Plasma Follicle Stimulating Hormone (FSH) Level in Some Psychotic Disorders

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This study was done on twenty four female patients & eight control volunteers. Our patients included 16 schizophrenics and 8 psychotic depressives, according to PSE catego computer program, the patients were admitted to psychiatric department, Zagazig University Hospital. The study was based on measuring FSH level in plasma in both groups before & after therapy. The results showed that, on comparative assessment of basal FSH levels in control subjects Vs. groups of schizophrenics and depressives, there were significant decrease of basal FSH levels in both groups. While on comparing the basal FSH level in both schizophrenics and depressives before and after antipsychotic therapy, there were no significant differences between pre and post medication states.

(Egypt. J. Psychiat.,1994, 17: 41 - 46).

Introduction

Menstrual disturbances were noticed in psychiatric patients, especially, those who had mental illnesses. In accordance endocrinal changes present may be due to disturbance of hypothalamo- hypophyseogonadal axis of those patients. Increasing interest is being focused on anterior pituitary hormone secretion (APHS) in psychiatric disorders. Studies employing neuroendocrine strategies on patients suffering from schizophrenia are less numerous, and there are no established abnormalities that occur in such a proportion of patients with affective illness (Nicol et al., 1983). A reduction in secretion of gonadotropins has been found in some patients with chronic schizophrenia (Brambilla et al., 1977). The use of several non parametric analysis revealed significant differences in patterns of hormonal responses between depressed patients and controls for FSH, prolactin and FSH (Andrew et al., 1983). The gonadotropins may be controlled by control noradrenergic releasing mechanisms, but the nature of this interaction has yet to be clarified (Deletala 1982).

The aim of this study is to evaluate the effect of the mental illnesses, and psychotropic drugs on basal plasma FSH level and in turn on the integrity of hypothalamohypophyseo-gonadal axis.

Subjects and Method

Patients:

This study comprises twenty four psychotic female patients, selected from the psychiatric Department of Zagazig University Hospital.

- These 24 patients were diagnosed clinically according to the operational definition which is based on the Egyptian Psychiatric Association Ist edition of DMP (1979).

- PSE (Arabic version) and Catego Computer program were applied. (Wing et al., 1974).

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- These patients showed abnormal menstruation but non of them were pregnant or lactating at the time of this research. Also non of them were under any medication or suffering from any pathological conditions that may affect FSH secretion.

Control Subjects

Eight female volunteers were taken as controls and were selected from the attendants of patients. They were matched for age with the sample of patients.

All controls were free from any history of psychiatric illnesses or menstrual disturbances.

They were subjected to some parameters applied to the patients, e.g., clinical examination, and blood sampling for detection of basal FSH.

* Blood samples for basal FSH level were obtained from both groups before giving any therapy.

* Plasma FSH level were determined by enzyme immunoassay using the diagnostic kit FSH ELISA coated Microtiterstrips obtained from Behring Worke Hoechst, Orient, S.A.A. Germany.

Results

I. Characterization of sample of patients

Table 1
Type of Diagnosis

(a)	Diagnosis	No	%
	- Schizophrenic Psychosis	16	66.65
	- Depressive psychosis	8	33.35
	Total	24	100

(b)	Diagnosis	No	%
	- Chronic schizophrenia	12	75%
	- Paranoid schizophrenia	4	25%
	Total	16	100%

Table 2
Age

	Schizo Ph. Psychosis	Depressive Psych.	contol
- N	16	8	8
- Age in years			
Mean	27.8± 4.9	30.1 ± 4.2	28.4± 5.8
Range	20-35	23-36	22-37

Table 3
Age of Onset & Length of Illness

	Schizo Psychosis	Depressive Psych.
- N	16	8
- Age of onset		
- Mean	22.4±4.5	22.8±4.5
- Range	16-30	15-30
- Length of illness	5.3±1.4	7.6 ± 2.01

