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The Effect of CD4+CD28 T Cells and Their Pathological Role in Pregnant Women with Diabetes with Role C. Peptide in Diabetes Diagnosis

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Abstract:
Background: Autoimmune diseases are a diverse group of conditions characterized by abnormal B cell reactivity. It is associated with T-cell responses. CD4, also known as Th, is a type of white blood cell. Helper T cells play a crucial role in maintaining immune cell homeostasis and protecting the host from pathogens (GDM), a complication of immune dysfunction in pregnant women that affects approximately 5-10% of all pregnancies CD28, a 44-kDa membrane glycoprotein, In almost all human T lymphocytes at birth. A small peptide that links the two chains of the proinsulin molecule, and is separated before insulin is released. It is released in equal amounts with insulin by pancreatic beta cells.
Objective: To estimate the percentage of T-cell, evaluate the percentage of C-peptide in DM.
Methods: Methods: 58 pregnant women with diabetes participated in the study, including 24 pregnant women with T1DM and 34 pregnant women with T2DM. C-peptide levels.
Results: All pathological samples showed a decrease in CD4+ Tcell concentration compared to control. Samples taken from T1DM patients also showed a decrease in the presence of other diseases and bacterial infections compared to T2DM patients and the absence of bacterial infections. They also showed an increase in C-peptide in diabetic patients in the presence of other diseases. C-peptide CD28 did not appear and there were no statistically significant differences.
Conclusion: There was a positive correlation between CD4 + T-cell, CD28 immunoreactivity to the incidence of T1DM, T2DM, and C-peptide in DGM.

Keywords: T1DM; T2DM; C. Peptide; GDM

The Effect of CD4+CD28 T Cells and Their Pathological Role in Pregnant Women with Diabetes with Role C. Peptide in Diabetes Diagnosis

Introduction

Definition of pregestational diabetes mellitus is the occurrence of Type 1 and Type 2 diabetes before pregnancy, whereas gestational diabetes mellitus (GDM) defines as glucose intolerance for the first time during pregnancy [1]Diabetes mellitus (DM) is a chronic disease that needs medical support and continuing patient education to avoid acute complications anddecrease the long-term complications ,[2]Diabetes mellitus (DM), a metabolic disorder caused by issues with insulin manufacturing, is defined by a sustained increase in blood glucose levels and a malfunction in the metabolism of carbohydrates, lipids, and proteins.[2] Insulin is required for cells to allow glucose entry because it binds to particular cellular receptors and allows glucose to enter the cell. It, through many mechanisms, transforms glucose into energy Type 1 Insulin Dependent Diabetes Mellitus (IDDM) is an autoimmune disease characterized by insulin insufficiency that result from a progressive immunological destruction of insulin-secreting islet B cells by reactive leukocytes and their mediators, Although the exact nature of the inducing agents and the sequence of events leading to the autoimmune destruction of islet B cells and subsequently hyperglycemia are currently not completely understood, it is well established that genetic, non-genetic, and immunologic factors contribute to the pathogenesis of T1DM Atkinson and Maclaren (1994)[4]. The two primary kinds of diabetes are insulin dependent (Type 1) and non-insulin dependent (Type 2), which are named after these two mechanisms. [5]In type 1 diabetes, there is typically either no insulin at all or not enough insulin, increased urine production, decreased appetite, and weariness are all indicators of both types of diabetes Autoimmune diseases are a diverse group of conditions characterized by the interaction of Abnormal B Cells Autoimmunity is associated with T-cell responses. CD4+ T cells, also known as Th, are a type of white blood cell. Helper T cells play a critical role in maintaining immune cell homeostasis and protecting the host from pathogens Gestational diabetes mellitus[6] (GDM) is a complication of immune dysfunction in pregnant women that affect**s.**[7] approximately 5-10% of all pregnancies worldwide. Recognition of antigen, control adaptive immune response). The subset of CD4 + T cells with a regulatory phenotype (regulatory T cells; Tregs), The CD28 costimulatory receptor, a 44-kDa membrane glycoprotein, is expressed on nearly all human T lymphocytes at birth. [8] A little peptide that connects the two chains of the proinsulin molecule and is separated before insulin is released. It is released into the bloodstream in equimolar amounts to insulin by the pancreatic beta-cells[9]" antigens are frequently found several years before the onset of autoimmune-mediated diabetes, indicating a protracted "pre-diabetic" period of autoimmune activity.[10،11] Studies that use antibodies to determine who is at risk for developing autoimmune diabetes have mostly focused on relatives of type 1 diabetes patients**.**[12،13] On antibody profiling in the general population, there are little data. According to prospective epidemiological data, many people who acquire autoimmune diabetes, particularly latent autoimmune diabetes in adults (LADA), have antibodies prior to the development of the disease and typically also have a family history of the disease.

