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RELATIONSHIP BETWEEN THE DISPARITIES OF NATIONALITY/ETHNICITY AND OTHER RISK FACTORS FROM ENVIRONMENTAL CONDITIONS FOR PREVALENCE DIABETES TYPE 2 FOR PATIENTS FROM BAGHDAD PROVINCE

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ABSTRACT

The present study was carried out to determine the ethnicity, age groups, and the gender as a risk factors to determination and prevalence type two diabetes mellitus by many methods such as biochemistry and hematological parameters such as measuring the levels of HDL and LDL in 85 patient (46 males and 39 females), whose injury with diabetic from type two, compared with 39 control (26 males and 13 females) . which for ages between 19 and ≤61 years old, which injury with this disease. This study was performed during the period from beginning in November 1/11/2016 to January 30/1/2017 from Al-Kandy Hospital and Medicinal City Hospital. This study showed no found relationship between the diabetes and the genders. Also, this study recorded no significant correlation between the sex and infected with diabetes mellitus type two under the probability (P> 0.05). Also, the results showed significant differences (p<0.05) for the relationship between the age and diabetic patients, then the type 2 diabetes mellitus, mean was most prevalent in older adults, especially in the age groups (50-60) years old. In this study showed no found relationship between the diabetes and the ethnicity. Also, this study recorded no significant correlation between the nationality and infected with diabetes mellitus type two under the probability (P> 0.05). Whilst this study showed no found relationship between the diabetes and HDL Levels. Also, this study recorded no significant correlation between HDL Levels and infected with diabetes mellitus type two under the probability (P> 0.05). Finally, this study recorded no significant between the diabetes and the LDL Levels and infected with diabetes mellitus type two under the probability (P> 0.05). Also, this study recorded no significant correlation between the smoking and infected with diabetes mellitus type two under the probability (P> 0.05). While by reading the results, it's clear that the proportion of nonsmokers were 60 (48.4%), but the ratio of smokers was 25(20.2%) from the total cases 85(68.5%). This study recorded high significant correlation between blood pressure and infected with diabetes mellitus type two under the probability (P> 0.0001). This table demonstrated the number and percentage of diabetic patients whose infected with hypertension were 47(37.9%), compared with non-infected, which were 38(30.6%). Also, this study recorded high significant correlation between body mass index and infected with diabetes mellitus type two. Therefore, the frequency of overweight category was 61(49.2%), compared with another category.

I. **INTRODUCTION**

Diabetes is a complex, chronic illness requiring continuous medical care with multifactorial risk-reduction strategies beyond glycemic control. Also, ongoing patient self-management education and support are critical to preventing acute complications and reducing the risk of long-term complications. Significant evidence exists that supports a range of interventions to improve diabetes outcomes (Cefalu,2017a). Then the type 2 diabetes mellitus, (due to a progressive loss of b-cell insulin secretion frequently on the background of insulin resistance). Gestational type 2 diabetes mellitus (GDM) (diabetes diagnosed in the second or third trimester of pregnancy that was not clearly overt diabetes prior to gestation). Therefore, specific types of diabetes due to other causes, such as, monogenic diabetes syndromes (such as neonatal diabetes and maturity-onset diabetes of the young [MODY]), but diseases of the exocrine pancreas (such as cystic fibrosis), and drug- or chemical-induced diabetes (such as with glucocorticoid use, in the treatment of HIV/AIDS, or after organ transplantation) (Cefalu,2017b). Also, the type 2 diabetes mellitus (T2DM) is a chronic metabolic condition characterized by chronic hyperglycemia due to deficiency in the secretion and/or function of insulin (such as, insulin resistance). Both the incidence and prevalence of T2DM, are increasing worldwide, particularly in developing countries, in conjunction with increased obesity rates and westernization of lifestyle. Then, T2DM: is known to be associated with a reduced life expectancy and increased morbidity. Although cardiovascular disease (CVD), is the commonest cause of mortality and morbidity, T2DM is also associated with an increased risk of other diseases including cancer, chronic liver disease, cognitive decline and accelerated arthritis, in addition to, the micro vascular and macro vascular complications. Therefore, T2DM management places a significant burden of care on each country's health system

