Diabetic Mellitus as Risk Factor Cardiovascular Disease in Province of Diyala

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Abstract

The main objective of the study to study the rate of cardiovascular risk factors in patients with diabetes in the province of Diyala rate.Was conducted this study in Baquba Teaching Hospital, where the study included a group patients suffering from diabetes mellitus(D.M) during the period from the 15th of November 2013 until of 23th February 2014 which included (100) patients (58) females and(42) males and they were between the ages of (30-75 years). Interview was conducted face-to-face to fill the questionnaire forme. The study showed a lack of significant differences between males and females, and the presence of significant difference between patients with diabetes mellitus and the rate of atherosclerosis percentage (40%) P-value =. 000. The study showed that the incidence of stroke and heart attack were repeating (87%) of the disease which is the highest percentage of infection in age ranging between (70-80) P - value = .000. It was clear from our study, current that atherosclerosis was injury highest in males than in females and repeat (88.9%) and the highest rate of injury in females were angina disease percentage (38.2%) and the study recorded a significant more difference between sex and the type of cardiovascular disease .

Key words:- Coronary heart disease – diabetes mellitus - Arteriosclerosis

اصابة مرضى السكري بأمراض القلب والأوعية الدموية

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قسم التحليلات المرضيه ـ المعهد التقني \ بعقوبه

الخلاصه

الهدف الرئيسي للدراسة هو مقارنة معدل انتشار عوامل الخطر القلبية الوعائية عند المرضى المصابين بالسكري في محافظه ديالى. تم إجراء هذه الدراسة في مستشفى بعقوبة التعليمي حيث كان جميع المرضى يعانون من داء السكر خلال الفترة من شهر تشرين الثاني 2013 الى شهر شباط 2014 تم فحص (100) مريضا (58) اناث و (42) ذكور وكانت اعمارهم تتراوح بين (30 – 75) سنة . وقد تم إجراء مقابلة وجها لوجه لتعبئة الاستبيان الخاص بالدراسة، بينت الدراسه عدم وجود فروق معنويه بين الذكور والاناث ,ووجود فرق معنوي بين المرضى المصابين بالسكري والاصابه بمرض تصلب الشرايين بنسبه (40 %) 000 .P-value=. وبينت الدراسه ان نسبه الاصابه بالجلطه القلبيه كانت بتكرار (87%) وهو المرض الاعلى نسبه للاصابه في الاعمار التي تتراوح بين (70-80) وبفرق معنوي 000. = value - P . وقد اتضح من دراستنا الحاليه ان مرض تصلب الشرايين كانت الاصابه الاعلى به في الذكور عما هو عليه في الاناث وبتكرار (88.9 %) واعلى نسبه للاصابه في الاناث كانت بمرض الذبحه الصدريه بنسبه تكرار (38.2 %) وسجلت الدراسه وجود فرق معنوي كبير بين الجنس وانواع امراض القلب للمصابين بمرض السكري .

الكلمات الداله : تصلب الشرايين , مرض السكري , الامراض القلبية الوعائية

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Introduction

Diabetes mellitus is an important chronic disease which incidence is globally increasing and though considered as an epidemic (1). The World Health Organization (WHO) estimated there were 30 million people who had diabetes worldwide in 1985. This number increased to 135 million by 1995 and reached 217 million in 2005. By the year 2030 WHO predicts this number will increase to at least 366 million (1). This growth in diabetes prevalence, driven principally by an increased prevalence of type 2 diabetes (T2D), is occurring in both developing and developed countries (1). The incidence of type 1 diabetes (T1D) is also increasing in parallel to that of T2D worldwide (2–4).Individuals with diabetes and with chronically poor metabolic control can experience microvascular and macrovascular complications leading to a significant burden for the individual and for the society. This burden includes direct costs of medical care and indirect costs, such as loss of productivity, which result from diabetes-related morbidity and premature mortality (5, 6). Health care expenses for people with diabetes is more than double of that for people without diabetes; the direct and indirect expenditures attributable to diabetes in 2007 in the USA were conservatively estimated at $174 billion, with slightly more spent on chronic complications attributable to diabetes than on diabetes care itself (6). The International Diabetes Federation (IDF) estimated that diabetes accounts for 5–10% of the total healthcare budget in many countries (3). The outpatient costs of T2D in Brazil were estimated by the ESCUDI study in 2011 (7). The total costs were US$ 2,108 per patient/year, which consisted mostly of direct costs (63.3%) (7).

