GLYCEMIC CHARACTERISTICS AND CLINICAL OUTCOME IN A SAMPLE OF EGYPTIAN COVID-19 PATIENTS WITH OR WITHOUT DIABETES

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ABSTRACT:

Background: *The high prevalence of diabetes globally makes it a frequent comorbidity in patients with coronavirus-associated disease 2019 (COVID-19. As is often identified as an independent risk factor for developing lower respiratory tract infections*

Aim of work: *This study aims to describe the glycemic characteristics and clinical outcomes in a sample of Egyptian COVID-19 patients with or without diabetes.*

Patients and Methods: *A cross-sectional study on 160 patients in chest out-patient clinic of Kafr el sheikh chest hospital divided to 2 groups: 80 diabetic covid-19 patients and 80 non-diabetic covid-19patients. All candidates were subjects to history, laboratory investigations (FPG, 2hrsPP, HbA1c, RT-PCR, CRP, D-dimer, Serum ferritin, Serum cholesterol, Serum Urea, Serum creatinine, SGOT, SGPT and Oxygen saturation. Evaluation of the clinical outcome whether recovery after home isolation and treatment, hospitalization in isolation hospitals, or ICU admission.*

Results*: Statistically significant higher in Diabetic than non-Diabetic covid -19 patients regarding Age, BMI, Chest CT and Prognosis, D-dimer(mg/l), S. Ferritin, CRP, O2 saturation, SGOT, SGPT, S. cholesterol, S. urea, S. creatinine and DKA/HHS. Age, BMI, D-dimer, S. Ferritin, CRP, SGOT, SGPT, S. cholesterol, S.urea and S. creatinine are positively correlated with FBG while O2 saturation is negatively correlated with FBG. A highly statistically significant difference found between home treated, hospital admitted and ICU admitted groups regarding Age, BMI, Chest CT, PCR, FBG, 2HPP, D-dimer, S. Ferritin, CRP, O2 saturation, SGOT, SGPT, S. cholesterol, S.urea, S. creatinine and DKA/HHS being higher I ICU admitted followed by hospital admitted then home treated patients. Serum ferritin was the most predictive factor for ICU admission.*

Conclussions: *Diabetic patients are more susceptible to severe COVID-19 infection, and show higher levels of inflammatory markers. Serum ferritin is highly sensitive predictors of need for ICU admission..*

Keywords: *DM, COVID-19, clinical outcome.*

INTRODUCTION

Since December 2019, novel coronavirus- (SARS-CoV-2-) infection (COVID-19) has rapidly spread throughout China and around the world. The International Committee on Taxonomy of Viruses (ICTV) has named this virus SARS-

CoV-2, with the disease termed COVID-19. The high infectivity of COVID-19 resulted in a rapid increase of new cases**.** [(1)]

The burden of the Severe Acute Respiratory Syndrome-Coronavirus-2 (SARS-CoV-2), which is known as COVID-19 has being increasing worldwide. Since December 2019, more than 21 million people have been infected including over 3 million deaths.[(2)]

Confirmed covid-19 Patients had clinical manifestations of fever, cough, shortness of breath, muscle ache and to a less extent confusion, sore throat, rhinorrhea, chest pain, diarrhea, and nausea and vomiting. [(3)]

Chest CT offers the great sensitivity for detecting COVID-19, especially in a region with severe epidemic situation. The specificity is low. In the context of emergency disease control, chest CT provides a fast, convenient, and effective method to early recognize suspicious cases[(4)].