(James,2017). But several lines of evidence support the principle of inherited genetic susceptibility as an important risk factor for common T2DM. Also, the offspring of a parent with T2DM face a 40% life-time risk of developing T2DM, increasing to 70% when both parents have T2DM (Meigs *et al*., 2000). While the mode of genetic transmission of common T2DM, unlike monogenic diabetes, does not follow simple Mend Elian patterns. Twin studies have assessed the relative importance of heredity and environment on the etiology of T2DM. In a population-based cohort of twins in Finland, the cumulative concordance rate of T2DM was clearly higher among monozygotic (MZ) twins (34% probandwise and 20% pairwise) than dizygotic (DZ) twins (16% probandwise, 8% pairwise), while the cumulative incidence of diabetes did not differ between MZ and DZ twins (Kaprio *et al*., 1992). Therefore, Murea *et al.* (2012), understood the pathogenesis of T2DM, and related vascular complications. And these findings, may ultimately lead to novel treatment options for disease prevention or delaying progression. Two major paradigms jointly underlie the development of T2DM, and related coronary artery disease, diabetic nephropathy, and diabetic retinopathy. These paradigms include the genetic risk variants and behavioral/environmental factors. This article systematically reviews the literature supporting genetic determinants in the pathogenesis of T2DM, and diabetic vasculopathy, and the functional implications of these genes variants on the regulation of beta-cell function and glucose homeostasis. Also the researcher Ershow (2009), while asserts on prevalence of obesity and diabetes are a consequence of widespread environmental changes affecting energy balance and its regulation. These environmental changes range from exposure to endocrine disrupting pollutants to shortened sleep duration to physical inactivity to excess caloric intake. Overall, we need a better understanding of the factors affecting individual susceptibility and resistance to adverse exposures and behaviors and of determinants of individual response to treatment. Obesity and diabetes prevention will require responding to two primary behavioral risk factors: excess energy intake and insufficient energy expenditure. Adverse food environments (external, no physiological influences on eating behaviors) contribute to excess caloric intake but can be countered through behavioral and economic approaches. Adverse built environments, which can be modified to foster more physical activity, are promising venues for community-level intervention. Techniques to help people to modulate energy intake and increase energy expenditure must address their personal situations: health literacy, psychological factors, and social relationships. Behaviorally oriented translational research can help in developing useful interventions and environmental modifications that are tailored to individual needs. Really people with diabetes may have an increased risk of heart disease, which is further elevated if they smoke. Because the T2DM, acts in several ways to damage the heart; high glucose levels affect the walls of the arteries making them more likely to develop fatty deposits which in turn make it more difficult for the blood to circulate. So people with T2DM, are more likely to have high blood pressure, high levels of fats such as triglycerides and also more likely to have lower levels of the protective HDL cholesterol (Jane *et al.*, 2013). Based on the study carried out by Egede *et al.* (2002), to evaluate the relations among smoking, body weight, body fat distribution, the following findings were made; In the short term, nicotine increases energy expenditure and could reduce appetite, which may explain why smokers tend to have lower body weight than non-smokers and why smoking cessation is frequently followed by weight gain. In contrast, heavy smokers tend to have greater body weight than light smokers or nonsmokers. The study concludes that smoking increases insulin resistance and is associated with central fat accumulation.30 Smokers with T2DM, are at increased risk of illness and premature death, mostly through development of cardiovascular disease, but other disease processes associated with T2DM, may also be made worse by smoking. Also, the effects of smoking on the blood vessels of the body, inflammation, and other possible factors may also contribute to the very serious negative consequences of cigarette smoking for people with T2DM. Health disparities in diabetes and its complications and co-morbidities exist worldwide. It is well-documented that race/ethnic minorities have a higher prevalence of diabetes than non-minority individuals. There are multiple factors that contribute to these disparities, including biological and clinical factors, as well as health system and social factors. This review will expand on a prior comprehensive review of T2DM disparities in adults summarized in an Endocrine Society Scientific Statement on Health Disparities in Endocrine Disorders. by briefly touching on its major findings but also describing race/ethnic differences in type 1 diabetes (T1D) in children and adults (Golden *et al.*, 2012). Therefore, the aims of this study are determining the majority potential risk factors from the affects environmental conditions such as the

race, smoking , over obesity, and body mass index which possible to associate in developing complication for injury to individuals with diabetes. On the other hand, to measure levels of HDL and LDL by using several methods, such as biochemistry and hematological testes. Finally, to reduce the incidence of injury with diabetes mellitus type 2 in the future, either by using the appropriate therapy or modulating the environmental condition, which can causative this potential risk factor.

II. MATERIAL AND METHODS

This study was performed during the period from beginning in November 1/11/2016 to January 30/1/2017. This study included 85 cases (patients suffering from DM type 2, in which 39 females and 46 males), from Al-Kandy Hospital and Medicinal City Hospital . Also 39 non diabetic persons as a control (apparently healthy persons).