Material and Methods

Topics of Research and Clinical Parameters

Samples were collected from Karbala Hospital for Obstetrics and Gynecology and Al-Hassan Center for Endocrinology and Diabetes in Karbala during the period from November 2022 to January 2023. This cross-sectional research included six groups: A1 pregnant women with type 1 diabetes with bacterial infection, A2 pregnant women with type 1 diabetes without bacterial infection, B1 pregnant women with type 2 diabetes with bacterial infection, B2 pregnant women with bacterial infection. Type 1 diabetes with bacterial infection, Type 2 without bacterial infection, C1 healthy pregnant women without diabetes and without bacterial infection, C2 non-pregnant women without diabetes without bacterial infection The bacterial isolates from urine were identified using the Vitec 2 automated compact system, a GN-ID card, and 64 biochemical tests 30 Samples were collected in Karbala (Imam Hassan Center for Endocrinology and Diabetes) and (Gynecology

and Obstetrics Hospital, Holy Karbala) in accordance with the directives of the World Health Organization (WHO). Diabetes was determined in order to estimate glucose and C levels. Peptide: Blood samples were collected from patients and controls, and T cells were evaluated using the immunological markers CD4 T cell and CD28 in people who were diagnosed with diabetes, while ensuring that they had not eaten for at least 8 hours. The C rate was calculated. Peptide. Using commercial ELISA kits, the percentage rise and fall of immunological markers was determined Bacterial isolates were identified from urine using the integrated Vitec 2 automated system, a GN-ID card, and 64 biochemical tests..

Statistical Analysis

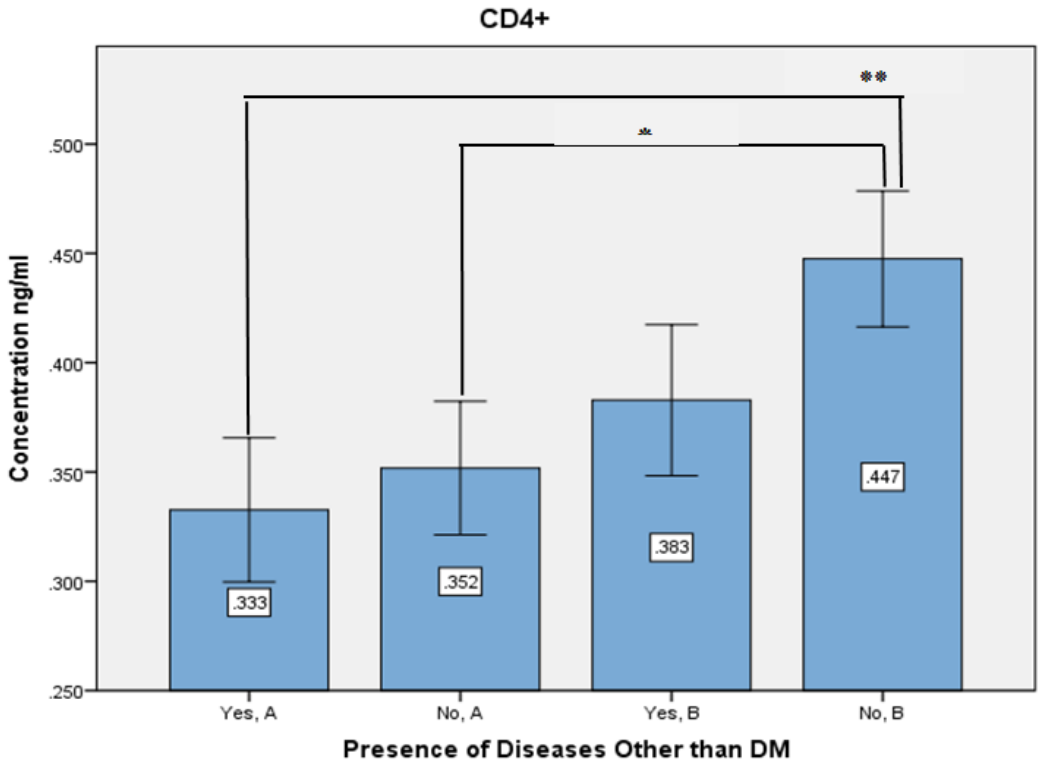
The statistical program for social sciences (S.P.S.S.) version 25 was used to enter and evaluate data from the study samples. The outcomes were reported as mean Standard Error (Mean S.E.). An independent-sample T-test was used in the statistical analysis to determine whether differences in the quantitative data were significant. One sign P 0.05, two signs P 0.01, three signs P 0.001, and four signs P 0.0001 were used to denote the probability levels.

