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Serum adropin Level in Pregnancy Related Pruritus

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Abstract

History: Peptide is a 42-amino acid peptide hormone involved in glucose control. It entailed energy balance and regulation of the metabolism of glucose and fatty acids. Its shortcoming raised the danger of IR. The sensitivity to insulin and gestational mellitus diabetes (GDM) are tightly linked. Peptide may thus also affect the aetiology of GDM. Goals: The present research aimed at detecting the function of peptide and metabolism in pregnant women. Method: 60 pregnant patients with a pregnancy-related pruritus (Group A) with 30 years of matching healthy pregnancy controls were tested for this research (Group B). The research eliminated all participants with the following conditions: any pruritus classified as a particular dermatological disorder (urticaria, dermatitis, psoriasis, bite, scars and scabies), diabetic, hepatic and hypertensive patients. The liver function, blood glucose level and lipid profile were assessed in all individuals. The amount of serum peptide has been determined by means of commercially available immunosorbent assay kits. Results: Pruritus pregnant women had substantially greater eosinophilic numbers and immunoglobulin E (Ig E) (P respectively 0.05) than control group. In comparison to the control group, the total, direct bilirubin, bile acid, aspartate aminotransferase (AST), and alanine aminotransferase (ALT) (P>0.05 each, were not substantially higher for pregnant women with pruritus. and substantial positive lipoprotein (HDL) connection (P value = 0.012), but not connected to age in the pregnancy-related group with Pruritus. 33.3% of the patients investigated experienced mild itching, 45% had moderate irritation, and 21.7% had severe irritation. Conclusion: Our data imply that serum levels might be regarded as independent predictors of the sensitivity, activity and severity of pruritus associated with the pregnancy.

Key words: metabolic syndrome, pregnancy, pruritus.

1. Introduction

Pruritus is characterised as a poorly localised, unsound feeling that generally causes a desire to scratch. Pruritus is the most often documented dermatological symptom. It might be a consequence of a primary dermatological aetiology but may also be a sign of systemic illness [1].

Pruritus during pregnancy is caused specifically by pruritic hives and plaques of pregnancy (PUPP), intrahepatic pregnancy cholestasis (ICP), pemphigoid gestationis (PG), and atopic pregnancy [2].

peptide hormone involved in glucose homeostasis maintenance. The energy homeostasis and the metabolism of glucose and fatty acids [3]. Circulating protein levels were hypothesised to indicate the metabolic condition of your muscle and to improve glucose oxidation in the fed state [4].

Inhibits preadipocyte development into mature adipocytes by reduced lipid accumulation [5]. Therefore, macrophage infiltration may be reduced by fat storage and inflammation may be reduced [6].

Metabolic Syndrome (MetS) is a complex disorder with many risk variables associated with aberrant adipose accumulation and function resulting from insulin resistance (IR) [7]. MetS affects around 25 percent of the world's population with an important subgroup associated with inflammatory skin conditions [8].

The objective of this experiment was to determine the involvement of metabolic syndrome in pruritus development in pregnant women.

2. Subjects and methods

2.1. The study population:

This was a cross sectional case control study. Patients were included in this study were from outpatient clinic of Dermatology, Venereology and Andrology Department and Obstetric and Gynaecology Department of Benha University Hospitals in the period between July 2019 and March 2020 after the approval by Research Committee at Faculty of Medicine, Benha University. This study was conducted on 60 pregnant patients complaining of pregnancy related pruritus (Group A) and 30 age matched healthy pregnant controls (Group B). Every subject was informed about the aim of the study and an informed consent was obtained from each individual before sample collection. Any participant was presented with any of the following conditions was excluded from the study; any pruritus diagnosed as specific dermatologic condition (urticaria, dermatitis, psoriasis, insect bites, burn, scars, scabies), diabetic, hepatic and hypertensive cases. Patients were subjected to full history-taking including; onset, course, and duration of pruritus, stress factors, and history of itching in previous pregnancy and outcome of previous pregnancy with itching.

2.2. ELISA assays

Five mls of venous blood were used for the production of serum and ethylene diaminetetra acetic acid (EDTA) plasma for the measurements of peptide was obtained. All samples were kept at room temperature for at least 60 min to allow the blood clot formation and were later centrifuged at 20 000 RPM for 5 min and kept frozen in –80° Celsius.

2.3. Statistical Analysis

The collected data was revised, coded, tabulated and introduced to a PC using Statistical package for Social Science (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.). Data were presented and suitable analysis was done according to the type of data obtained for each parameter. Student T Test was used to assess the statistical significance of the difference between two study group means. For the comparison of the three groups' means, one way analysis of variance (ANOVA) was used. Chi-Square test was used to examine the relationship between two qualitative variables. Fisher's exact test: was used to examine the relationship between two qualitative variables when the expected count is less than 5 in more than 20% of cells. Correlation analysis: To assess the strength of association between two quantitative variables. The correlation coefficient defines the strength and direction of the linear relationship between two variables. **P** is significant if <0.05 at confidence interval 95%.

3.Results

Pregnant females with pruritus had significantly higher (P<0.001 for each) Table (1).

Table (1) Comparison of demographic and obstetric data between cases and control groups.

