ASSESSMENT OF FREE ANDROGEN INDEX IN SECOND TRIMESTER OF PREGNANCY AS A PREDICTOR OF OCCURRENCE OF PREECLAMPSIA

Samir Mohamed Elsayed, Tarek Mokhtar Toppozada, Raghda Saad Zaghloul Ahmed,* Amany Ibrahim Mohammed Azab, Amr Ahmed Ismail Elabd
Department of Obstetrics & Gynaecology, Department of Clinical and Chemical Pathology,* Faculty of Medicine, University of Alexandria.

INTRODUCTION

Preeclampsia is a pregnancy-induced syndrome, characterized by hypertension and proteinuria, affecting 3% to 5% of pregnancies. Maternal endothelial dysfunction, inflammation, and leukocyte activation are part of the pathophysiology and circulating factors originating from the uteroplacental circulation is probably essential in the clinical development of preeclampsia.

Hyperandrogenism refers to a state of androgen excess in females, characterized by elevated total or free testosterone levels or increased androgen activity at target tissues. Clinical manifestations include hirsutism, acne, menstrual irregularities, and metabolic disturbances.

Free Androgen Index (FAI) is a ratio used to determine abnormal androgen status in humans. The ratio is the total testosterone level divided by the sex hormone binding globulin (SHBG) level, and then multiplying by a constant, usually 100.

The concentrations of testosterone and SHBG are normally measured in nanomoles per liter. FAI has no unit.

AIM OF THE WORK

The aim of the study was to evaluate the correlation between free androgen index (FAI) in early second trimester between 18th and 24th weeks and occurrence of preeclampsia.

PATIENTS AND METHODS

This prospective observational study was conducted on 100 pregnant females at gestational age 18th to 24th weeks attending obstetrics clinic of ELShatby university hospital. Patients were divided into two groups according to the level of free androgen index (FAI), after approval of the Ethics committee and having informed written consent for every female included in the study.

All patients were subjected to Complete history taking, Thorough examination with careful measurement of blood pressure, routine laboratory investigations including CBC, liver functions, renal functions, coagulation profile, HbA1c, urine analysis and free androgen index (FAI).

RESULTS

A total of 100 pregnant women participated in the study after applying inclusion and exclusion criteria.

Patients were divided into two groups according to the level of free androgen index

Group I: High FAI **(≥7)**

Group II: Normal FAI (<7)

The overall incidence of preeclampsia in group I was 27 cases representing 54%, while in group II was 4 cases representing 8%. The incidence was significantly higher in group I

The overall incidence of gestational hypertension in group I was 8 cases representing 16 %, while in group II was 6 cases representing 12 %. there was no significant difference between the two groups regarding gestational hypertension.

The overall incidence of sever preeclampsia in studded cases was 3 cases representing 10% of the preeclamptic cases all among the high free androgen index group:

Table 1: Comparison between high FAI group and normal FAI group regarding the incidence of preeclampsia and gestational hypertension (n = 100)

	High FAI (≥7) (n = 50)		Normal FAI (<7) (n = 50)		χ^2	P
	No.	%	No.	%		
Preeclampsia	27	54.0	4	8.0	24.731*	<0.001*
Gestational hypertension	8	16.0	6	12.0	0.332	0.564
Normal	15	30.0	40	80.0	25.253*	<0.001*

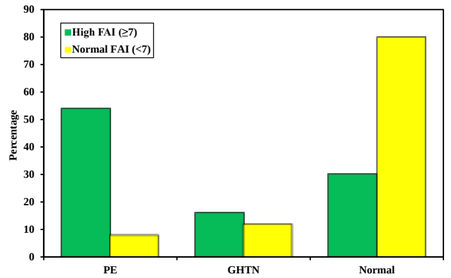

Figure1: Comparison between high FAI and normal FAI regarding the incidence of preeclampsia and gestational hypertension (n = 100)

Table 2: Distribution of the studied cases according to incidence of severity (n = 100)

	No.	%
Non-preeclampsia	69	69.0
Preeclampsia	31	31.0
Sever preeclampsia	3	10.0
Non sever preeclampsia	28	90.0

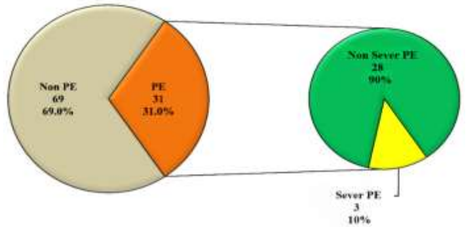

Figure 2: Distribution of the studied cases according to incidence of severity (n=100)

CONCLUSION

Taken together, we clearly demonstrated that there was a statistically significant association between elevated free androgen index in early second trimester (18-24 weeks) and subsequent development of preeclampsia particularly severe preeclampsia. The findings suggest that FAI could potentially serve as an early predictive marker for preeclampsia risk, allowing for closer monitoring and earlier intervention in high-risk pregnancies. This supports the hypothesis that androgens may play a role in the pathogenesis of preeclampsia through effects on vascular function and endothelial activity.

Early-onset pre-eclampsia in pregnant women is associated with high serum total testosterone, low SHBG and high free androgen index. The current study certainly confirmed the association between hyperandrogenism and pre-eclampsia.