Statement of Ethics

As a mandatory step for taking samples from patients, this study is approved by the ethical committees, which include: Imam Hussein Medical Center Committee for Diabetes and Endocrinology (No. 112 on 4/24/2022), Karbala Health Directorate/Holy Karbala Governorate - Iraq. Written consent was obtained from the patients.

Results

In comparison to the control, the concentration of Anti-GAD increased in every patient sample. We discovered that the concentrations of anti-GAD were lower in overweight individuals compared to normal weight people in the pathological samples. As indicated in figure 1. Samples of patients with diabetes for 5 years or more showed a decrease in Anti-GAD concentration compared to patients with diabetes for less than five years, but the decrease was not significant, as shown in figure 1



Figur1-: Concentration of CD4+ in groups C1, C2, A1, A2, B1 and B2. The significance value was indicated as D between C1 and A1 groups, E between C1 and B1 groups, F between C2 and A1 group, G between C2 and B1 groups, and H between A1 and B1 groups. The level of probability was 0.05 (P ≤ 0.05).

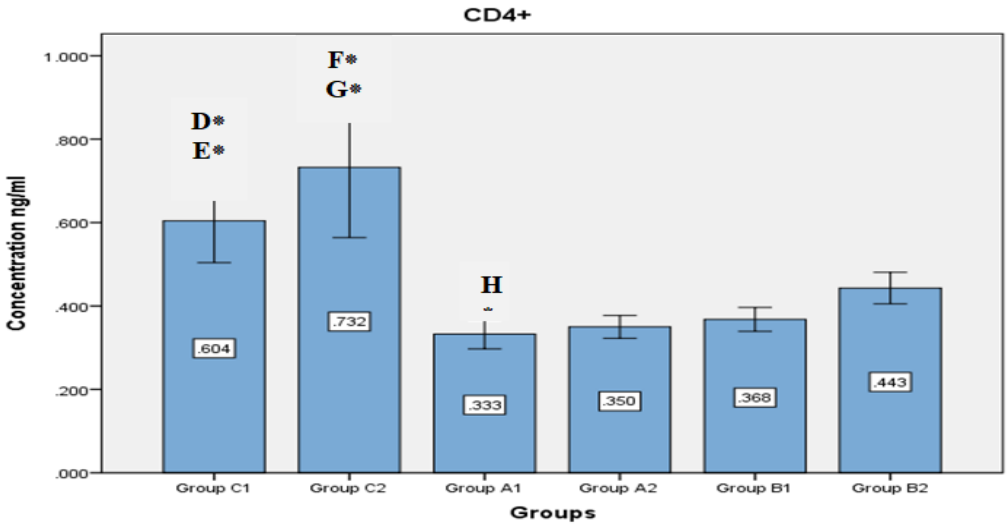


Figure 2: Concentration of CD4+ in patients of A and B groups. The significance value was indicated as * The level of probability was 0.05 (P ≤ 0.05).