Cardiovascular diseases (CVD) are the most prevalent cause of mortality and morbidity among people with T2D and T1D (8–10). In 2004, in the USA the presence of CVD and stroke was found in 68% and 16% of deaths related to diabetes among people older than 65 years, respectively (11). Adult people with diabetes present rates of mortality due to heart disease and stroke from two to four times higher than those without diabetes (11). It has been stated that patients with TD without a previous history of myocardial infarction have the same risk of coronary artery disease (CADs) as nondiabetic subjects with a history of myocardial infarction (12); this has led the National Cholesterol Education Program to consider diabetes as a coronary heart disease risk equivalent (13). However, there is still some uncertainty as to whether the cardiovascular risk conferred by diabetes is truly equivalent to that of a previous myocardial infarction (14). In general, patients with diabetes aggregate other comorbidities such as obesity, hypertension, and dyslipidemia which also contribute to increase the risk for CVD (15).

Patients and Methods

A prospective study was conducted Baquba Teaching Hospital, where as all the studied patients were suffering from diabetes during the period from the 15th of November 2013 until of 23th February 2014 which included (100) patients (58) females and 42 males and were between the age of (30-75) year.The Data were collected by simple questionnaire containing some of questions about the age, gender, type of current diabetic ,the type of heart disesaes .

All the statistical analysis were done by using pantium-4 computer through the SPSS (Version 14) to analysis data. The statistical data analysis was done by using Chi-square (χ 2- test) for testing the contingency coefficient (causes correlation ship). The 0.05 level of significance was used as a criterion to determine if there was a significant difference between diabetic and heart disease (8,9)

Results and discussion

Vascular and heart diseases, are major causes of disability and death in patients with diabetes mellitus. Diabetes mellitus substantially increases the risk of developing coronary, cerebrovascular, and peripheral arterial disease. The pathophysiology of vascular disease in diabetes mellitus involves abnormalities in endothelial, vascular smooth muscle cell, and platelet function. The metabolic abnormalities that characterize diabetes, such as hyperglycemia, increased free fatty acids, and insulin resistance, each provoke molecular mechanisms that contribute to vascular dysfunction. These include decreased bioavailability.(4) . Adults with diabetes mellitus are thought to have a high risk of cardiovascular disease (CVD), irrespective of their age (table 1).

Table1 :- cardiovascular diseases in patients with diabetes mellitus according to ages

Age group (years)	Number	Percentage	Chi-Square Tests
30 - 49	22	22	X^2= 37.520
50 - 69	62	62	Df = 2
70 - 80	16	16	p-value = .000 (HS)
TOTAL	100	100	

the age between (50 - 69) was the highest (62 %) where as the stratum between the age (70 - 80) (16 %) .The patient age was significantly associated with the rate of vascular disease in the present study (P Value = .000).This was shown in study Booth GL etal (2006) (13) younger people with diabetes (age 40 or younger) do not seem to be at high risk of CVDin diabetic patients . Age should be taken into account in targeting of risk reduction in people with diabetes.(22)

Tab (2) :- cardiovascular diseases in patients with diabetes mellitus according to gender

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Gender	Number	Percentage	Chi-Square Tests
Males	45	45	X^2= 1.000
Females	55	55	Df = 1
TOTAL	100	100	P-value =.317 (NS)

Regarding the gender distribution(Table 2), shows that higher rate of heart
diseases in patient with diabetic mellitus in women (55 %)than the men   (45 %) .
This study shows that there was no statistically significant difference between males and females in the proportions of cardiovascular in the diabetic mellitus . This may inpart due to the fact that the time of collecting data conflicts with men schedule of work.

While for women the response was higher as most of them are housekeepers and unemployed.As these figures illustrate, women with diabetic in general are more likely to have cardiovascular disease than are men.

Several studies(21 ,22,23)indicated that the risk of CVD in diabetic female is higher than the risk in diabetic male. In this study, significant difference between male and female was shown, this agreed with Al Mayahi and Saleem study (2005) (4). And this study agree with study of (Ždanov and Vihert 1976) That rhe woman was more frequent in women than in men (24)

Table3: Types of heart disease in diabetics mellitus patient

Age group	Repetition	Percentage	Chi-Square Tests
Arteriosclerosis	40	40	X^2=14.880
Angina	26	26	Df = 3
Heart failure	20	20	
Myocardial infarction	14	14	P-value = .002 (HS)
TOTAL	100	100	

(Table 3) showed the highest rate of cardiovascular disesaes in patient with diabetic was arteriosclerosis The ratio (40 %) atherosclerosis cause most morbidity and mortality in patients with diabetes mellitus. Despite the frequency and severity of disease, proven medical therapy remains incompletely understood and underused.