Table 4
Menstrual Disturbances

	Amenrrohea	Oligomenorrhea	Irregular menses	Total
- Schizo				
N	4	4	8	16
%	25	25	50	100
- Dep				
N	2	3	3	8
%	25	37.5	37.5	100
- Total				
N	6	7	11	24
%	25	29.05	45.95	100

II. Laboratory Data:

(a) Comparative Assessment of Basal F.S.H Levels in Control Group VS. Schizoph. Psychosis

group	No	Mean	SD	P
Schizophrenics	16	4.59	1.25	<0.001
- controls.	8	13.6	2.57	

(b) Comparative Assessment of Basal FSH levels in Control Subjects VS. Depressive Psychosis

group	No	Mean	SD	P
-Depressive psychosis	8	4.95	1.10	<0.001
- control subjects	8	12.94	2.38	

(c) Assessment of Basal Plasma FSH Levels in Schizophrenics Before and After Phenothiazine Therapy

	Mean	±SD	P
* Before therapy	4.6	1.39	<0.001
* After therapy	5.3	1.35	

(d) Assessment of Basal plasma FSH in Depressive Psychosis Before and After Therapy

	Mean	±SD	P
* Before therapy	4.92	0.75	<0.001
* After therapy	5.42	0.84	

Discussion

It appears that the study of FSH is based on the opportunity it provides to gain insight into neurotransmitter activity in the brains of psychiatric patients as well as the menstrual disturbances that might be present in mentally ill patients, hoping that this may lead to a better understanding of the disease as well as improve treatment. In this research, all patients, schizophrenic patients and psychotic depressives, showed menstrual disturbances in the form of amenorrhea, oligomenorrhea, irregular menses. Menstrual abnormalities in schizophrenics and affective psychotics were documented by many authors e.g. surveys undertaken before the advent of modern psychotropic drugs showed that a high proportion of female psychiatric patients, particularly schizophrenics, have disturbed menstruation (Gregory, 1957; Ripley and Papanicolaou, 1942). The menstrual periods may cease during a severe affective psychosis but this change is more common in schizophrenics and probably not more common in affective psychosis than in severe neurotic disturbances. (Slater & Roth, 1979). In order to understand these observations, we tried to study basal plasma FSH level in psychotic patients, who have menstrual disturbances. In a trial to do a scope on the function of hypothalamo-hypophyseal-gonadal system of these patients. Uncontrolled studies of fertile women with depression have revealed possibly low basal F.S.H level (Nemeroff, & Evans, 1984). In controlled study, Amesterdam et al. (1981) found similar basal gonadotropin levels and similar LH & F.S.H responses to LH-RH in depressed and normal fertile women. These studies increase the possibility of a relationship between neuroendocrine Abnormalities & depression (Lindy, et al., 1985) but remains controversial (Levy & Dixon, 1987).

Also, the reduction of basal level of FSH may be due to the chronicity of the illness because the study which has been done by Ferrier, et al., 1982 & Cotes, et al., 1978 showed no abnormalities in younger patients with acute schizophrenia. Also, the normal plasma FSH level varies according to the type of assay used. From the present study, the mean plasma FSH level was 4.59 ml/mIU for schizophrenic psychosis, and 4.95 ml/mIU for depressive psychosis. On comparative assessment of basal plasma FSH in control subjects versus the groups of schizophrenics & Depressive Psychosis, there was a highly significant decrease in both groups ($P < 0.001$). In schizophrenics, the release of hypothalamic releasing factor is under complex control, and the pituitary responsiveness to these agents is also a complex phenomenon. Brambilla, et al. (1977) reported a return of LH & FSH levels to the normal range in schizophrenics after the admission of the DA blocking therapy e.g. phenothiazines. In support of the notion that overactivity of Dopamine (DA) could be responsible for reduced FSH secretion, it has been recently observed that short term DA blockade with

metoclopramide restores LH secretion to a normal pattern in Female patients with hypothalamic amenorrhea (Holden, et al., 1973). Bunny and Davis (1965) had postulated the "catecholamine hypothesis of affective disorders". This milestone hypothesis, which addressed the possible link between the affective disorders and changes in CNS neurotransmitters, proposed that some, if not all, depressions are associated with an absolute or relative deficiency of catecholamines.