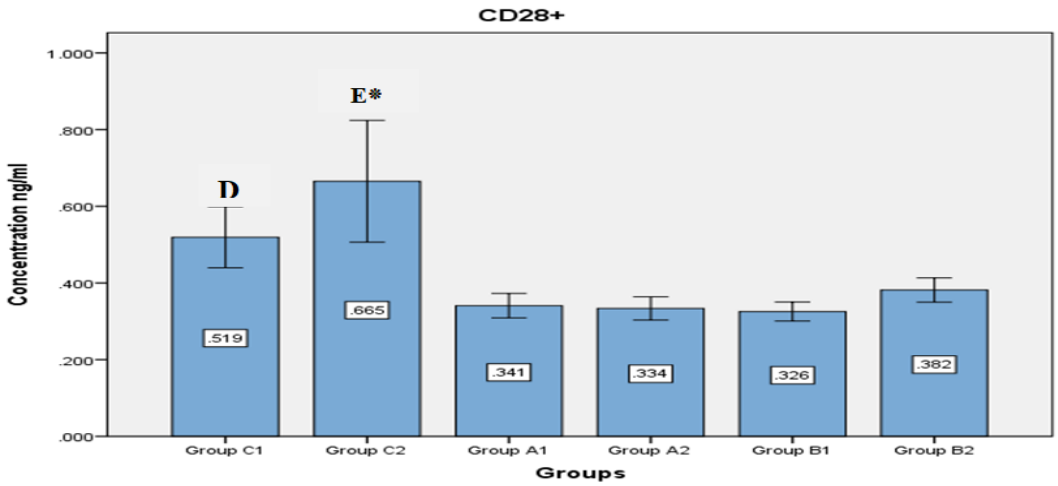


Figure 3: Concentration of CD28+ in pateints of A and B groups . The significance value was indicated as * The level of probability was 0.05 (P ≤ 0.05

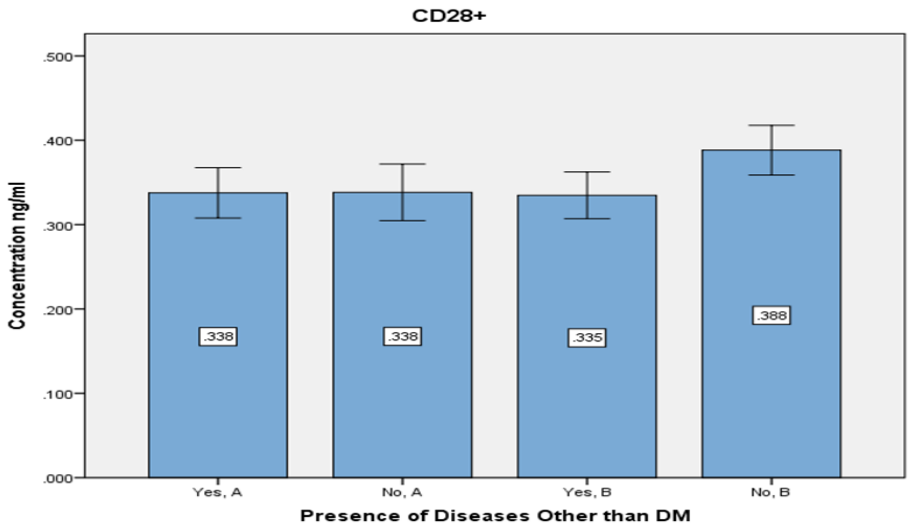


Figure 4: Concentration of CD28+ in groups C1, C2, A1, A2, B1 and B2 . The significance value was indicated as D between C1 and B1 groups, E between C2 and B1 groups . The level of probability was 0.05 (P ≤ 0.05).

