

Study Role of Gender and Clinical Chemistry Data in Type 2 Diabetes Mellitus Patients

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Abstract

Diabetes mellitus will be a ceaseless malady described toward hyperglycemia normally effects from a passing about insulin response handling β phones in the pancreas prompting a lack for insulin response (type 1 diabetes) or reduction of insulin response affectability. Kind 2 diabetes (T2D) makes dependent upon about 85-90% of all cases. It happens for those reality anyway its regular in the created nations particularly kind 2. However happening to creating nations in Asia and Africa, the place a large portion of patients will presumably have a chance to be discovered by 2030 organize of the pancreas improvement. For Egypt the weight particularly visceral adiposity furthermore physical movement would real danger figures to diabetes. There need aid half for Egyptian men furthermore 65 - 80% about Egyptian ladies are overweight.

1. Introduction

Diabetes mellitus (DM) will be an aggregation from claiming metabolic infection for which the blood glucose level is raised coming about because of abandon for insulin response emission, insulin response movement or both. DM may be connected with long expression harm, brokenness. What's more disappointment of huge numbers of organs particularly the eyes, kidney, nerves, heart furthermore vein [1]. Those indications of checked hyperglycaemia incorporate polyuria, polydipsia, weight misfortune, polyphagia, smeared dream. What's more defenselessness should infections. The in length haul difficulties for diabetes incorporate retinopathy, nephropathy, fringe neuropathy with hazard from claiming foot ulcers, amputations. What's more Charcot joint [2]. Those patients with diabetes have an expanded occurrence of atherosclerotic cardiovascular, fringe blood vessel furthermore cerebrovascular malady [3]. Kind 2 diabetes (T2D) makes dependent upon about 85-90% of all cases. It happens all around those reality be that its basic in the created nations particularly kind 2. However happening to creating nations over Asia also Africa, the place the greater part of patients will most likely have a chance to be discovered toward 2030 [4]. Those expansion done frequency in creating nations takes after the pattern about urbanization and lifestyle transforms. Including inactive lifestyle, lessquerella physically requesting fill in also worldwide sustenance transition, checked by expanded admission complex from claiming sustenance that need aid helper skelter to sugar fruit and immersed fats. Be that poorly supplement. The danger from claiming getting sort 2 diabetes mellitus need be broadly discovered on make connected with easier socio-investment nations [5]. In Egypt the corpulence particularly visceral adiposity. What's more physical movement are significant danger figures to diabetes. There need aid half of Egyptian men and 65 - 80% from claiming Egyptian ladies are overweight, [6]. The WHO reports show that 30.3% of the Egyptian mature people are large. Egypt need those third most astounding pervasiveness for corpulence then afterward Saudi Arabia. What's more united Middle Easterner emirates in the center east district. The corpulence connected with the danger of diabetes. What's more cardiovascular illnesses [7]. The physical inertia is an additional significant

hazard figure for the advancement for T2D in Egypt. The review clinched alongside 2015 which incorporate the patients with unending malady for example, diabetes [8].

2. Subject and method

Those investigation might have been led at the inward drug and clinical pathology divisions from claiming Benha school healing centers from June 2017 should April 2018 on 40 patients for kind 2 diabetes mellitus. Also 10 clearly solid subjects serving concerning illustration control.

2.1 Patients groups

1) Group 1:

It included 20 patients of type 2 diabetes without complication (13 males and 7 females), with age range from 38-62 years.

2) Group 2:

It include 20 patients of type 2 diabetes with microvascular or macrovascular complications (14 males and 6 females) with age range from (42-70) years.

3) Control Group:

It include 10 apparently healthy persons (6 males, 4 females) with age range from (35-58) years.

2.2 Analytical methods

1- Blood glucose level

The analysis was done using Biosystem A15 auto analyzer applying glucose enzymatic colorimetric method. In this method oxidation occurs in the presence of glucose oxidase [11].

