Childhood Trauma and Physiological Stress Responses in Bipolar Affective Patients

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ABTRACT

We have administered the Childhood Trauma Questionnaire (CTQ) to twenty one Bipolar Patients (BP) and twenty four Control participants and measured their physiological responses in a startle protocol. We have measured the startle responses to 106 db pulse, pre pulse inhibitions (80 and 90 db pulse triggered 60 ms before a 106 db pulse), and the startle responses to a 106 db pulse occurring with a fear-potentiated visual stimulus. Our results demonstrate that BP have significantly higher responses than control subjects in the total CTQ score and the Emotional Abuse and Sexual Abuse subscales, and there are similar tendencies, though not statistically significant, for the Physical Abuse subscale. Post Hoc analysis reveal that BP type I have a significantly higher Emotional Abuse score than BP type II and Control participants, and higher Sexual Abuse and Physical Abuse scores than Control subjects. We observed a significant negative correlation between the amplitude of the startle responses to almost all of conditions with the CTQ Physical Abuse score only. These results suggest that childhood trauma is over-represented in Bipolar patients and could influence their physiological responses to a stressful stimulus.

INTRODUCTION

Stress responsivity of the CNS can be assessed by an acoustic startle protocol, where sudden loud noises activate an archaic acoustic reflex in the brainstem, causing an eye blink; the amplitude of this blink can be measured by electromyography. This reflex is potentiated by states of emotional distress, such as fear, via modulation by forebrain structures including the amygdala. The reflex also habituates to weaker pre-pulses (Pre-Pulse Inhibition effect). Studies have shown that the acoustic startle response is more pronounced in affective disorders, as well as in individuals with early childhood abuse, but no studies have examined possible interactions of these two phenomena.

OBJECTIVES

To determine whether individuals with Bipolar Affective Disorder have higher levels of childhood trauma than controls, and whether this difference may contribute to their greater response to an acoustic startle.

PROCEDURE

Twenty one SCID diagnosed bipolar patients (13 Bipolar I and 8 Bipolar II patients) and 24 control participants were tested in this protocol. All participants were screened for street drugs. Patients did not differ from Controls in terms of mean age or gender distribution. On the day of testing, the eye blinking component of the auditory startle reflex was measured using electromyography of the orbicularis oculi muscle. This experiment contains three blocs:

- In the first bloc, a sequence of thirty six 106db pulses occurred randomly, some of which are preceded by a pre-pulse starting 60 ms before the 106db pulse. The first six trails are rejected.
- In the second bloc, a sequence of seventy six 106db pulses are given. Each of these pulses is paired with a light: blue for the No Fear condition, red for the Fear condition. The participants are informed before the experiment that an electrical shock could occur when the light is red. Of course, no electrical shock is given, but this particular directive allows us to study the impact fear on the startle response.
- The third bloc is a repetition of the first bloc in order to assess habituation.

Subjects were also administered on the first day of testing the Childhood Trauma Questionnaire (CTQ), which is a self-report instrument that measures levels of trauma experienced in childhood according to five subtypes: Physical Abuse; Emotional Abuse; Sexual Abuse; Physical Neglect; Emotional Neglect.

CHILDHOOD TRAUMA AND BIPOLAR DIAGNOSIS

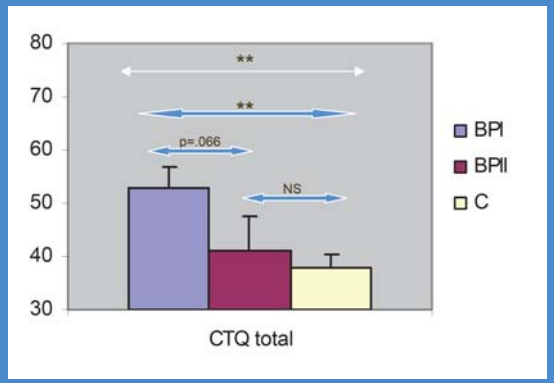

Figure 1: Rates of overall childhood trauma by status of Bipolar Disorder
** p<0.01 (two-tailed)

Bipolar I patients in our sample reported significantly higher levels of childhood trauma than Controls (p<.01), and a nearly significant trend towards higher levels of trauma than Bipolar II patients (p=.066).

