and it would be also involved in the dysfuctional profile of EWC. The aim of the study was to investigate the correlation between plasma levels of different endocannabinoids [namely, anandamide (AEA), 2-arachinodoylglycerol (2-AG), 2-linoleoyl glycerol (2-LG), 2-oleoyl glycerol (2-OG), palmitoyl ethanolamide (PEA), palmitoleoyl ethanolamide (POEA), stearoyl ethanolamide (SEA), oleoyl ethanolamide (OEA), linoleoyl ethanolamide (LEA), di-homo-gamma-linoleoyl ethanolamide (DGLEA), docosatetraenoyl ethanolamide (DEA) and docosahexaenoyl ethanolamide (DHEA)] and cognitive functions [such as decision making (Iowa Gambling Task-IGT), inhibition response (Stroop Color and Word Test-SCWT) and cognitive flexibility performance (Wisconsin Card Sorting Test-WCST)] as a potential mechanism of modulation of executive functions profile in EWC.

Methods: 188 subjects (29 anorexic patients, 62 obese subjects and 97 healthy controls) were assessed using the WCST, SCWT and IGT. All participants were female, aged between

18 and 60 years and spoke Spanish as their first language. We also measured plasma levels of 2-AG, AEA, 2-LG, 2-OG, PEA, POEA, SEA, DGLEA, OEA, LEA, DEA, DHEA. Samples were collected in all subjects between 8 and 9 am, after a fasting period of at least 12 hours duration.

Results: A negative correlation was found between DHEA and response inhibition (r=-.147). A correlation was found between 2-OG, 2-LG and SEA and cognitive flexibility performance. Specifically, there was a significant inverse correlation between both WCST conceptual response and WCST total categories completed and 2-OG (r=-.245; r=-.244), 2-LG (r=-.158; r=-.172) and SEA (r=-.321; r=-.287). A negative correlation was also found between WCST correct response and both SEA (r=-.262) and 2-OG (r=-.162) and a positive correlation between WCST total errors and both 2-OG (r=.216) and SEA (r=.309). A positive correlation was found between SEA and WCST number of trials (r=.222), and WCST trials to complete first category (r=.256). Finally a negative correlation was found between decision making and 2-AG (r=-.242), 2-OG (r=-.249), 2-LG (r=-.210) and SEA (r=-.158). Of Interest, we did not find any significant correlation between AEA concentrations and cognitive outcomes. Following a multiple regression model valuing the specific contribution of endocannabinoids on executive functions was performed (significant results $p<.05$). DGLE showed a positive modulation on cognitive flexibility. Conversely, SEA negatively modulates the cognitive flexibility and decision making performances. Finally, 2-AG also showed a negative modulation on decision making.

Conclusions: These results show a relevant modulation of the endocannabinoid system on prefrontal-dependent cognitive functioning. The present study might have significant implications for the underlying executive alterations described in some disorders currently associated with endocannabinoids deregulation (namely obesity and eating disorders). Understanding the neurobiology of their dysexecutive profile might certainly contribute to the development of new targets for pharmacological treatments.

Contribució personal: En aquest treball de recerca he contribuït analitzant els resultats estadístics i en la redacció del mateix. A més, també he participat en la correcció de diferents proves neuropsicològiques com per exemple, l'STROOP.