Range: fasting 70 - 110 mg/dL

Post prandial up to 140 mg/dL

2- Serum urea

Principle

Urea in the sample is measured by means of coupled reaction. The colored complex can be measured spectrophotometrically [12]. The analysis was done by using Urea/BUN - Color BioSystems reagent kit provided by BioSystems A15 auto analyzer/

Total Cholesterol (TC)

Total cholesterol was assayed on Biosystem A15 auto-analyzer applying colorimetric method. In this method, cholesterol esterase (CE) hydrolyzes cholesterol

esters to free cholesterol and fatty acid and the color was measured at 546 nm [14].

Aspartate transaminase (AST)

The examination might have been done utilizing Biosystem A15 auto-analyzer applying dynamic technique. The amino corrosive will be enzymatically exchanged by AST exhibit in the example from aspartate of the carbon particle for 2-oxaloglutarate yielding oxaloacetate Also L-glutamate. Those reactant centralization is decided from those rate for diminished absorbance In 340 nm because of change from claiming NADH should nad by malate dehydrogenase coupled response [15].

3. Statistical analysis

The collected data were 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.

Descriptive statistics

- 1- Mean, standard deviation (± SD) for parametric numerical data, while Median and range for non-parametric numerical data.
- 2- Frequency and percentage of non-numerical data.
- 3- Shapiro test was done to test the normality of data distribution.

Significant data was considered to be nonparametric.

Analytical statistics

Student T Test was used to assess the statistical significance of the difference between two study group means.

Mann Whitney Test (U test) was used to assess the statistical significance of the difference of a non-parametric variable between two study groups.

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.

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.

Regression analysis: Logistic and ordinal regression analyses was use for prediction of risk factors.

Analytical statistics

- P value <0.05 was considered statistically significant (S) in all analyses.
- P value <0.001 was considered highly significant (HS) in all analyses.

4. Results

The present study was conducted on 40 T2DM patients. Their mean age was 53.6 years, they were 27 males (67.5%) and 13 females (32.5%). In addition to 10 healthy control subjects of matched age and gender.

Table (1) Comparison of gender distribution according to cut off value obtained by ROC curve in T2DM group.

T2DM	Below cut off		Above cut off		P
	N=15		N=45		
	Mean	SD	Mean	SD	
	N	%	N	%	
Male	12	80	15	33.3	.298
Female	3	20	10	22.2	

SD, standard deviation; age is compared by t test; gender is compared by Fisher exact test. No significant differences were found in gender distribution according to cut off value obtained by ROC curve in T2DM group.

Table (2) Comparison of anthropometric measures, blood pressure and family history between all studied groups.

Group	Control		T2DM	T2DM Without complication	T2DM With complications	P1	P2
	N=10		N=40	N=20	N=20		
	mean±SD	mean±SD	mean±SD	mean±SD			
Weight (kg)	71.5±7.2	93.6±12.4	95.8±14.9	91.±9.1	<0.001H.S	0.263	
Height (cm)	165±7	166.6±6.9	167±6.5	166.1±7.5	0.531	0.687	
BMI (kg/m ²)	23.1±6.6	33.6±4.2	34±5.1	33.2±3.2	<0.001 H.S	0.536	
SBP (mmHg)	121.5±7.5	140±16	142±18.3	138±13.5	<0.001 H.S	0.437	
DBP (mmHg)	77.5±6.8	88.1±8.6	88.8±7.6	87.5±9.7	<0.001 H.S	0.652	
	N	%	N	%	N	%	

P1, comparison between T2DM and control groups.

P2, comparison between T2DM with and without complications.

BMI, body mass index.

SBP, systolic blood pressure.

DBP, diastolic blood pressure.

In the present study we found that weight, BMI ,SBP ,DBP and family history in T2DM cases were highly significant when compared to control group ($p < 0.001$).

Table (3) Laboratory investigations for all studied groups.

Group	Control	T2DM	T2DM Without complications	T2DM With complications	P1	P2
	N=10	N=40	N=20	N=20		
	Mean ±SD	mean ±SD	mean ±SD	mean ±SD		
2hPPBG (mg/dL)	100.5±10.3	259.6±57.9	262.7±47.2	256.5±68	<0.001 H.S	.737
FBG(mg/dL)	126±20.1	204.5±50.1	197.1±53.6	211.9±46.6	<0.001 H.S	.358
Urea (mg/dL)	28.6±2.2	43.2±13.8	36.4±11.5	50.1±16.7	<.054 S	.349
AST (U/L)	31±3.8	34.8±5.7	33.5±4.9	36.2±6.2	.051 S	.129

P1, comparison between T2DM and control groups.