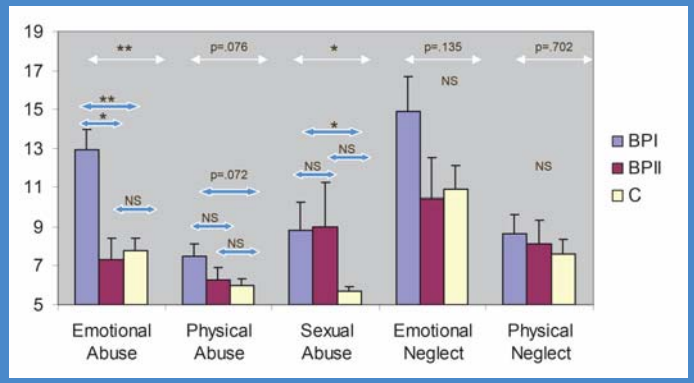

Figure 2: Rates of subtypes of childhood trauma by status of Bipolar Disorder
*p<0.05 (two-tailed) **p<0.01 (two-tailed)

In terms of the subtypes of childhood trauma reported on the CTQ, Bipolar I patients reported significantly more Emotional Abuse (p<.01) and Sexual Abuse (p<.05) than Controls, and also significantly more Emotional Abuse than Bipolar II patients (p<.05). There was also a trend indicating higher levels of reported Physical Abuse among Bipolar I patients than Controls (p=.072).

CHILDHOOD TRAUMA AND ACOUSTIC STARTLE RESPONSE

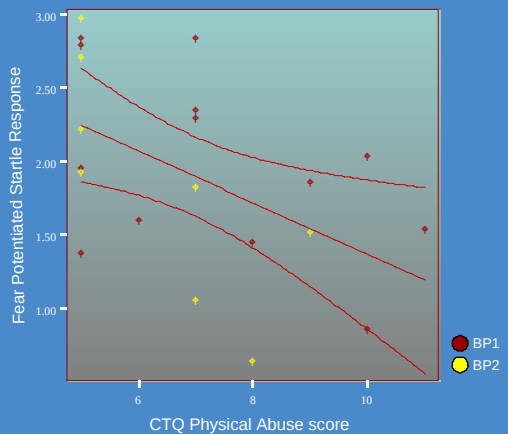

Figure 3: Pearson correlation between Fear Potentiated Startle Response and CTQ Physical Abuse score. r = -.52; p=0.02 (two-tailed), n=21 (Bipolar patients only)

Moderate correlations were found between the CTQ Physical Abuse scores in the Bipolar patients and all of the main acoustic startle response outcomes. Figure 3 shows the correlation with the fear-potentiated startle response as an example of these findings. Similar correlations were not found for the other CTQ subscores.

CONCLUSIONS

This is the first study, to our knowledge, to demonstrate a difference in levels of reported childhood abuse between patients with Bipolar I Disorder and Bipolar II Disorder or Controls. Both on overall CTQ scores, and on the Emotional Abuse and Physical Abuse subscales, Bipolar I patients reported higher levels of abuse than Bipolar II patients or Controls. This raises interesting and important questions about the possible etiology and development of Bipolar Disorder in adults, and whether experiencing trauma early in life may cause individuals who are predisposed to a Bipolar illness to manifest more severe forms of the condition in adulthood.

We also found that levels of reported childhood Physical Abuse influenced the acoustic startle response of patients with Bipolar I or II Disorder. This adds to evidence already in the literature that experiences of early childhood trauma has direct and lasting effects on the stress responsivity of the CNS, and also raised the question as to whether this may account for a possible mechanism whereby early life trauma affects the expression of psychiatric illnesses such as Bipolar Disorder.

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