Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Editorial

Higher values of fasting blood glucose and glycated hemoglobin are not associated with mortality in Covid-19 Mexican patients

To the editor:

The SARS-CoV-2 has left a huge impact on death balance associated with Covid-19 around the world. There is a high proportion of these patients with diabetes, who have been documented to have more significant mortality and serious complications [1]. Type 2 diabetes mellitus (T2DM) is the most frequent among this disease spectrum. T2DM is characterized by β-cell dysfunction, insulin resistance, and a chronic pro-inflammatory process that culminates in micro and macrovascular complications. Diabetes is a capital health problem in México, where approximately one out of ten adults older than 20 years has this disease [2].

Recently, abnormal fasting blood glucose (FBG) levels have been associated with increased death risk in Covid-19 patients [3]. Besides, high HbA1c levels in those patients during admission, with diabetes or without as well. These results are associated with pro-inflammatory activity, prothrombotic states, and low levels of oxygen saturation (SaO_2) [4]. Additionally, it has been observed a relationship between increased risk of mortality and higher levels of HbA1c. Thus, HbA1c has been proposed as a risk stratification marker [5]. Nonetheless, the mechanism and clinical meaning of accelerated hemoglobin glycation in this phenomenon are uncertain yet. This work objective was to evaluate HbA1c as a complication and risk predictive mortality marker in patients with or without diabetes with Covid-19 at admission.

A retrospective analysis of clinical and laboratory data obtained from Covid-19 patients at admission to intensive care services in the IMSS Hospital in Celaya, from August 13 to September 02, 2020. Real-Time PCR confirmed the diagnosis for SARS-CoV-2 in nasopharyngeal specimen, performed at the Mexican Diagnostic and Epidemiological Reference Institute. Patients with history of hemolytic anemia, recent hemorrhage or hemoglobinopathy were excluded. Statistical analysis was done in NCSS 2007 by using two-samples Student *t*-test for continuous data and Aspin-Welch test when unequal variances. Tukey's rule was applied for normalization when needed. The χ^2 test for trend analysis resolved qualitative categorical data. Results are shown in Table 1.

In conclusion, there are indeed higher values of FBG and HbA1c in Mexican Covid-19 patients, independently if they had been diagnosed with diabetes. However, this finding is not associated with higher mortality, and it is not necessarily dependent on respiratory complications but with prothrombotic activity. Possibly, the survival outcomes might depend on internal care protocol differences among hospitals. Thus, we suggest that the relationship between HbA1c and D-Dimers in patients with Covid-19 must be further analyzed.

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Table 1
Comparison among clinical and laboratory outcomes of hospitalized Covid-19 patients at admission.

	Diabetes (n = 26)	SEM	Non-diabetes (n = 56)	SEM	P	NC (n = 21)	SEM	P	Deaths (n = 26)	SEM	Recovered (n = 56)	SEM	P	Covid-19 (n = 82)	SEM	Non-Covid-19 (n = 25)	SEM	P
Age (years)[a]	66 [33–87]		59 [21–87]			59 [40–87]			62 [34–81]		61 [21–87]			61 [21–87]		65 [32–87]		
Sex (M:F)	1.2		2.5			2.0			7.7		1.2			1.9		0.7		
Hb (g/dL)	13.56	0.46	14.14	0.30	0.2839	14.19	0.61	0.4075	14.03	0.56	13.92	0.26	0.8496	13.95	0.25	12.12	0.47	<0.05*
Plt ($\times 10^9$/L)	225.85	24.42	226.45	18.95	0.4926	195.57	27.44	0.7932	170.15	24.36	252.3	17.92	<0.05*	226.26	15.00	269.6	23.43	0.0764
Glu (mg/dL)	243.81	16.03	138.23	4.69	<0.05*	159.19	17.35	<0.05*	167.95	13.39	184.14	11.11	0.8052	179.01	8.69	85.44	2.25	<0.05*
HbA1c (%) (mmol/mol)	10.7	0.42	6.9	0.14	<0.05*	7.1	0.18	<0.05*	8.2	0.41	8.2	0.35	0.4913	8.2	0.27	5.7	0.11	<0.05*
	93		52			54[1–5]			66		66			66		39		
CRP (mg/L)					0.5910			0.5670					0.3808					<0.05*
<50	3		7			3			2		8			10		10		
50–180	7		19			7			8		18			26		13		
>180	16		30			11			16		30			46		2		
DD (ng/mL)	1549.17	205.42	1037.63	94.63	<0.05*	1433.74	298.70	0.3722	2395.81	508.92	1130.5	99.64	<0.05*	1206.47	95.84	251.96	33.86	<0.05*
Iron (mg/dL)	103.77	11.32	89.46	6.17	0.2309	80.81	10.30	0.1489	94.96	11.19	93.62	6.31	0.9109					
TS (%)	34.55	3.44	34.65	2.52	0.4908	33.69	3.49	0.5685	30.9	3.42	36.38	2.49	0.1038					
IBC (mg/dL)	222.15	6.17	221.41	5.00	0.9302	229.33	7.93	0.4716	220.5	7.18	222.18	4.71	0.8432					
SaO_2 (%)	89	1.58	90.5	0.80	0.1746	89.86	1.43	0.3478	87.62	1.55	91.58	0.65	<0.05*					
Complications																		
ARDS	6		8			3			6		8			14				
BP	1		3			1			4		0			4				
MI	0		1			1			1		0			1				
Sepsis	0		3			1			2		1			3				
HbA1c (%) (mmol/mol)																		
≤5.7 (39)	0		4			0			0		4							
5.7–6.4 (39–47)	0		14			3			7		7							
≥6.5 (≥48)	26		38			18			19		45							
<7 (<53)	0		34			11			9		25							
≥7 (≥53)	26		22			10			17		31							
Mortality (%)	26.9		33.9		0.7044	23.8		0.9259										
Deaths	7		19			5												
Recovered	19		37			16												

NC = no comorbidities; Hb = hemoglobin; Plt = platelets; Glu = glucose; CRP = C reactive protein; DD = D-dimers; TS = transferrin saturation; IBC = iron binding capacity; SaO_2 = oxygen saturation; ARDS = acute respiratory distress syndrome; BP = bacterial pneumonia; MI = myocardial infarction. SEM = standard error of mean.

[a] Median (lower limit–upper limit).

* Statistical difference with significance level of 0.05 according to t-test or chi-square.

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Declaration of interests

None.

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