

## Alcohol and glycemic control in patients with diabetes mellitus



### Medicine

**KEYWORDS:** diabetes mellitus, alcohol, Tabasco, Mexico.

**Carmen Carolina Sánchez Fernández**

Student of sixth semester. Bachelor's degree in Medicine. University of Valley of Mexico, Campus Villahermosa

**Vanessa Pérez De La Cruz**

Student of sixth semester. Bachelor's degree in Medicine. University of Valley of Mexico, Campus Villahermosa

**Dr. Edgar Garcia Rojas**

Master of Science In Public Health. Full time research academic. University of Valley of Mexico

**Dr. Marco Antonio Serrano Rivera**

Population Health Specialist. Coordinator of the Degree in Medicine. University of Valley of Mexico, Campus Villahermosa

### ABSTRACT

**Objective:** To determine the consumption of alcohol as a factor in the decontrol of glucose in patients with diabetes mellitus. **Methods:** An observational, analytical, cross-sectional, prospective study was carried out in patients attending the "Luis Gil Pérez" expanded health center in Centro, Tabasco, Mexico, in May 2016, using non-probabilistic sampling for convenience, ( $P > 0.05$ ). **Results:** 23.07% of the patients were normoglycemic, four positive cases were found in glycemic control and alcohol intake without significant relation ( $p > 0.05$ ). Alcohol intake and diabetes mellitus remain a major public health issue.

### Introduction

Diabetes mellitus is a chronic degenerative disease that causes thousands of deaths in Mexico; for 2009 the highest costs were cabinet studies (\$ 4,904, DE = \$ 7,023) and cost for day-bed (\$ 3,524, DE = \$ 3,910), with an average total of \$ 13,555. (Escobedo de la Peña, y otros, 2011).

Among its complications is diabetic retinopathy with risk of Hb1Ac > 7%, > 5 years of disease, pregnancy, lighth density lipoprotein > 100 mg/dl, hypertension, obesity (BMI  $\geq 30$  kg/m<sup>2</sup>), creatinine clearance < 60 mg/min, albuminuria (> 30mg/g); distal diabetic polyneuropathy (Castro Cárdenas, López Dorta, Rodríguez Rivero, Suárez Pérez, & Llerena), where the decompensation of severe hyperglycemia leads to a non-cetostean hyperglycemic hyperosmolar state, diabetic ketoacidosis (Yepez, Garcia, & Toledo, 2012). In gestational diabetes, uncontrol must be related to maternal components. (Jiménez Cruz, Ortega Cisneros, & Bacardí Gascón, 2014), (Márquez Guillén, Lang Prieto, Valdés Amador, Cruz Hernández, & Guerrero Rodríguez, 2011).

Associating cases of diabetic retinopathy with insulin use ( $p=0.06$ ) and diabetic maculopathy ( $p=0.019$ ) compared to oral. (Jingi, y otros, 2016).

In a cohort of 58717 patients, alcohol intake was high (36%) who were enrolled in type II diabetes mellitus, compared to type I. (McGovern, y otros, 2016).

The objective of this study was to determine the ingestion of alcohol associated with the glycemic control in patients with diabetes mellitus II of the "Luis Gil Pérez" expanded health center in Centro, Tabasco, Mexico.

### Methodology

#### Study design

An observational, analytical, cross-sectional, prospective study was performed in patients attending an expanded health center "Luis Gil Pérez", in Centro, Tabasco, Mexico, in May, 2016.

#### Universe shows and sampling

The universe was constituted by patients who go to the health center, through non-probabilistic sampling for convenience.

#### Selection criteria

**Inclusion:** patients with diabetes mellitus. **Exclusion:** subjects under 18 years of age, pregnant with gestational diabetes. **Elimination:** patients with change of address, who do not wish to participate in the study

#### Data collection plan

It was carried out by means of a data collection instrument which consisted of a 14-item questionnaire where the body mass index (BMI) was assessed considering as normopesm < 25.0, overweight 25.0-29.9, obesity > 30; alcohol intake during the week. In relation to capillary glucose was taken with a digital glucometer acuchek® brand being elevated those with  $\geq 110$  mg/dl.

