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Prevalence of D.M among medical students in Mu'tah university, Al- Karak, Jordan

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Abstract

Diabetes mellitus is a rapidly growing health concern and it was the 9th leading cause of death worldwide in 2019. Jordan has a relatively high prevalence of diabetes mellitus (DM), and several national population-based epidemiological surveys have been conducted suggesting the rapidly growing prevalence of DM in Jordan.

This study was conducted to determine the prevalence of diabetes mellitus among medical students at Mutah school of medicine in Al-Karak in Jordan.

A total of 350 medical students were enrolled in this observational study. The prevalence of diabetes mellitus proved to be 2.3 % (7 students) of participants (14.3% females and 85.7% males, p=0.002).

About 85.7% of diabetic student (57.1% type1 and 42.4% type2) and 45.5% of the non-diabetic students show a family history of DM. The present study shows that 34.5% of the students have an over body mass index, 2.0% of them were diabetics. (P = 0, 04). hence there is no significant relationship between BMI and DM.

It was found that 28.6% of diabetic students having HbA1c (7-10 gm %) with a p value =0,001.

Moreover, it was found that 50% of diabetic students have skin rash, hypertension and eye complications.

Also, there is a history of hyperglycemic coma was reported in 14.3% of diabetic students and hypoglycemic coma 14.3% of diabetic students.

Keywords: Diabetes Mellitus; Medical Students; Al-Karak; Jordan

1 Introduction

Diabetes mellitus is a disorder of carbohydrates metabolism, caused by relative or absolute deficiency of insulin, hyperglycemia and end organ complications.

The rising prevalence of diabetes mellitus is due to the effect of modifiable risk factors like smoking, bad eating habits predisposing to dyslipidemia, obesity (characterized by Body mass index BMI>30kg/m^2) and a lack of physical activity, and other non-modifiable risk factors like family history, age, gender and race.

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The International Diabetes Federation has anticipated that the number of diabetic patients will increase to 380 million in 2025, and will finally increase to 439 million in 2030

It is a rapidly growing health concern and it was the 9th leading cause of death worldwide in 2019.

Jordan has a relatively high prevalence of DM, and several national population-based epidemiological surveys have been conducted suggesting the rapidly growing prevalence of DM in Jordan, as it has been predicted to reach almost 50% in 2050 with a current percentage of 20% diabetic patients and 20% other pre diabetic patients.

However, we recognized the significance of performing this study on medical students at Mutah University which is located in the south of Jordan in order to identify the connection between the incidence of DM and modifiable risk factors amongst this group of people in this region because no data on this topic is currently available, and it is evidenced that understanding the epidemiology of diabetes mellitus is critical for determining healthcare priorities and understanding the role of modifying modifiable risk factors to prevent further progression of prediabetic patients into confirmed diabetic cases.

This study was conducted to determine the prevalence of diabetes mellitus among medical students at Mutah University in Al-Karak in Jordan, raising the awareness about its complication and to spot light problems encountered by student to get their proper support treatment

2 Material and methods

A total of 350 medical students were enrolled in this observational study, (i.e., 67.5% females and 32.5% males) were investigated using a questionnaire designed for medical students from 1st up to 6th year. Statistical analysis was performed using SPSS version 25.

3 Results

The prevalence of diabetes mellitus proved to be 2.3 % (7 students) of participants (14.3% females and 85.7% males, p=0.002). About 85.7% of diabetic student (57.1% type1 and 42.4% type2) and 45.5% of the non-diabetic students show a family history of DM.

Table 1 Sample size and gender distribution

Sample size	**304 students out of 2519 students (12%)**	
Gender	Females	207 participants (68.1%)
	Males	97% participants (31.9%)

Sample size was 304 students, with a mean age of 20.09. A gender split of 68.1% female (n=207) and 31.9% male (n=97). Students in the basic years (first to third) Participated at a higher rate than students in the clinical years, and most of them were first year students.