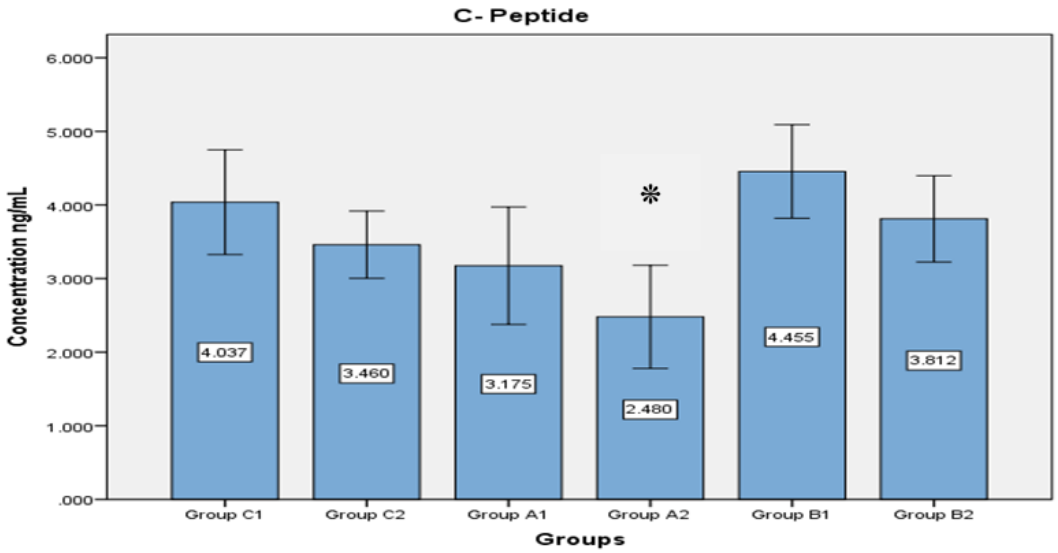


Figure5: Concentration of C. Peptide in groups C1, C2, A1, A2, B1 and B2 . The significance value was indicated as ∗ between A2 and B1 groups. The level of probability was 0.05 (P ≤ 0.05)

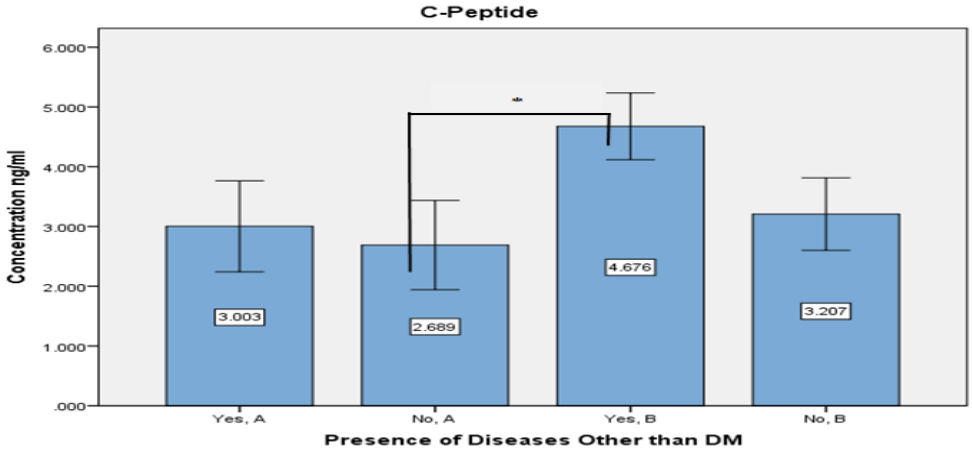


Figure 6: Concentration of C--Peptide in patients of A and B groups. The significance value was indicated as ∗ The level of probability was 0.05 (P ≤ 0.05)

In the current study, it was observed that 55.1% of those had a urinary tract infection, which was distributed as *E. coli* 46.9%, 25% with *K. pneumonia*, 6.3% with *Enterobacter cloacae*, and 9.3% with *Staphylococcus epidermidis* and 12.5% with *Staphylococcus haemolyticus*

