BRIEF REPORTS

The Dexamethasone Suppression Test in Violent Suicide Attempters with Major Depression

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Introduction

Since the study of Bunney and Fawcett (1965) showing increased levels of 24-hour urinary 17-hydroxycorticosteroids in patients who completed suicide, several investigators assessing plasma concentrations and urinary excretion of cortisol have suggested hyperactivity of the hypothalamic-pituitary-adrenal (HPA) axis in patients with suicidal behavior (Bunney et al 1969; Ostroff et al 1982; Prasad 1985). Postmortem studies have demonstrated corticotropin-releasing hormone (CRH) hypersecretion in patients who completed suicide (Nemeroff et al 1988; Arato et al 1989). Several studies have also reported a relationship between cortisol nonsuppression in the dexamethasone suppression test (DST) and a history of suicide attempts (Coryell and Schlesser 1981; Targum et al 1983; Robbins and Alessi 1985; Normal et al 1990; Pfeffer et al 1991). More recently, Roy (1992) failed to show a difference between suicide attempters and nonattempters for cerebrospinal fluid levels of CRH, postdexamethasone plasma cortisol concentrations, or 24-hour urinary-free cortisol levels; however, patients with a history of violent suicide attempt exhibited a higher 4:00 PM postdexamethasone cortisol level and a more frequent DST nonsuppression than nonviolent suicide attempters. In this context, the aim of the present study was to test the hypothesis that HPA axis overactivity, as assessed by the postdexamethasone cortisol level, could be in relationship with violent suicide attempts.

Methods

The study was performed in 33 DSM-III-R (APA 1987) unipolar major depressive inpatients with a history of suicide attempt during the current episode, and representing consecutive admissions to the Psychiatric Unit of the University Hospital of Liège, Belgium. The sample comprised 23 male and 10 female patients with a mean age of 39.7 years (SD ± 11.5). These patients were individually matched for gender, age (within 3 years), and, in the case of women, menopausal status, with 33 major depressive inpatients without history of suicidal behavior. All patients had a score of at least 18 on the 17-item Hamilton depression scale (Hamilton 1960) at the end of a drug-free period of at least 2 weeks. The two groups did not differ in mean age or weight.

Past history of suicide attempt was based on interviews of the patients and their family. Only suicidal behavior with a real intent to die was recorded. Suicide attempts were classified as violent (hanging, drowning, deep cuts, and shooting) or nonviolent (drug overdoses and superficial wrist cuts). The patients were free of medical illness as evidenced by history, medical examination, EKG, chest X-ray, EEG, and routine laboratory tests.

The DST was performed according to the simplified procedure described by Carroll et al (1981). Each patient received 1 mg of dexamethasone at 11:00 PM under direct nurse supervision, and a blood sample was collected at 4:00 PM the next day. We also measured 8:00 AM plasma cortisol levels 1 day before the DST procedure. Concentrations of total cortisol were determined by radioimmunoassay (RIA), with intra- and interassay coefficients of variation of 4.3% and 8.3%, respectively (Sulon et al 1978). We considered DST nonsuppression for all cortisol values higher than 5 μg/dl (Carroll et al 1981). The protocol was approved by the Ethical Committee of the University of Liège Medical School, all patients were fully informed of the study and gave their consent.

The cortisol levels after dexamethasone of patients with and without history of suicide attempt were compared using analysis of variance (ANOVA), whereas, the comparison of violent and nonviolent suicide attempters by covarying for age and melancholia. We also used the chi square procedure.

Results

There was no significant difference between suicide attempters and nonattempters for the severity of depression as assessed by the Ham-

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ilton depression scale scores: 25.5±6.0 vs. 24.8±3.5 ($F = .4, p = .5$). Moreover, violent attempters were not more severely depressed than nonviolent attempters: (for HAMD scores) 27.0±6.5 vs. 24.4±5.4 ($F = 1.6, p = .2$). There was no significant effect of age ($r = .10$, NS) or melancholia ($r = .08$, NS) on postdexamethasone cortisol levels in the total population of depressed patients.

There was no statistically significant difference between suicide attempters and nonattempters for 4:00 PM postdexamethasone cortisol levels: 6.4±6.4 μ/dl vs. 6.8±6.4 μ/dl ($F = .1, df = 2,64, p.8$); or for 8:00 AM predexamethasone cortisol levels: 16.5±5.4 μg/dl vs. 17.4±9.4 μg/dl ($F = 1.7$, $p = .2$). Fifteen of the 33 (45%) patients with a history of suicide attempts were nonsuppressors compared to 16 of the 33 (48%) nonattempters (chi square = 0.0, $df = 1, p = .8$).

Mean postdexamethasone cortisol levels did not exhibit any significant difference between violent (n = 14) and nonviolent (n = 19) attempters: 5.7±4.1 μg/dl vs. 6.8±7.8 μg/dl ($F = 0.5, df = 4,29, p = .5$). Moreover, patients with a history of violent suicide attempts exhibited more frequent DST nonsuppression (8/14 = 57%) than nonviolent attempters (7/19 = 37%), but this difference did not reach statistical significance (chi square = 1.33, $df = 1, p = .25$).

Discussion

In our study, we did not find any relationship between 4:00 PM postdexamethasone cortisol levels and history of suicide attempts in major depression. Similarly, there was no significant difference between violent and nonviolent attempters for postdexamethasone cortisol concentrations. Moreover, patients with a history of violent suicide attempts were more frequently cortisol nonsuppressors than nonviolent attempters, but this difference was not statistically significant. Thus, these results do not support the HPA axis overactivity hypothesis of suicidal behavior in depression.

This negative report is in agreement with previous studies (Brown et al 1986; Kocsis et al 1986; Roy et al 1986; Schmidtke et al 1989). But, our results are partially in contrast to those of Roy (1992) who showed a statistically significant difference between violent and nonviolent suicide attempters for 4:00 PM postdexamethasone cortisol levels. Moreover, all patients who had made a violent attempt exhibited DST nonsuppression compared to 50% of the nonviolent attempters.

Some differences in the methodological approach could explain these discrepancies. First, all of our depressed patients had attempted suicide during the current depressive episode. Second, our sample included more violent suicide attempters (n = 14) than in the study of Roy (n = 7).

In conclusion, these results suggest that DST nonsuppression cannot be considered as a biological marker of suicidal behavior. In particular, hyperactivity of HPA axis in depression does not seem to be related to history of violent suicide attempts.

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