#### Statistical analysis plan

Data were processed and analyzed using Microsoft Excel®, SPSS® v23. Student's t-test and fisher's exact test were used, accepting a  $p \leq 0.05$ .

#### Ethical Considerations

The present study consisted of determining the relationship of alcohol intake and glucose decontrol, according to the General Health Law Title Fifth Article 99 (Secretaria, 2016), The participants signed prior informed consent. The project was approved by the ethics and research committee of the University of Valley of México Campus Villahermosa.

#### Results

In relation to gender, the male was 85% and the female 15% in a total of 13 people aged  $45 \pm 5.4$  years and a body mass index of  $28.2 \pm 5.4$  kg.

In relation to the data obtained, seven diabetic patients consumed alcohol weighing  $74 \pm 14.083$  kg and BMI of  $28.05 \pm 5.754$  and six without intake  $69.92 \pm 21.644$  kg, BMI of  $30.57 \pm 6.774$ , with no statistically significant relationship. Table 1

Table 1. Relationship of alcohol with values of weight and body mass index

	Alcohol intake		p*
	Yes	No	
Weight (kg)	$74 \pm 14.08$	$69.92 \pm 21.64$	0.690
BMI (kg/m <sup>2</sup> )	$28.05 \pm 5.75$	$30.57 \pm 6.64$	0.483

\* Student t test

Source: Alcohol and glycemic control in patients with diabetes mellitus

Four cases with alcohol intake and glycemic control were found, with no significant association ( $p=0.559$ ; 95% CI=0.0195-3.65) Table 2.

Table 2. Relationship of alcohol with glucose decontrol

	Alcohol intake				
	Yes	No	p*	OR	95% CI
Glucose $\geq 110$ mg/dl	4	5	0.559	0.26	(0.0195-3.65)
$\leq 110$ mg/dl	3	1			

\*Exact fisher test

Source: Alcohol and glycemic control in patients with diabetes mellitus

## Discussion

In a sample of 15 patients at the University Hospital of the Faculty of Medicine in Jundiá, São Paulo, Brazil, the alteration of collagen in the cremaster muscle secondary to tobacco-alcohol and diabetes mellitus was analyzed in the healthy control group ( $n=5$ ) with protein values of  $2.17 \pm 3.12$  (mg/dl), with tobacco-alcohol intake ( $n=5$ ),  $9.58 \pm 5.78$  and diabetes ( $n=5$ )  $10.36 \pm 6.26$  mg/dl, denoting ( $p < 0.05$ ), as well as a reduction of muscle cells in comparison to the control ( $p < 0.05$ ).

The incidence of metabolic syndrome is related to increased waist circumference ( $p=0.000$ ), blood pressure greater than 130/85 mmHg ( $p=0.03$ ), as well as fasting glucose ( $p=0.000$ ). Compared with our results, weight and BMI were below those who did not consume alcohol, with no significant association ( $p > 0.05$ ).

Zhu et al. (2017) data in a metaanalysis association of alcohol consumption as risk for diabetic retinopathy, denotes that this has been measurable as positive those with four-week intake, dichotomous nominal variable, as well as grams of intake a week; Without finding a significant association between them. ; being of great interest the physical activity, those of free time associated with the evaluation of the homeostatic model of resistances to the insulin ( $p < 0.05$ ), in patients with diabetes. Compared to our results, only four cases were reported, suggesting alcohol intake during the week, with no significant relation ( $p > 0.05$ , 95%CI= 0.0195-3.65).

## Conclusion

Alcohol intake continues to be a controversial issue, being on the one hand alluded as a risk factor for comorbidities such as metabolic uncontrol in diabetes mellitus, arterial hypertension. However, there are meta-analyses that support a certain cardioprotective effect, no significant association was found in this study, being it possible to consider increasing the sample to be studied.

