Activity-Based Anorexia in Adolescence and its Effects on Depression in Adulthood
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Introduction
During adolescence, different brain systems develop at different rates, which may contribute to an increased vulnerability to emotional and behavioral problems. Both affective (i.e., anxiety, depression) & eating disorders (i.e., Anorexia Nervosa) often arise in adolescence, & are often comorbid. Activity-based anorexia (ABA) is a model in which rats are food-restricted, but given ad lib access to a running wheel. Adolescents exposed to ABA show increased anxiety-like behavior in adulthood. An increased vulnerability to emotional and eating disorders (i.e. Anorexia Nervosa) often arises in adolescence, & are often comorbid, and are often comorbid.

Methods
Subjects
• N = 31 female Long-Evans rats
  Wheel/Food-Restricted (ABA)
  Wheel/Ad Lib (Wheel/Ad Lib)
  Sedentary/Pair-fed (PF)
  Sedentary/Time-Restricted (Sed/Res)
  Sedentary/Ad Lib (Sed/Ad Lib)

Assays
• Depressive Behavioral Test
  • Porsolt Forced Swim Test (FST)
  • Conducted from P 80-82
  • Time (s) until rat became passive (immobile) was measured
  • Rats exposed to 15 min. pre-test, followed 24 hrs later by 5 min recorded test
  • Neural activation of the c-Fos protein
  • Central Nucleus of the Amygdala

Statistics
• Behavioral
  • t Test (Figs. 1-3); ABA vs. WAL
  • One-Way ANOVA (Fig. 4)
• Physiological
  • t Test (Fig. 5); ABA vs. WAL

Results
Behavioral
Change in Body Weight
Food Intake
Distance Traveled
Forced Swim Test

Physiological
cFOS Activation
Average Cell Count, CeA
Average Density, CeA

中央核的激活

ABA
Wheel/Ad Lib

Discussion
As predicted, rats in the ABA condition reached immobility significantly sooner as compared to any other group, indicating greater depressive behavior in these subjects.

Conclusions
• The behavioral results indicate that a significant stressor in adolescence does indeed have long-term effects on depressive behavior
• The physiological results, while not what we hypothesized, also indicate long-term changes after a stressor in adolescence.
• These results could indicate that the ABA group built up a physiological tolerance to, or were in some way better prepared to handle, a stressor in adulthood.
• Further research could investigate the serotonergic pathways involved in both eating disorders and depressive behavior, as this study looked at neural activation in general only.
• Further research could also elaborate on the contradictory nature of the physiological results.

References

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