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Cortisol Levels Are More Elevated In Female University Students Than In Their Male Counterparts In Uburu, Ebonyi State, Nigeria.

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Abstract

Complex perturbations of health occurrs in individuals with sustained, elevated cortisol levels. During times of stress, the body can release cortisol after releasing its "fight" or "flight" hormones such as adrenaline. We therefore studied levels of cortisol among apparently healthy university students by standard methods. On the main, the students were aged between 13-27 years. There were 69 males (45.7%) and 82 females (54.3%). The females showed a pattern of higher levels of cortisol, 562.0± 0.0 and the males 555.0± 2.9 nmol/L. The statistical difference between the results for the males and females was significant, P< 0.05. Close monitoring of the female students for the effects of sustained higher levels of cortisol is recommended.

Keywords: Cortisol levels, elevated university female students, Uburu.

Introduction

Cortisol is a steroid hormone that helps regulate blood pressure, blood sugar, tissue repair and the body's response to stress. (1). These stated functions are carried out by cortisol binding to

glucocorticoid or mineralocorticoid receptors inside a cell which then bind to DNA to effect gene expression (2,3). Problems with the adrenal gland can cause them to make too much cortisol (4). The most common is adrenal adenoma (5).

Cortisol levels in adolescent females can vary depending on a number of factors, including puberty, menstrual cycles and the presence of certain disorders (6). We describe our findings in a study of cortisol levels in undergraduate students in Uburu, Ebonyi State, Nigeria in this paper.

Materials and Methods

This research was conducted at David Umahi Federal University of Health Sciences, Uburu, Ebonyi State, Nigeria. Ethical clearance for the study was obtained from the Ebonyi State Ministry of Health Research Ethics Committee. Students were enlisted into the study prospectively and consecutively after informed consent. Interviewer-administered questionnaires were used on consenting participants to determine their socio-demographic characteristics such as age, gender, marital status, sexual activities, history of blood transfusion, e.t.c.

Blood was collected from the ante-cubital fossa by venepuncture for measurement of cortisol levels among others. 4.5 ml of whole blood was collected and dispensed into appropriate containers. All samples were processed and analyzed within 3 hours of collection.

Cortisol levels were assessed by standard diagnostic assay using Finecareplus Fluorescence Immunoassay (China).

Data sets were entered on a designed excel template and exported to IBM SPSS Statistic software 23.0 for analysis.

Results between groups were compared using students' t-test. Findings are presented in tables.

$P< 0.05$ was inferred to statistically significant.

Results

Table 1: Age and sex distribution of the undergraduates studied

Age Range	Undergraduate Subject	
(Yrs)	M(%)	F(%)
13-19 20-26 >27	42 26 1	63 19 0
Subtotal	69 (45.7)	82 (54.3)
Total	151 (100)	

Table 2: Serum Cortisol Levels of the male and female students

Test	Subjects M (n=69)	F (n=82)	P Value
Cortisol (nmol/L)	555.0± 2.9	562.0± 0.0	0.05
Total	151		

Discussion

Our results confirmed subjective higher values of cortisol in female undergraduates than the make counterparts in Uburu, Ebonyi State, Nigeria. The cause of this higher level of cortisol in female students than the male is uncertain. But some previous results give an insight to causes of higher levels of cortisol in female.

Prolonged emotional or physical stress has been reported to lead to sustained high levels of cortisol as part of the body's stress response (7). Long term use of steroids was reported to lead to extreme levels of cortisol (8).

Diet could be a factor for higher levels of cortisol as food high in added sugars, caffeine and processed ingredients can raise cortisol levels, worsening stress and leading to negative health outcomes. Over time, this can increase the risk of developing chronic conditions such as heart disease, Type 2 diabetes and even weight gain (9).

The result of this study needs the desired attention because high cortisol levels have been reported to cause a number of physical and psychological symptoms, including weight gain, skin changes, muscle weakness, hypertension, mood changes and menstrual changes among others (10).

Cortisol also triggers the release of glucose from the liver for fast energy during times of stress (11). It is known that offspring with maternal posttraumatic stress disorder are at increased risk of developing high cortisol levels (12).. 43 (34.95%) were of inverted comma shape, 8 (6.5%) of oval shape and 3 (2.4%) were triangular.

We conclude by ascertaining that higher cortisol levels among female university students in our environment is a reality. More distinct studies to identify the root cause of observation is recommended.

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