Table 2 Family history of DM in diabetic and non-diabetic students

			Family history		
			Yes	**No**	**Total**
Diagnosed	Yes	Count	6	1	7
		% within Diagnosed	85.7%	14.3%	100.0%
	No	Count	135	162	297
		% within Diagnosed	45.5%	54.5%	100.0%
Total		Count	141	163	304
		% within Diagnosed	46.4%	53.6%	100.0%

It was found that there is no remarkable relation between smoking (p value =o, 188), physical activity (p value =0,139), eating healthy food (p value =0,346) and diagnosed diabetic students.

Table 3 BMI among students

			+ve DM	**-ve DM**	**Total**
BMI	Normal	Count	1	198	199
		% within BMI	0.5%	99.5%	100%
		% Within diagnosed	14.3%	66.7%	81.0%
		% of Total	0.3%	65.1%	65.4%
	Over	Count	6	99	105
		% within BMI	5.7%	94.3%	100%
		% Within diagnosed	85.7%	33.3%	34.5%
		% of Total	2%	32.6%	34.5%
Total		Count	7	297	304
		% within BMI	2.3%	97.7%	100%
		% within diagnosed	100%	100%	100%
		% of total	2.3%	97.7%	100%

*BMC: body mass index class ; **Over body mass index ≥24.9 according to the WHO

Table 3 shows BMI among students.

It was found that 34.5% of the students have an over body mass index**, 2.0% of them were diabetics. (P = 0, 04)

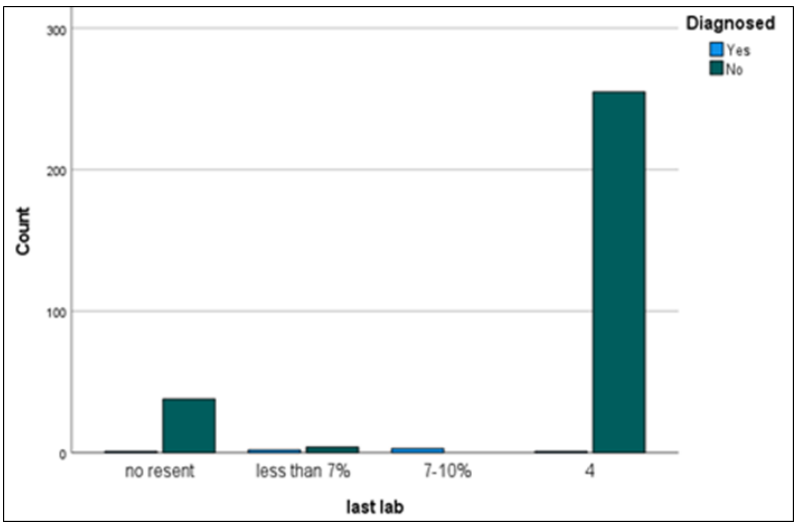

Figure 1 HbA1c levels of the diabetic students

It was found that 28.6% of diabetic students having HbA1c (7-10 gm %) with a p value =0,001

It was found that 50% of diabetic students have skin rash, hypertention and eye complications.

Also, there is a history of hyperglycaemic coma was reported in 14.3% of diabetic students and hypoglycaemic coma 14.3% of diabetic studente .

Uncontrolled diabetes mellitus D.M treatment in 57.1% of diabetic students in which half of them had financial problems and the other half had difficulty finding the drugs in the market.

4 Discussion

4.1 Genetics

Family history represents a strong predictor of diabetic prevalence among medical students in Mutah university, it is found that 85.7%(57.1% type1, 42, 4% type 2) of diabetic students have a family history of DM, while 95.7% of the non-diabetic students have a family history of DM, these students are more likely to get diabetes as compared to students who don't have a positive family history. As found in (Vera K. Tsenkova ,2016) 1 research there is a significant interaction between positive affect and parental history of diabetes on diabetes (p=.009) , the fact that DM-1 is most commonly diagnosed diabetes in youth (under 20 years) explains why the percentage of dm-1patients in this age group is higher than dm-2 , nevertheless the dm-2 percentage is relatively considered high in our results ,as there is a plenty of factors playing role with increasing risk of dm2 in this age group such as obesity and inactive life style . Moreover, dm-2 is more related to genetics and is diagnosed in advanced age. , that explains why our results show most of students with positive family history are not diagnosed with DM yet.

