MATERNAL SERUM LEVELS OF COPEPTIN AS AN EARLY PREDICTOR OF GESTATIONAL DIABETES MELLITUS

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Introduction

Diabetes mellitus in pregnancy is a serious health problem associated with both fetal and maternal complications and has long term sequelae on both mother and child. Numerous biomarkers may differentiate GDM from normoglycemic pregnancy. Such as glycemic markers and hormonal markers like copeptin.

Copeptin is the stable carboxy terminal part of preprovasopressin and a surrogate marker of vasopressin. It is well documented that circulating levels of vasopressin are elevated in diabetic patients. It could result from a relative contraction of extracellular volume induced by glycosuria, and/or from an increased sensitivity of hypothalamic osmoreceptors to the plasma osmolarity

Aim of the work

The aim of this study is to evaluate the use of maternal serum copeptin as a novel biomarker for development of GDM.

Patientsand methods

Our study is a prospective cohort study conducted on 80 pregnant females 40 of them with high risk for GDM and another 40 pregnant women as control group. They were followed from the first antenatal visit to 24th-28th weeks of gestation.

Results

12.5% of the cases in our study developed GDM later in pregnancy. the median serum level of copeptin in women who developed GDM was 400.5 (357.0 - 445.40) pmol/l, which was significantly higher than the levels observed in normoglycemic pregnant women, with values of 322.2 (283-344.9) pmol/l in the high-risk group and 317.9 (284.8–344.8) pmol/l in the control group with cut off value of 356.6 pmol/l for diagnosis of GDM and 95% C.I of (0.702 – 1.011) with p value (<0.001*). These findings suggest that serum copeptin levels could serve as a potential biomarker for the early detection of GDM.

Table (1): Comparison between the three studied groups according to Copeptin

Copeptin	Group 1 (High risk) (n = 40)		Group 2 (Control) (n = 38)	H	p
	Non-Diabetic (n = 32)	Diabetic (n = 10)			
Min. – Max.	167.80 – 375.0	309.0 – 962.0	245.40 – 384.40	13.253 *	0.001 *
Mean ± SD.	312.24 ± 44.45	454.34 ± 192.89	318.62 ± 36.66		
Median (IQR)	322.2 (283.0–344.90)	400.5 (357.0–445.40)	317.9 (284.8–344.8)		
Sig. bet. grps.	p_1<0.001*, p_2=0.781, p_3=0.001*				

Table (2):Validity (AUC, sensitivity, specificity) for copeptin to discriminate diabetic patients (n =10) from normoglycemic (n= 70)

	AUC	p	95% C.I	Cut off#	Sensitivity	Specificity	PPV	NPV
Copeptin	0.856*	<0.001*	0.702 – 1.011	>356.6	80.0	87.14	47.1	96.8

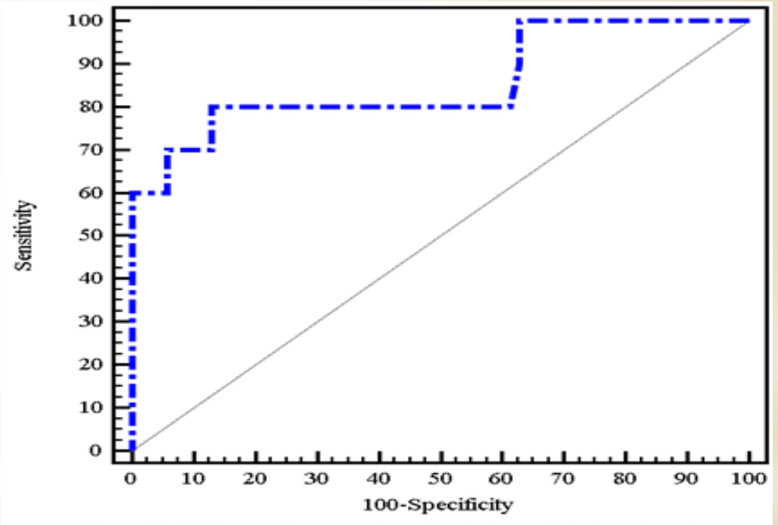

Figure (1):ROC curve for copeptin to discriminate diabetic patients (n =10) from normoglycemic (n = 70)

Conclusion

Maternal serum level of copeptin was found to be statistically non-significant in women who are at high risk to developed GDM than normal pregnant women. However, copeptin in women who developed GDM was significantly higher than normoglycemic pregnant women.

The study also found a positive correlation between maternal serum level of copeptin and BMI and fasting blood glucose level.

From this study the serum level of copeptin can be used as a diagnostic biomarker for GDM in females with one or more risk factor of diabetes.