BLOOD COLLECTION AND SAMPLES: Three ml of blood samples were collected by vein puncture , where using disposable syringes from each patient and healthy person. Then placed in centrifuge test tube and left to separate by centrifuge process for period about (3 -5) minute in 1000 rpm; to obtain the serum. After that put the serum in the cuvette of the device called Siemens' device. After that we get the results in less than 5 minutes.

PARAMETERS: This study included many subjects were examined, such as age, sex, nationality, residence, the smoking and alcohol intake.

SIEMENS' DEVICE: Whether it's test routine for glucose, HbA1c, urinary albumin, or esoteric tests for insulin, C-peptide or Cysteine C, Siemens' extensive menu provides a full complement of tests across platforms. Two common comorbidities of diabetes are hyperlipidemia and cardiovascular disease. Also, Siemens offers a comprehensive portfolio of lipid testing solutions. The American Diabetes Association (ADA) recommends that all adult patients with diabetes have their lipid profile determined yearly. This profile includes total cholesterol, HDL cholesterol, triglycerides, and calculated LDL cholesterol. In the fact, if the triglyceride level is high a direct LDL measurement should be strongly considered. If values are at low-risk levels (LDL <100 mg/dl, triglycerides <150 mg/dl, and HDL >50 mg/dl), assessment may be repeated every 2 years. Chi-square was used to detect the significance differences among the variables of our study, by using SPSS ver. 18.0 (IBM SPSS Statistical 23,2016)

RESULTS AND DISCUSSION

The results in table 1, demonstrated the association between the patients whose infected with diabetes mellitus type two and age groups. Then the age group (50-60) year for study group (case) which infected with diabetes mellitus type 2 (patients), represent 33(26.6%) from 85(68.5%) patients, compared to other age groups and control. Therefore, this age group (50-60) year, represent the most group infected with diabetic. Also this table shows a significant correlation between age groups, and infected with diabetes mellitus type two (P≤ 0.05). This result recordance with Chentli (2015), when they observed, where the prevalence of diabetes was increasing with age or growing old. But this result conflict with Al-Saeed *et al.* (2011), When they found the negative effect of diabetic on morbidity and mortality is greatest for those diagnosed at a young age compared with T2DM of usual onset. These results highlight the growing imperative to direct attention toward young-onset type 2 diabetes mellitus and for effective interventions to be applied before middle age. This positive relationship between the T2DM, and age, or the peak prevalence of diabetes can be refers to the hypertension, overt proteinuria, IFG and high total cholesterol were independent risk factors for new onset diabetes (Peng *et al*., 2010). Also T2DM was most prevalent in older adults. But due to widespread poor lifestyle habits, it's more common in younger people than ever before.

Table 1: The relationship between the study groups (case and control) for infested with diabetes mellitus and age groups.

Study Groups	**Age Groups (Years)**			**Total**
	(19-49)	(50-60)	61≥	
Case	31 25.0%	33 26.6%	21 16.9%	85 68.5%
Control	25 20.2%	10 8.1%	4 3.2%	39 31.5%
Total	56 45.2%	43 34.7%	25 20.2%	124 100.0%
p-value = 0.01 (P< 0.05) Significant (S)				

In this study showed no found relationship between the diabetes type 2 mellitus, and the genders (Table-2). Also, this study recorded no significant correlation between the sex and infected with diabetes mellitus type 2, under the probability (P> 0.05).

Table 2: The relationship between the study groups (case and control) for infested with type 2 diabetes mellitus, and genders.

Study Groups	Genders		Total
	Female	Male	
Case	39 31.5%	46 37.1%	85 68.5%
Control	13 10.5%	26 21.0%	39 31.5%
Total	52 41.9%	72 58.1%	124 100.0%
p-value = 0. 1(P > 0.05) NS			

Table 3 showed no found relationship between the diabetes type 2 mellitus, and the nationality. Also, this study recorded no significant correlation between the nationality and infected with type 2 diabetes mellitus type two under the probability (P> 0.05). In this study the race Muslim recorded high percentage, where 45(36.3%) from infested cases, which were 85(68.5%). And compared with other racial groups in this study. This result not consensual with Spanakis and Golden (2013), when they found the ethnic differences in the epidemiology of diabetes, prediabetes, and diabetes complications and mortality in the United States and globally. And biological, behavioral, social, environmental, and health system contributors to diabetes disparities in order to identify areas for future preventive interventions. Also, this study recorded no significant correlation between the nationality and infected with diabetes mellitus type two, back to lack of finding people with different nationalities. Due to migration and poor political conditions in Iraq finally. Also, may be refers to many factors, such as access to health-care and other socioeconomic factors, and the type 2 diabetes mellitus affects different ethnic groups in different methods, and response to genetic markers, risk factors, geographic distribution of peoples, climates and family history.