4.2 Gender

As we found in our study, 2.3% (7 students) were diagnosed with DM. Female prevalence (14.3%) is less than male prevalence (85.7%). according to (Male predominance of type 1 (insulin-dependent) diabetes mellitus in young adults: results from a 5-year prospective nationwide study of the 15-34-year age group in Sweden) research a male predominance was found in all age groups, with a male-to-female ratio of 1.8:1 for Type 1 diabetes and 1.3:1 for Type 2 diabetes2. As best of our knowledge, gender itself is not a risk factor for DM unless it is associated with other factors such as physical inactivity, smoking, alcohol consumption. On the contrary (Anna Nordström et al. 2016) 3 shows that in recent years, male sex has been regarded as a risk factor for the development of type 2 diabetes. As we found in many studies 4, 5, men are more prone than women to the development of this disease due to having larger amounts of visceral fat, as having more visceral fat is strongly linked to having a higher risk of metabolic syndrome, including type 2 diabetes. While the present finding of a marked male predominance after puberty in Type 1 diabetes in an ethnically quite homogeneous population supports the hypothesis that environmental risk factors and life-style are important for the development of the disease 6

4.3 BMI

In addition, our study shows that 34.5% of the students have an over body mass index, 2.0% of them were diabetics. (P = 0, 04). Hence there is no significant relationship between BMI and DM. However, Insulin resistance is linked with obesity, which is a pathophysiologic factor of type 2 diabetes mellitus 7. As best of our knowledge there is no relation between BMI and the diagnosis of dm1 which explains why there is no significant relation between BMI and DM in our study since the majority of our DM population is diagnosed with type1.

4.4 HB_{A1C} and complications

HB_{A1C} was (7-10%) among 6.3% of our DM students ,50% of them have a skin rash, HTN and eye complications. with a p value of 0.001, so there is significant relation between hba1c level and complications. as found in (S Zoungas et al.2012) 8 there is evidence of HBA1C (threshold) of 7.0% for macro vascular events and 6.5% for micro vascular events, above these thresholds the risks increase significantly: every 1% higher HBA1C level was associated with a 38% higher risk of a macro vascular event, a40% higher risk of a micro vascular event and a 38% higher risk of death (all p<0.0001) . Also, our research showed that, there is a history of hyperglycemic coma proved to be 14.3%(one of diabetic students), and this is most probably due to uncontrolled dm as shown in (Deborah Weatherspoon 2019) 9 which states that hyperglycemic hyperosmolar syndrome without treatment can be life threatening and lead to severe dehydration and possibly coma. Hypoglycemia is another complication we encountered in (14.3%) among affected students in our study and according to Richard Silbert, Alejandro Salcido-Montenegro, and Rozalina G. McCoy, the hypoglycemia risk factors are fasting, whether planned or unplanned. Continuing to take glucose-lowering medications while fasting for medical test or procedures.

This study shows that 57.1% of diabetic students have uncontrolled DM, due to poor compliance to treatment, in which half of them had financial problems and the other half had difficulty finding the drugs in the market.

5 Conclusion

We could conclude that prevalence of diabetes mellitus proved to be 2.3 % (7 students) of participants (14.3% females and 85.7% males, p=0.002). Moreover, 57.1% of diabetic students have uncontrolled diabetes mellitus (DM), due to

poor compliance to treatment, in which half of them had financial problems and the other half had difficulty finding the drugs in the market. It is advisable to raise awareness among students to do routine medical chick- up periodically to alleviate diabetic complication.

Compliance with ethical standards

Acknowledgments

We acknowledge Mutah school of medicine for approving our research among the students from 1st up to 6th year.

Disclosure of conflict of interest

No conflict of interest is present in the present research authors.

Statement of ethical approval

The present research work does not contain any studies performed on animals/humans subjects by any of the authors.

Statement of informed consent

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

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