			Control N=30		Pregnancy Related Pruritus N=60		p
Age (years)		**mean±SD**	26.4	±5.3	27.9	±4.5	0.176
BMI (kg/m^2)		**mean±SD**	24.4	±3	25.4	±2.9	0.125
Gravidity	**Primi**	**N, %**	16	53.3%	19	31.7%	
	Multi 2	**N, %**	7	23.3%	26	43.3%	0.102
	Multi>2	**N, %**	7	23.3%	14	23.3%	
Trimester	**1st**	**N, %**	10	33.3%	20	33.3%	
	2nd	**N, %**	10	33.3%	20	33.3%	1
	3rd	**N, %**	10	33.3%	20	33.3%	
Gestational age (week)		**mean±SD**	18.2	5.6	17.5	5.2	0.736
Type of fetus	**Male**	**N, %**	11	55.0%	23	57.5%	0.854
	Female	**N, %**	9	45.0%	17	42.5%	

Table (2) Laboratory data in all studied cases.

Variables			**Pregnancy Related Pruritus (N=60)**	
Itching	**Mild**	**N, %**	20	33.3%
	Moderate	**N, %**	27	45.0%
	Severe	**N, %**	13	21.7%
Papules		**N, %**	60	100%
Excoriation		**N, %**	16	26.7%
Site	**Generalized**	**N, %**	57	95%
	Trunk	**N, %**	3	5%
Duration (months)		**mean±SD**	1.2	±0.3
Allergic disease		**N, %**	38	63.3%
BA		**N, %**	6	10%
AD		**N, %**	27	45%
AR		**N, %**	11	18.3%
Previous pregnancy itching		**N, %**	28	46.7%

4. Discussion

Pruritus is an unflagging feeling that makes you want to scratch [9]. Juckling is a frequent ailment during pregnancy in up to 14 to 23% of pregnant women [10]. It might be a consequence of a primary dermatological aetiology but may also be a sign of systemic illness [1].

The hormone of the peptide structure that has a function in avoiding the development of IR associated to obesity and metabolic regulation [11]. It controls the expression of hepatic lipogenic genes and the PPARβ receptor, the major lipogenesis regulator. It also modulates angiogenesis, improves blood flow and capillary density and protects endothelial cells [12].

Metabolic syndrome is a disorder that mostly causes IR and eventually cardiovascular consequences [13]. About 25% of the total population is afflicted with MetS, with an important subgroup connected to inflammatory skin illnesses [8].

This research found that pregnant women with pruritus had substantially higher eosinophilic count (P<0.001) than the control group.

The most frequent pregnant liver condition is intrahepatic cholestasis, defined by the inception of

pruritus and high blood ALTs and bile acids in the third quarter of pregnancy. The development of ICP, which may be further impact by prenatal hormones, was linked to genetic abnormalities of canalicular transporters [14]. Bacq et al. [15] reported moderate levels of conjugated serum bilirubin in 10 to 15 percent of the pruritis ICP. Routine liver function tests demonstrate that 60% of the patients had increased transaminases and bilirubin levels only 25%. In the great majority of patients, serum bile acids are elevated. Furthermore, Pusl and Beuers [16] showed that ICP is characterised by starving pruritus in the second or third trimester of pregnancy with high levels of bile acid. Poupon, [17] noted that serum bile acids and AST activity are the predominant biochemical changes. In addition to Lammert et al. [18], serum ALT levels in pruritus patients were reported to be 2-10-fold higher than normal in 20-60%.

The underlying common ground of MetS for pregnancy– increased blood pressure and diabetes mellitus is insulin resistance and hyperinsulinemia [19]. Low levels may result in an increased risk of IR and MetS [20]. Butler et al. [21] have described low concentrations as a risk factor for MetS IR and other characteristics, such as dyslipidemia. Its blood concentrations are inverted with BMI and age.

Regarding our data, the level of the pregnancy-related pruritus exhibited substantial negative association with TC, TG and LDL (P = 0.003, 0.043 and 0.040), respectively and substantial positive association with HDL (P = 0.012), but not connected with the age of pregnancy.

In a research comparable to our investigation, Akcilar et al. [22] reported decreasing serum TG, TC and LDL levels while increasing HDL levels in T2DM rat models. Korkmaz and Ozgun [23] have also identified a negative connection between TG and IR levels.

In this research, 33.3% of the patients investigated had mild itching, 45% had moderate irritation and 21.7% had severe irritation.

ICP-related itching is generally the most disturbing symptom for the women concerned. The buildup of bile acids in the interstitial fluid of the skin has been postulated. Serum bile acid does not, however, have a good correlation with maternal symptoms and although applying bile acids to blister bases or intradermic bile acid injections leads to pruritus [24], absolute skin bile acid levels do not correspond well with itch sensations [25]. Szczęch et al. [26] noted that 13,6% of patients had very mild, 28,8% were mild, 44,1% had moderate, 11,9% were severe, and 1,7% had very severe itching intensity. Kenyon et al. [27] also reported that pruritus was 22% moderate and just 2% serious. It is still poorly known the reason of itch associated with pregnant dermatoses. Although rare, pregnant dermatosis not only may cause pruritus, but may also lead to foetal and maternal adverse events [28]. In the pathophysiology of ICP, the link between progesterone and pruritus was first taken into account [29]. However, experimental investigations have shown the function of autotaxin as probable cholestatic itch mediators in ICP and its product Lysophosphatid Acid [30].

5. Conclusion

The research findings have indicated that Serum might play an important role in pathogenesis of a pruritus-related pregnancy serum level, as an independent predictor of the risk of pruritus susceptibility, activity and severity associated with pregnancy.

6. Recommendations

The findings of the present investigation should be evaluated in view of its limitations since a relatively small sample size was included in the present investigation. Further investigations are thus required to explore the specific processes via which pruritus-related pregnancy is pathogenesized. Further research are necessary to examine pregnancy-related pruritus serum levels before and after therapy. The level must also be tested in the tissue.

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