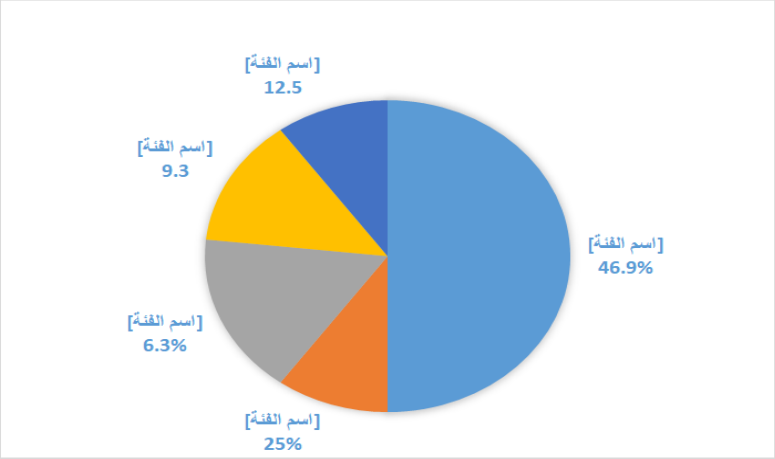


Figure7: shows the types of bacteria frequencies

Table 4-1: Bacterial etiology of UTI in diabetic individuals

No.	Types of bacteria	Number of strains		Total	%
		group A1 T1DM NO.24	group B1 T2DM NO. 34		Percentage of each type Bacteria
	Escherichia coli	**7**	**8**	**15**	**46.9%**
	Klebsiella pneumonia	**3**	**5**	**8**	**25%**
	Enterobacter cloacae	**1**	**1**	**2**	**6.3%**
	Staphylococcus epidermidis	**1**	**2**	**3**	**9.3%**
	Staphylococcus haemolyticus	**2**	**2**	**4**	**12.5%**
		14	**18**	**32**	

Regarding the aim of this study, there was a need to know the role played by autoimmune diseases Type 1 and Type 2 diabetes, especially gestational diabetes, in the recurrence of bacterial infections. We found that infection and diabetes are equal because they both cause immune system reactions, but one function protects the body while the other allows harm to the body[10]

Discussion

The results showed a significant decrease in CD4+ T-cell in the pathological samples of pregnant women with type 1 diabetes in the presence of bacterial inflammatory factor compared to the control. This is consistent with the previous study. The level of CD4+ T-cell increased in control unmarried women as in Figure (1), and this is consistent with the study. With the increase in the duration of diabetes, the data revealed a decrease in the levels of T cells, which weakens the immune system and this helps to develop other diseases associated with diabetes, as in the figure (2), and this is the result It is consistent with the study· The CD 28 percentage did not show any significant differences in the study. It only showed that the pregnancy factor has a role in the decrease or increase of these cells, as the CD 28 percentage was a significant decrease in the pregnant control compared to the unmarried control, as in the figure (3).This study agreed.The study also showed that the percentage of C-peptide decreased significantly in type 1 diabetic patients with the absence of accompanying diseases, and increased in type 2 diabetes patients with the presence of diseases, as in the figure (4).This fact is consistent with the study.Community samples have been used in many studies on C-peptide levels as they eliminate the need for insulin testing even before diabetes becomes clinically apparent. They can also predict the need for insulin in people with

type 2 diabetes. A subgroup of diabetic individuals known as latent autoimmune diabetes of adults (LADA) has also been defined by their characteristics. Generalized T-cell deficiency is known to be positive in more than 70% of people with type 1 diabetes who have just developed the disease, and its level appears to decline as the disease progresses and with fewer beta cells remaining. To obtain a more accurate knowledge and diagnosis of type 1 diabetes, it is important to know how frequently these autologous cells are present in the population. Recent research has found that CD4 and CD28 promote the incidence of autoimmune diseases, and the pregnancy factor has a major role in the high incidence of gestational diabetes.The American Diabetes Association has recommended glycated hemoglobin (C-peptide) as a potential alternative to fasting blood glucose for diagnosing diabetes. C-peptide is a vital biomarker for long-term blood sugar control because it can reflect overall blood sugar history better than insulin. Because it is in the blood for a longer period than insulin, in addition to being a reliable marker of chronic hyperglycemia, C-peptide also shows an association with Important with the possibility of long-term effects due to diabetes. A stand-alone risk factor for people with and without diabetes for coronary heart disease and stroke is high C-peptide levels, which has also been estimated. The useful information from the C-peptide test has made it a reliable biomarker for diabetes diagnosis and prognosis.All patient groups had significantly higher C-peptide values than the control group, according to the data, with overweight diabetic patients with bacterial infections having The biggest increases. Elevated C-peptide levels can be tested in obese pregnant women to look for early indicators of insulin sensitivity and resistance.

Conclusion

We found a relationship between CD4 + T-cellulose in pregnant women with diabetes and a positive relationship between the increased levels of Si-peptide in pregnant women with diabetes and its relationship with other diseases.

Compliance with ethical standards

Disclosure of conflict of interest No conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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