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Understanding the Contributions of Hormonal Contraceptives and Cortisol Levels to Fear Learning in Women

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Women are twice as likely to be diagnosed with an anxiety disorder than men. Eighty-five percent of women in the US will use hormonal contraceptives at some point in their lifetime. Women who use hormonal contraceptives show heightened startle reactivity to a threatening stimulus. Previous results from our lab showed a significant increase in fear-potentiated startle (FPS) in women who were on hormonal contraceptives compared to women who were naturally cycling. These results stayed consistent throughout three acquisition trials. Others have shown that the use of OCPs (oral contraceptive pills) is related to the dysregulation of the HPA-axis and elevated circulating cortisol levels. Cortisol dysregulation is strongly associated with fear and anxiety, and individuals who have experienced stress and trauma often show dysregulation of the HPA-axis including cortisol abnormalities. The aim of the current study is to use the fear-potentiated startle (FPS) paradigm to examine the relationship among women's hormonal contraceptive use, cortisol levels, and fear learning. The FPS paradigm is well established as a noninvasive tool to measure amygdala activity and characterize biological correlates of fear learning. FPS measures startle amplitude (μV) in the presence of a reinforced conditioned stimulus (CS+) that is paired with an unconditioned stimulus (US), as well as during exposure to a non-reinforced conditioned stimulus (CS-) that is not paired with a US. In the current study, participants were divided by hormonal contraceptive use including women who were naturally cycling and women who were currently using hormonal contraceptives. Participants underwent three acquisition trials to measure their fear learning. Saliva was collected at baseline and after acquisition. Saliva samples were analyzed using ELISAs to measure cortisol levels at each time point. Data will be analyzed to determine the influence of cortisol on the established relationship between fear learning and contraceptive use. Results from this research have the potential to help identify the biological bases of pathological fear learning processes that contribute to an elevated risk of anxiety disorders in women.