Norepinephrine activity is known to play a facilitatory secretion of gonadotropin releasing hormone which in turn FSH may be decreased in depression. Also, in this research, we did not find significant difference in FSH level before and after antipsychotic therapy neither in schizophrenics nor in depressive psychosis. Our failure to find differences in plasma FSH levels between non drug & drug conditions corresponds to the findings of Shader, et al., 1968 concerning FSH excretion in male patients as well as to the findings of Beumont et al., 1972 & 1974 concerning FSH secretion in female patients. The long period of medication may play a role in change of basal plasma FSH. But after 3 months of treatment with antipsychotic drugs patient's LH and FSH response to GnRH were normal (Alan et al., 1983). The prolonged treatment with antipsychotics may interfere with regulation of pituitary gonadotropin secretion, either directly by blockade of catecholamine receptors in the hypothalamus (Dewied and Jong 1974) or indirectly via drug induced hyperprolactinemia (Sharpe & Mc Neilly., 1979). This may explain why our patients showed non significant rise in FSH level, while they had received antipsychotics for 1 1/2 month only. Also, disturbed menstruation was still present in our patients after therapy. This is because antipsychotics probably cause endocrine side effects, e.g menstrual disturbances or galactorhea, by acting on hypothalamus (Dewied, 1967). On the other hand, a peripheral mechanism may be involved in producing this; for example it has been suggested that high circulating levels of prolactin can inhibit the action of gonadotropins on the ovaries, & thus interferes with the feedback control on the hypothalamus (Arrata & Alvarez, 1972).

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Le niveau de l'hormone de la plasma stimulant des follicules (FSH) chez quelques maladies psychotiques

Cette étude est faite sur 24 patients femelles et 8 controles. Ces patients comprennent 16 schizophrenes et 8 déprimés psychotiques selon le "PSE catego computer program", les patients ont été admis a la section psychiatrique de l'hôpital de l'université de Zagazig. L'étude est basé sur la mesure du FSH chez les deux groupes avant et apres le traitement. Les resultats ont demontré qu'il existe un baissement significant du niveau du FSH chez les deux groupes comparés. Tandis qu'il n'existe pas de difference significant entre le groupe des schizophrénes et celui des déprimés concernant le niveau du FSH avant et aprés le traitement medical.

مستوى هرمون البرولان – أ بالبلازما في بعض الإضطرابات الذهانية

يشتمل هذا البحث على دراسة العلاقة بين هرمون البرولان – أ بالبلازما وبعض الأمراض الذهانية (٢٤ إمرأه من المصابات بالأمراض الذهانية وقد تمت هذه الدراسة على ١٦ يعانون من إكتئاب ذهانى) وهذا طبقاً لمقياس إختبار الحالة الحالى وقد أدخلن ٨ من الفصام، ٨ وكذلك على عينه ضابطه مكونه من .قسم الأمراض النفسية بمستشفى الزقازيق الجامعى وقد لوحظ الآتى: .نساء من الصحيحات وكن من المرافقات للمرضى

– إنخفاض فى مستوى هرمون البرولان أ فى البلازما لكل من مرضى الفصام ١ والإكتئاب الذهانى عن المجموعة الضابطة.

– عدم تحسن مستوى هرمون البرولان – أ بعد العلاج بالعقاقير فى كل من مرضى ٢ الفصام ومرضى الإكتئاب.

وفسرت إضطرابات الدورة الشهرية للحالات بالتأثير الطرفى على المناسل وليس* بالتأثير المركزى على تحت المهاد.