P2, comparison between T2 DM with and without complications.

TG, triglycerides. TC, total cholesterol. HDL, high density lipoprotein.

LDL, low density lipoprotein. FBG, fasting blood glucose. 2h PPBG.

2 hours postprandial blood glucose. HbA1c hemoglobin A1C.

5. Discussion

Diabetes mellitus (DM) is a complex, chronic disease characterized by hyperglycemia. It has become a standout amongst the major tests on worldwide health. DM is requiring nonstop consideration for multi factorial risk-reduction methodologies Past glycemic control [1].

There are two major sorts about dm. Kind 1 diabetes (T1DM) coming about because of immune system decimation from claiming insulin response generating β . Cell prompting outright insulin response insufficiency What's more type 2 diabetes (T2DM) because of insulin response safety Also progressive passing from claiming β . Cell insulin response emission [22]. Kind 2 diabetes mellitus may be a genuine What's more basic unending illness coming about because of an intricate about inheritance, earth connection alongside different danger figures for example, such that Weight Furthermore inactive life style. T2DM Also its difficulties constitute An major overall government funded wellbeing issue influencing Practically know populaces Previously, both created Also creating nations. Egypt need been recorded "around the universe highest point 10 nations on the amount of patients for diabetes [18].

Those diabetic difficulties would answerable for much about its connected horribleness and mortal sin. Those hazard for improvement of diabetic difficulties expansion for poor glycemic control and malady span. DM need microvascular muddling incorporate nephropathy, retinopathy, neuropathy Also macrovascular muddling for example, such that coronary alternately fringe vascular muddling [15]. Those introduce ponder might have been led at the clinical and compound pathology section about Benha college healing center and the subjects selected in this study were recruited from inward drug section. Those investigation incorporated 40 patients with sort 2 diabetes. Their intend agdistis might have been 53. 6

quite some time. They were 27 male (67. 5%) What's more 13 female (32. 5%) furthermore on 10 clearly sound control subjects for matched agdistis Furthermore sex.

The patients were further subdivided under two groups, assembly I which included 20 diabetic patients without difficulties Furthermore bunch II included 20 diabetic patients with difficulties.

Those effects of the available worth of effort indicated no huge Contrast about sex appropriation "around the concentrated on gatherings.

These effects were concurred with discoveries for [13] who demonstrated that the period Also sex exhibited no huge variety Around diabetic aggregations contrasted with typical populace.

In this consider those weight What's more BMI were Exceedingly fundamentally expanded clinched alongside T2DM patients contrasted with control assembly. This outcome might have been in understanding with [21] who demonstrated that there might have been a statistically critical build in BMI clinched alongside diabetic patients more than control assembly. In any case [19] showed that there might have been not noteworthy distinction Previously, BMI between T2DM cases What's more control Assemblies.

We discovered that there were statistically critical contrasts the middle of T2DM Also control assembly in regards to 2 hour post prandial. The effects about 2hour post prandial blood glucose Around the concentrated on gatherings were in understanding for. Those outcomes of the available fill in demonstrated that tce might have been altogether higher in the diabetic gatherings contrasted with control assembly. Tce might have been fundamentally expanded in the diabetic one assembly contrasted with control bunch. The consequence might have been in understanding who exhibited altogether

expanded level of tce clinched alongside diabetic patients contrasted with control gathering.

This study demonstrated that serum urea might have been statistically huge clinched alongside dm patients when contrasted with control one assembly. The outcome might have been in understanding for. We found that AST were statistically noteworthy for dm patients The point when contrasted with control one assembly. This aftereffect might have been in understanding for who discovered that patients with T2DM have insulin response safety that prompts liver brokenness.