Table 3: The relationship between the study groups (case and control) for infested with diabetes mellitus type 2, and nationality (ethnicity).

Study Groups	**Nationality/Ethnicity**				
	Christian	**Kurdish**	**Muslim**	**Turcoman**	
Case	11 8.9%	12 9.7%	45 36.3%	17 13.7%	85 68.5%
Control	7 5.6%	7 5.6%	18 14.5%	7 5.6%	39 31.5%
Total	18 14.5%	19 15.3%	63 50.8%	24 19.4%	124 100.0 %
p-value = 0.7(P> 0.05) NS					

There is no relationship between the type 2 diabetes mellitus and HDL Levels as shown in Table 4. Also, this study recorded no significant correlation between HDL Levels and infected with diabetes mellitus type two, under the probability (P> 0.05). But abnormal case for patients recorded 56 (45.2%), compared with normal HDL level, which were 29 (23.4%) from total cases 85(68.5%). This study contradiction the study of Haase *et al.* (2015), when they found lifelong low levels of HDL cholesterol due to genetic variation in HDL cholesterol–related genes are not associated with the increased risk of type 2 diabetes in the general population. These findings suggest that low levels of HDL cholesterol per se do not cause type 2 diabetes mellitus. Consequently, this plasma HDL cholesterol increasing as a novel therapeutic option for treatment or prevention of type 2 diabetes mellitus, as recently suggested.

Table 4: The relationship between the study groups (case and control) for infested with diabetes mellitus type 2, and HDL levels.

Study Groups	HDL Levels		Total
	Normal	Abnormal	
Case	29 23.4%	56 45.2%	85 68.5%
Control	19 15.3%	20 16.1%	39 31.5%
Total	48 38.7%	76 61.3%	124 100.0%
p-value = 0. 1 > 0.05 NS			

The results present in table 5 showed no found relationship between the type 2 diabetes mellitus and the LDL Levels. Also, this study recorded no significant correlation between LDL Levels and infected with type 2 diabetes mellitus, under the probability (P> 0.05). But normal case for patients recorded high percentage, which were 46(37.1%), compared with normal LDL level, which were 29(23.4%), from total cases 85(68.5%). Compared with abnormal LDL level, which were 39(31.5%) and control. This results disagreement with Singla *et al.*

(2009), when they found the LDL: HDL ratio, were found to be significantly increased in the diabetic group as compared to the control group (P< 0.001). LDL: HDL ratio was also increased in the diabetic group as compared to the control group.

Table 5: relationship between the study groups (case and control) for infested with diabetes mellitus and LDL levels.

Study Groups	LDL Levels		Total
	Normal	Abnormal	
Case	46 37.1%	39 31.5%	85 68.5%
Control	21 16.9%	18 14.5%	39 31.5%
Total	67 54.0%	57 46.0%	124 100.0%
p-value = 0. 9> 0.05 NS			

No relationship found between the diabetes and the smoking (Table 6). Also, this study recorded no significant correlation between the type 2 diabetes mellitus and smoking and infected with diabetes mellitus type two under the probability (P> 0.05). While by reading the results, it's clear that the proportion of nonsmokers were 60 (48.4%), but the ratio of smokers was 25(20.2%) from the total cases 85(68.5%). This result disagreement with Chang (2012), when he found Smoking increases the risk of developing diabetes and aggravates the micro- and macro-vascular complications of diabetes resistance, inflammation and dyslipidemia, but the exact mechanisms through which smoking influences type 2 diabetes mellitus are not clear. However, smoking cessation is one of the important targets for the type 2 diabetes mellitus, control and the prevention diabetic complications. Therefore, the cigarette smoking is a well-known risk factor in many diseases, including various kinds of cancer and cardiovascular disease. Many studies have also reported the unfavorable effects of smoking for type 2 diabetes mellitus. While the reason for the result is not significant for the relationship between the type 2 diabetes mellitus and smoking, is due to the size of sample that does not represent as whole population. As well as the sample selection randomly. Also, the number and percentage of females more than males in this study. This gives a clear picture on less of smoker's patients. Because our society is conservative. Also, our traditions prevent the women from smoking.

Table 6: relationship between the study groups (case and control) for infested with type 2 diabetes mellitus, and smoking.