## References

- Escobedo de la Peña, J., Buitrón Granados, L. V., Ramírez Martínez, J., Chavira Mejía, R., Schargrodsky, H., & Marcet Champagne, B. (2011). Diabetes en México. Estudio CARMELA. *Cirugía y Cirujanos*, 79, 424-431.
- Castro Cárdenas, K., López Dorta, N., Rodríguez Rivero, D., Suárez Pérez, J. C., & Llerena Rodríguez, J. A. (2013). Factores de riesgo y severidad de la retinopatía diabética. *Revista Cubana de Medicina Militar*, 42(2), 181-190.
- Chobanian, A., Bakris, G., Black, H., Cushman, W., Green, L., Izzo, J., & Jones, D. (2004). Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. United States: The Seventh Report of the Joint National Committee.
- Ferreira Modena, S., Caldeira, E. J., Peres, M. A., & Andreollo, N. A. (2016). Influyente de tobacco, alcohol and diabetes on the collagen of cremaster muscle in patients with inguinal hernias. *Arquivos Brasileiros de Cirurgia Digestiva*, 29(4), 218-222.
- Guang Yi, L., Zi Bo, L., Fang, L., Li Ping, D., Liang, T., Ju, X., ... Mei Hua, B. (2017). Meta-Analysis on the Association of ALDH2 6.Polymorphisms and Type 2 Diabetic Mellitus, Diabetic Retinopathy. *International Journal of Environmental Research and Public Health*, 14(165), 1-11.
- Jiménez Cruz, A., Ortega Cisneros, A., & Bacardí Gascón, M. (2014). Efecto de la diabetes gestacional sobre los indicadores de adiposidad en los primeros 18 años; revisión sistemática. *Nutrición Hospitalaria*, 29(2), 397-401.
- Jingi, A. M., Noubiap, J. J., Essouma, M., Bigna, J. J., Nansseu, J. R., Ellong, A., & Mvogo, C. E. (2016). Association of insulin treatment versus oral hypoglycaemic agents with diabetic retinopathy and its severity in type 2 diabetes patients in Cameroon, sub-Saharan Africa. *Annals of Translational Medicine*, 4(20), 395.
- Lamelas, P. M. (2015). Consumo de sodio, presión arterial y eventos clínicos. *Revista de*

- la Federación Argentina de Cardiología, 44, 4-7.
- Márquez Guillén, A., Lang Prieto, J., Valdés Amador, L., Cruz Hernández, J., & Guerrero Rodríguez, E. (2011). Prediabetes y diabetes gestacional. *Revista Cubana de Endocrinología*, 22(1), 58-60.
- McGovern, A., Hinton, W., Correa, A., Munro, N., Whyte, M., & de Lusignan, S. (2016). Real-world evidence studies into treatment adherence, thresholds for intervention and disparities in treatment in people with type 2 diabetes in the UK. *BMJ Open*, 6(11), e012801.
- O'Neill, D., Britton, A., Brunner, E. J., & Bell, S. (2017). Twenty-Five-Year Alcohol Consumption Trajectories and Their Association With Arterial Aging: A Prospective Cohort Study. *Journal of the American Heart Association*, 6(2), e005288.
- Papier, K., Jordan, S., D'Este, C., Bain, C., Peungson, J., Banwell, C., ... Sleight, S. (2016). Real-world evidence studies into treatment adherence, thresholds for intervention and disparities in treatment in people with type 2 diabetes in the UK. *BMJ Open*, 6(11), e012801.
- Secretaría, S. (2016). Ley General de Salud DOF 01-06-2016.
- Tran, B. T., Jeong, B. Y., & Jin, K. O. (2017). The prevalence trend of metabolic syndrome and its components and risk factors in Korean adults: results from the Korean National Health and Nutrition Examination Survey 2008-2013. *BMC Public Health*, 17(1), 71-79.
- Tsenkova, V. K. (2017). Leisure-time, occupational, household physical activity and insulin resistance (HOMAIR) in the Midlife in the United States (MIDUS) national study of adults. *Preventive Medicine Reports*, 5(1), 224-227.
- Yepez, I., Garcia, R., & Toledo, T. (2012). Complicaciones agudas. Crisis hiperglucémicas. *Revista Venezolana de Endocrinología y Metabolismo*, 10(Supl. 1), 75-83.
- Zhu, W., Meng, Y. F., Wu, Y., Xu, M., & Lu, J. (2017). Association of alcohol intake with risk of diabetic retinopathy: a meta-analysis of observational studies. *Scientific Reports*, 7(1), 1-9.