References

- [1] American Diabetes Associations.Report of the expert committee on the diagnosis and classifications of Diabetes Mellitus. *Diabetes care*, vol.30(7), PP.1183-1197, 2017.
- [2] M.Bullo, P.Casas-Agustench, P.Amigo-correig.Information, obesity and morbidities: the role of diet *Public Health Nutrition*, vol.10(10), PP.1164-1176, 2007.
- [3] K.A.DAmour . Production of pancreatic hormone expressing endocrine cells from human embryoni stem cells. *Nat. Biotechnol*, vol. 24, PP.1392-1401 , 2006.
- [4] World Health Organization.Global report on diabetes Geneva. *Diabetic care*, vol. 39, PP.85-92, 2016.
- [5] H,Agard. Diabetes incidence and Socio-economic position: asymmetric review and meta-analysis. *Internal journal*, vol.40(1) , PP. 11-17, 2011.
- [6] El-Zanaty.A way Egypt Demographic and Health survey. Ministry Of health, El-Zanaty. *Macro international*, cairo; Egypt , vol.2(15), PP.142-158,2009.
- [7] M.Ibrahim and A.Elamraghy.Cut off values of waist circumference, associated cardiovascular risk in Egyptians. *BMC Cardio Disorder*, vol.14(21), PP.11-53, 2011.
- [8] Ghandour.Out of pocket expenditure on non-communicable disease among Egyptian patients. *Egyptian J Hos Med*, vol.2 (58) , PP.55-62, 2015.
- [9] C.A.Burits, E.R.Ashwood and D.E.Bruns. Tietz textbook of clinical chemistry and moleculat diagnostic 4th ed. Washinton: WBSaunders Co, Vol.8(14), PP.1145-1467 , 2005.
- [10] American Diabetes Association. Classification and diagnosis of Diabetes Mellitus. *Diabetes care*, Vol.39(1), PP.11-63, 2016.
- [11] M.Carroll and E.Yeomans. Diagnosis of diabetic ketoacidosis. *Crit.careMed*, vol.33(10), PP.347-353, 2015.
- [12] C.A.Burtis, E.R.Ashwood and Burns. Diabetes mellitus in Teitz text book of clinical chemistry and molecular genetics 5th edition. Elsevier Health sciences , Vol.25(2), PP.853-901, 2012.
- [13] A.L.Chaneyand E.P.Marbach.:Modified reagents for determination of urea and ammonia. *Clin Chem*, vol. 8 , PP.130-132,1962.
- [14] C.C.Allanin, L.S.ZPoon, C.S.G.Chan . Enzymatic determination of total cholesterol. *Clin Chem*, Vol. 20, PP.470-475, 1974.
- [15] F.J.Gella, T.Olivella, P.M.Cruz. A simple procedure for routine determination of aspartate aminotransferase and alanine aminotransferase with pyridoxal phosphate.*Clin Chem Acta*, vol. 153, PP.241-247, 1985.
- [16] Dwivedi and P.D.Sarkar.Oxidative stress with homo cysteine Lipoprotein A and lipid profile in diabetic nephropathy. *International Journal of Applied Biology and Pharmaceutical Technology*, vol. 1(3), PP.840-844, 2010.
- [17] S. Hadj, R.Belloum, B.Bouhanick . Prognostic value of the angiotensin-1 converting Enzyme in type 2 diabetes: a prospective study. *J.Am.Soc .Nephrol* , Vol.12, PP.541-549, 2001.
- [18] H.R.Jain, V.Shetty, G.S.Singh . A study of lipid profile in Diabetes Mellitus. *International Journal of scientific study*, vol.4(9), PP. 56-61, 2016.
- [19] E.H.Jiffer. Relationship between lipid profile blood and thyroid hormones im patient with type 2 diabetes mellitus. *Adv obese weight manag control*, vol.6 (6), PP.178-182, 2017.
- [20] S.H.Ko, M.K.Baeg, K.D.Han . Increased liver markers are associated with high risks of type 2 diabetes.*World Journal of Gastroenterology*, Vol.21, PP.7478-7487, 2015.
- [21] M.Masahhit, H.A.Husain and R.Samir. Pattern of Dyslipidemia in Type 2 Diabetic patients in Fayoum (Egypt). *Asian Journal of medicine and health*, vol.8 (1), PP.1-12,2017.
- [22] S.Wang, W.Ma, Z.Yuan, . Association between obesity indices and type 2 diabetes mellitus among middle-aged and elderly people in Jinan, China: a cross-sectional study. *BMJ*, Vol.6(11), PP.012 748, 2016.