This study was consistent with study of (Beckman et al 2002)that the highest risk in diabetic patient was artheriosclerosis (12) .

Table4: The rate of cardiovascular disease according to the age

Heart disease	Age group						Total		Chi-Square Tests
	30 - 49		50 - 69		70 - 80				
	No	%	No	%	No	%	No	%	
Arteriosclerosis	22	22	18	29	-	-	40	40	X^2 = 124.879 Df = 6 P-value = .000 (HS)
Angina	-	-	26	41.9	-	-	26	26	
Heart failure	-	-	18	29	2	12.5	20	20	
Myocardial infarction	-	-	-	-	14	87.5	14	14	
TOTAL	22	100	62	100	16	100	100	100	

A study conducted in India indicated that diabetic patients are more aware of diabetic complications than the whole population (27) The results of our study emphasize the need of multi-interventions for the multiple risk factors in diabetic patients, as the risk of CVD in diabetic patients can be lessened by a targeted, long term, intensified intervention for multiple

risk factors146. Although the relation between BMI and other risk factors was not studied in this research, but other studies(16,26) showed the importance of having normal BMI, as control of other cardiovascular risk factors decreases with having higher BMI.(16)

Table5: The rate of cardiovascular disease according to the gender

Heart disease	Gender				total		Chi-Square Tests
	Males		females				
	No	%	No	%	No	%	
Arterioscleros is	40	88.9	-	-	40	40	$X^2 = 83.683$ Df = 3 P-value =.000 (HS)
Angina	5	11.1	21	38.2	26	26	
Heart failure	-	-	20	36.4	20	20	
Myocardial infarction	-	-	14	25.5	14	14	
TOTAL	45	100	55	100	100	100	

(table 5) showed that the highest percentage the type of CVD was atherosclerosis in males, (88.9 %), in the women the highest rate of injury is the disease angina (38 .2 %) It is higher than the proportion of males.The presence of estrogen, which is working to raise the proportion of HDL cholesterol in the blood, which leads to protection or minimize the occurrence of angina pectoris, but postmenopausal women and men are equally by this disease, but if a woman suffers from the presence of sugar in the blood or increase the proportion of triglycerides in the blood, it eliminates the benefit of the hormone estrogen in women. And thus become more susceptible to angina(20). These findings are consistent with results of (Fernando K.2010) that there is significant association between coronary subclinical atherosclerosis and thepatient with diabetic .(25)

A healthy diet and exercise program can reduce the risk of developing diabetes and is essential in managing patients with existing diabetes by lowering blood pressure, cholesterol levels, and weight. For someone with diabetes who is ready to begin an exercise program, the physician should consider an exercise stress test with or without cardiac imaging because exercise may uncover previously unknown significant coronary artery disease. If diet and exercise do not control blood pressure and cholesterol, medications should be aggressively added to the treatment regimen.

Conclusions
1.A significant relationship was found between the age and type of CVD .
2. No significant relationship was found between diabetic patients age and CVD

Recommendations

1. Health education is needed to increase awareness of health professionals and public about CVD a specially in our society and give the patient with diabetic advice about proper way of care

References

1. American Diabetes Association (ADA): Type-2 diabetes in children and adolescents. Diabetes Care,(2000); 23: 381-389

2. American Diabetes Association (ADA): Report of the expert committee on the diagnosis and classification of diabetes mellitus Diabetes Care,(2001); 24 (Suppl.1): S5-S20

3. Atkinson MA. and Eisenbarth GS: Type 1 diabetes: new prospective on disease pathogenesis and treatment. Lancent(, 2001):29-221:(9277) 358 ;

4. Berneyy, T; Biibler, L, Caulfield A, Toso, CB, Alejandro, R Cooper,D, Ricordi,C, Morel, PB.: Transplantation of islets of Langerhans: new developments. Swiss Med Wkly(2002); 132: 671-680

5. Brajendra, K, and Srivastava, A.: Diabetes mellitus complication and therapeutics.. Med Sci Monit, 2006; 12(7): RA130-147

6. Defronzo RA: Pathogenesis of type 2 diabetes: metabolic and molecular implication for identifying diabetes genes. Diabetes Rev 267-177:5; 1997 ,

7. Frank, A. Deng S. Huang, X. et al: Transplantation for Type 1 Diabetes: Comparison of Vascularized Whole- Organ Pancreas With Isolated Pancreatic Islets. Annals of Surgery .Volume 240 , Number 4, October(2004); 631-643 .