According to imaging examination, 74 patients (75%) showed bilateral pneumonia, 14 patients (14%) showed multiple mottling and ground-glass opacity, and one patient (1%) had pneumothorax.[(3)]

The high prevalence of diabetes globally makes it a frequent comorbidity in patients with coronavirus-associated disease 2019 (COVID-19. As diabetes increases the susceptibility to different kinds of respiratory infections, is often identified as an independent risk factor for developing lower respiratory tract infections, genitourinary tract infection, skin and soft tissue infection and GIT infection. *(5)*

The link between Covid-19 and diabetes is reciprocal. One the one hand, hyperglycemia raises the possibility of developing severe COVID-19. On the other hand, individuals with Covid-19 have shown signs of both newly developed diabetes and severe metabolic consequences of pre-existing diabetes, such as diabetic ketoacidosis and hyperosmolarity for which extraordinarily high doses of insulin are necessary. 1-3 These diabetic symptoms are difficult to treat clinically and point to a complicated aetiology for diabetes caused by Covid-19[(6)],

AIM OF STUDY

This study aims to describe the glycemic characteristics and clinical outcomes in a sample of Egyptian COVID-19 patients with or without diabetes

PATIENTS AND METHODS:

This cross sectional study included 160 patients in chest out-patient clinic of Kafr El Sheikh Chest Hospital and will be divided to 2 groups

Group 1: 80 diabetic patients with covid-19.

Group 2: 80 non diabetic patients with covid-19.

Ethical Consideration: An approval of the study was obtained from Ain shams University Academic and Ethical Committee. Written informed consent of all the participants' parents was obtained.

Inclusion criteria:

COVID-19 Patients of both sexes aged 40-60 years old, 80 patients were diabetic, and 80 patients were non-diabetic

Exclusion criteria:

Patients with co-morbidities conditions like immune disorders, malignancy, and patients with immunosuppressive drugs will be excluded.

Methodology:

All cases were subjected to full history taking, general examination, laboratory investigation (Fasting blood glucose, 2hrs post prandial, HbA1c, RT-PCR, CRP, D-

dimer, Serum ferritin, Serum cholesterol, Serum Urea, Serum creatinine, SGOT, SGPT, Oxygen saturation by pulse oximetry & acetone in urine**)** and Evaluation of the clinical outcome of the patient after COVID-19 infection whether recovery after home isolation and treatment, hospitalization in isolation hospitals, or ICU admission.

Statistical analysis:

All data were collected and analyzed using SPSS software package (Version 20.0. Armonk, NY: IBM Corp). The qualitative data were presented as number and percentages while quantitative data were presented as mean, standard deviations and ranges The comparison between two groups with qualitative data were done by using ***Chi-square test***, The comparison between two independent groups with quantitative data and parametric distribution was done by using ***Independent t-test.*** The critical P-value was considered statistically significant at P <0.05 and P <0.01 was considered highly significant.

RESULTS

There was no statistically significant difference found between two groups regarding Sex, and there was highly statistically significant difference found between two groups regarding Age, BMI, *Chest CT and Prognosis* being higher in diabetic group as presented in table 1.

Table (1): comparison if basic characteristics and outcome of both groups.

Variable		Diabetic No.= 80	Non diabetic No.= 80	P-value
Age	Mean ± SD	52.76 ± 4.99	48.03 ± 4.71	<0.001
Sex (M/F)	Female	52/28	45/35	0.257
BMI(kg/m_2)	Mean ± SD	29.37 ± 2.53	26.90 ± 3.15	<0.001
Chest CT	Free	19 (23.8%)	41 (51.2%)	<0.01
	Mild to moderate pneumonia	46 (57.5%)	36 (45.0%)	
	Severe pneumonia	15 (18.8%)	3 (3.8%)	
Prognosis	Home treatment	39 (48.8%)	64 (80.0%)	<0.01
	Hospital admission	29 (36.2%)	13 (16.2%)	
	ICU admission	12 (15.0%)	3 (3.8%)	

There was highly statistically significant difference found between two groups regarding HbA1C, FBG, 2HPP, D-dimer(mg/l), S. Ferritin(0-300ng/ml), CRP, O2 saturation, SGOT, SGPT, S. cholesterol, S. urea, S. creatinine and DKA/HHS being higher in diabetic group as presented in table 2.