Study Groups	Smoking		Total
	Yes	NO	
Case	60 48.4%	25 20.2%	85 68.5%
Control	31 25.0%	8 6.5%	39 31.5%
Total	91 73.4%	33 26.6%	124 100.0%
p-value = 0. 2> 0.05 NS			

Table 7 showed found relationship between the diabetes and blood pressure. Also, this study recorded high significant correlation between blood pressure and infected with type 2 diabetes mellitus under the probability (P> 0.0001). This table demonstrated the number and percentage of diabetic patients whose infected with hypertension, were 47(37.9%), compared with non-infected, which were 38 (30.6 %). This result agreement with Cheung and Li (2012), when they proved the diabetes and hypertension frequently occur together. There is substantial overlap between diabetes and hypertension in etiology and disease mechanisms. Obesity, inflammation, oxidative stress, and insulin resistance are thought to be the common pathways. Recent advances in the understanding of these pathways have provided new insights and perspectives. Physical activity plays an important protective role in the two diseases. Knowing the common causes and disease mechanisms allows a more effective and proactive approach in their prevention and treatment. This refers to the high blood pressure, or hypertension, is a condition that's often present in people with type 2 diabetes mellitus. It's unknown why there's such a significant correlation between the two diseases. It's believed that obesity, a diet high in fat and sodium, and inactivity contribute to both conditions (Jovinelly, 2017).

Table 7: The relationship between the study groups (case and control) for infested with T2DM and blood Pressure.

Study Groups	Blood Pressure		Total
	Yes	No	
Case	47 37.9%	38 30.6%	85 68.5%
Control	36 29.0%	3 2.4%	39 31.5%
Total	83 66.9%	41 33.1%	124 100.0%
p-value = 0.000< 0.0001 HS			

Table 8: The relationship between the study groups for infested with DMT2 body mass index.

BMI	Frequency	Percentage %
Mild Thinness	1	0.8
Normal	31	25.0
Obese Class I	25	20.2
Obese Class II	3	2.4
Obese Class III	3	2.4
Overweight	61	49.2
Total	124	100.0

In this table showed found relationship between the diabetes and body mass index. Also, this study recorded high significant correlation between body mass index and infected with diabetes mellitus type two. Therefore, the frequency of overweight category were 61(49.2%), compared with another category. This results recordance with results of Bays *et al.* (2007), when they arrived at the prevalence of diabetes mellitus, hypertension and dyslipidemia was estimated within BMI categories, as was distribution of BMI levels among individuals with these diseases. Also iincreased BMI was associated with increased prevalence of diabetes mellitus, hypertension and dyslipidaemia in both studies ($p<0.001$). For each condition, more than 75% of patients had BMI ≥ 25 kg/m^2. Estimated prevalence of diabetes mellitus and hypertension was similar in both studies, while dyslipidaemia was substantially higher in NHANES than SHIELD. In both studies, prevalence of diabetes mellitus, hypertension and dyslipidaemia occurred across all ranges of BMI, but increased with higher BMI. However, not all overweight or obese patients had these metabolic diseases and not all with these conditions were overweight or obese. Except for dyslipidaemia prevalence, SHIELD was comparable with NHANES. Consumer panel surveys may be an alternative method to collect data on the relationship of BMI and metabolic diseases. As well as Schienkiewitz *et al.,* (2006), the weight gain in early adulthood is related to a higher risk and earlier onset of type 2 diabetes mellitus, than is weight gain between 40 and 55 y of age. Then the causes of diabetic association with BMI are due to the phenomenon of obesity paradox. Also, especially in patients with type 2 diabetes mellitus (T2DM). We investigate the association between BMI and all-cause mortality in Taiwanese patients with T2DM to define the optimal body weight for health (Kuo et al., 2015).

IV. CONCLUSION

The results showed that the type 2 diabetes mellitus most prevalent in older adults. Also, recorded no significant correlation between the sex and infected with diabetes mellitus type two. So. this study recorded no significant correlation between the nationality and infected with diabetes mellitus type two. This refers to many factors, such as access to healthcare and other socioeconomic factors, and the diabetes affects different nationality groups in different methods. In this study showed no found relationship between the diabetes and HDL Levels. Also, no significant correlation between LDL Levels and infected with type 2 diabetes mellitus. Then this study recorded no significant correlation between the smoking and infected with diabetes mellitus type two. So, this study recorded high significant correlation between blood pressure and infected with diabetes mellitus type two. Because the obesity, a diet high in fat and sodium, and inactivity contribute to both conditions.

This study recorded high significant correlation between body mass index and infected with diabetes mellitus type two. Therefore, the frequency of overweight category was 61 (49.2%), compared with another category. Because the overweight and obesity are contributed with impaired glucose metabolism and type two diabetes, therefore recommended in patients with diabetes type two.

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