8. World Health Organization. Report of expert committee in physical status, the use and interpitration of anthropometry. WHO Report series. 1995; p: 854.

9. Owen OG. The collaborative atorvastatin diabetes study: preliminary results. *International Journal of Clinical Practice*. January(2005). 59(1):121-3.

10. Gale, E and Anderson, J.: Diabetes mellitus and other disorders of

metabolism. In, Kumar and Clark Clinical medicine, 6th ed.(2005)

vol. 19, 1110- 1112 .

11.Kuzuya, T., Nakagawa, S., Satoh, J.: Report of the committee on

the classification and diagnostic criteria of diabetes mellitus

Diabetes Research and Clinical Practice,(2002): 55 (1): 65-85

12. Beckman JA, Creager MA, Libby P Diabetes and atherosclerosis: epidemiology,
pathophysiology, and management (25) JAMA. (2002) May 15;287(19):2570-81.
13. Booth GL, Kapral MK, Fung K, Tu JV. Relation between age and cardiovascular disease
in men and women with diabetes compared with non-diabetic people: a population-based
retrospective cohort study. Lancet. (2006). Jul 1;368(9529):29-36

14. Mohan D, Raj D, Shanthirani CS, Datta M, Unwin NC, Kapur A Mohan V. Awareness
and knowledge of diabetes in Chennai--the Chennai Urban Rural Epidemiology Study
[CURES-9]. Journal of Association of Physicians of India.(2005). 53:283-287.) Accessed on
20

15 . Pedersen,O. Multifactorial intervention and cardiovascular disease in patients with type 2
diabetes. The new England Journal of Medicine. 348 393-383 : (5) .Available on :(2003)

16 .Yusuf S, Sleight P, Pogue J, Bosch J, Davies R, Dagenais G. Effects of an angiotensin-
converting-enzyme inhibitor, ramipril, on cardiovascular events in high risk patients. The
Heart Outcomes Prevention Evaluation Study Investigators. *NEJM(* 2000);342:145-153.

17. Amos AF, McCarty DJ, Zimmet P. The rising global burden of diabetes and its
complications: estimates and projections to the year 2010. Diabet Med. (1997); 14 (suppl 5):
S1–S85.

18 . Mokdad AH, Bowman BA, Ford ES, et al. The continuing epidemics of obesity and
diabetes in the United States. JAMA.(2001); 286: 1195–1200.
19. Bosnyak Z, Nishimura R, Hagan Hughes M,et al. Excess mortality in black compared
with white patients with type 1 diabetes: an examination
of underlying causes. Diabet Med(2005); 22:1636–1641
20. Walsh MG, Zgibor J, Borch-Johnsen K,Orchard TJ; DiaComp Investigators. A
multinational assessment of complications in type 1 diabetes: the DiaMond substudy of
complications (DiaComp) level 1. Diab Vasc Dis Res (2006);3:84–92.

21. Hoogeven EK, Kostense PJ, Jakobs C, et al. Hyperhomocysteinemia increases risk of death, especially in type 2 diabetes. Five-year follow-up of the Hoorn Study. *Circulation* .(2000);**101**:1506-1511.
.

22. Wang, Z & Hoy, E.W. Association between diabetes and
coronary heart disease in Aboriginal people: are women disadvantaged?
The Medical Journal of Australia.(2004) .180 (10): 508-511.

23. Almdal, T., Scharling, H., Jensen, J.S & Vestergaard, H. The Independent Effect of Type 2 Diabetes Mellitus on Ischemic Heart
Disease, Stroke, and Death. *Archives of Internal Medicine*.(2004) .164(13):1422-
1426.

24. D'Agostino RB, Russell MW, Huse DM, et al. Primary and subsequent coronary risk appraisal: new results from the Framingham Study. *Am Heart J* 2000;139:272-281.

25. Goldberg RA. Cardiovascular disease in diabetic patients. *Med Clin North Am* 2000;84:81-93.

26.   Ridderstråle, M., Gudbjörnsdottir, S., Eliasson, B., Nilsson, P.M &
Cederholm, J. Obesity and cardiovascular risk factors in type 2
diabetes: results from the Swedish National Diabetes Register. *Journal of
Internal Medicine* .(2006): *259*(3):314-22.

27. RR Kasliwal, A Kulshreshtha, Sweta Agrawal, M Bansal, N Trehan. Prevalence of Cardiovascular Risk Factors in Indian Patients Undergoing Coronary Artery Bypass Surgery .(2006):54:(371-375)