Table (2): Comparisson between two groups regarding HbA1C, FBG, 2HPP, D-dimer(mg/l), S. Ferritin(0-300ng/ml), CRP, O2 saturation, SGOT, SGPT, S. cholesterol, S. urea, S. creatinine and DKA/HHS

Variable	**Diabetic No.= 80**	**Non diabetic No.= 80**	**P-value**
HbA1C (%)	7.67 ± 1.27	5.39 ± 0.18	<0.01
FBG(mg/dl)	230.58 ± 75.19	85.68 ± 7.44	<0.01
2hrPP(mg/dl)	300.43 ± 95.71	109.16 ± 13.35	<0.01
D-dimer(mg/l)#	0.91 (0.58 – 1.3)	0.65 (0.41 – 0.87)	<0.01
S. Ferritin(0-300ng/ml)	469.78 ± 161.02	351.76 ± 131.22	<0.01
CRP(mg/l)#	18 (10.15 – 54.5)	12 (6 – 18.5)	<0.01
O2 saturation (%)	89.30 ± 8.14	94.76 ± 4.97	<0.01
SGOT (u/l)	42.43 ± 15.32	32.80 ± 11.78	<0.01
SGPT (u/l)	43.61 ± 14.85	33.01 ± 8.80	<0.01
S. cholesterol (mg/dl)	253.19 ± 52.17	214.61 ± 41.33	<0.01
S. urea (mg/dl)#	39 (32 – 57)	34 (28 – 41.5)	<0.01
S. creatinine (mg/dl)#	1.1 (0.92 – 1.33)	0.91 (0.8 – 1.13)	<0.01
DKA/HHS(yes/no)	11/69	0/80	0.001

Median (IQR). Other quantitative data were expressed as mean ± SD.

There was a significant positive Correlation between FBG with Age, BMI, HbA1C, D-dimer (mg/l), S. Ferritin (0-300 ng/ml), CRP, O2 saturation, SGOT, SGPT, S. cholesterol, S. urea and S. creatinine as presents in table 3.

Table (3): Correlation between FBG with Age, BMI, HbA1C, D-dimer (mg/l), S. Ferritin (0-300 ng/ml), CRP, O2 saturation, SGOT, SGPT, S. cholesterol, S. urea and S. creatinine

Variable	FBG	
	R	P-value
Age	0.348**	<0.01
BMI(kg/m_2)	0.295**	<0.01
D-dimer(mg/l)	0.334**	<0.01
S. Ferritin(0-300ng/ml)	0.321**	<0.01
CRP(mg/l)	0.342**	<0.01
O2 saturation (%)	-0.381**	<0.01
SGOT(u/l)	0.307**	<0.01
SGPT(u/l)	0.353**	<0.01
S. cholesterol(mg/dl)	0.231**	0.003
S.urea(mg/dl)	0.228**	0.004
S. creatinine(mg/dl)	0.396**	<0.01

Univariate logistic regression analysis shows that age >53 years, BMI >29.8 kg/m^2, S.Ferritin >563ng/ml, SGOT >42u/l, SGPT >49u/l, hepatitis, S.Cholesterol >219mg/dl, S.Urea >59mg/dl, S. Creatinine >1.31mg/dl, presence of renal complications and presence of DKA/HHS were associated with ICU admission while FPG and 2hrPP were not associated with ICU admission. The multivariate logistic regression analysis shows that S.Ferritin >563ng/ml and SGOT >42u/l were the most factors associated with ICU admission.

CRP >35mg/l and D-dimer > 1.18mg/l and O2 ≤81% were excluded from the regression model due to sensitivity of 100.0%

100.0% of cases admitted to ICU had severe CT chest

Table (4): Univariate and Multivariate logistic regression analysis for factors associated with ICU admission

	Univariate				Multivariate			
	P-value	Odds ratio (OR)	95% C.I. for OR		P-value	Odds ratio (OR)	95% C.I. for OR	
			Lower	Upper			Lower	Upper
Age >53	<0.001	11.676	3.122	43.667	–	–	–	–
BMI >29.8	<0.001	24.917	5.331	116.456	–	–	–	–
FBG (after) >170	0.811	1.148	0.371	3.554	–	–	–	–
2hrPP (after) >251	0.315	2.016	0.513	7.914	–	–	–	–
S. Ferritin (ng/ml) >563	<0.001	170.545	20.474	1420.616	<0.001	295.544	19.701	4433.697
SGOT >42	<0.001	22.364	5.832	85.754	0.002	43.614	4.191	453.874
SGPT >49	<0.001	22.167	6.509	75.484	–	–	–	–
Hepatitis	<0.001	27.000	7.728	94.335	–	–	–	–
S. cholesterol >219	0.027	5.583	1.216	25.633	–	–	–	–
S.urea >59	<0.001	15.059	4.596	49.340	–	–	–	–
S. creatinine >1.31	<0.001	20.308	6.023	68.466	–	–	–	–
Renal complications	<0.001	22.167	6.509	75.484	–	–	–	–
DKA/HHS	<0.001	7.169	1.815	28.308	–	–	–	–

DISCUSSION:

Corona viral disease-2019 (COVID-19) is now a global pandemic and a public health emergency on a global scale. The pandemic has put the world's healthcare system under strain. From a minor acute respiratory illness to more serious pneumonia with related respiratory failure, acute respiratory distress syndrome, and septic shock, the illness can vary in severity ***(Caron et al., 2021)***[7]

Diabetes has a huge impact on health and finances globally and is a leading cause of morbidity and mortality. By 2045, there will be 700 million people with diabetes worldwide, up from the 463 million who had it in 2019. On the other hand, as of 20 February 2021, the COVID-19 pandemic had caused more than 100 million infections and more than two million fatalities worldwide ***(Li et al., 2021)***[8]

This was a cross-sectional study aiming to evaluate the glycemic status and clinical outcomes of covid-19 adult patients. The study was conducted on 160 COVID-19 cases divided to 80 patients with type 2 diabetes and 80 age and sex matched non-diabetic subjects as control in chest out-patient clinic of Kafr-elsheikh Chest hospital.

The mean age was 50.39 ± 5.39 years included 97 men and 63 women then the patients were divided into two groups:

Group I (**80**) included diabetic patients with covid-19 confirmed by RT-PCR positive.

Group II (**80**) included non-diabetic patients with covid-19 confirmed by RT-PCR positive.

Our current study showed a highly significant difference between Diabetic and Non diabetic COVID-19 patients regarding age *(p-value <0.01)* being older in diabetic patients than group non-diabetic patients and it was positively correlated with FBG *(p-value <0.01*).

This conclusion was consistent with earlier research by ***Moftakhar et al. (2021*** [9] who discovered that COVID-19 patients with diabetes had a greater median age than COVID-19 patients without diabetes (59 vs. 37). The greater average age of COVID-19 patients with diabetes can be attributed to the fact that diabetes is a chronic disease, and chronic diseases are more prevalent as people age.

Our study found also a high statistically significant difference between Diabetic and Non diabetic COVID-19 patients regarding CRP *(p-value <0.01)* being higher in diabetic group than non-diabetic group and it was positively correlated with FBG *(p-value <0.01*).

Similarly ***(Hoimonti et al., 2021)***[10] reported that the serum CRP concentration in COVID-19 diabetic patients was significantly higher than non-diabetic patients indicating severe illness, as diabetic patients generally have an impaired innate and adaptive immune response, characterized by a state of chronic low-grade inflammation ***(Abu Farha et al., 2020)***[11].

While regarding serum ferritin our current study found a high statistically significant difference between Diabetic and Non diabetic COVID-19 patients *(p-value <0.01)* being higher in diabetic patients than group non-diabetic patients and in the same time it was positively correlated with FBG *(p-value <0.01*).

And this finding is Similar to the study by ***(Yan et al., 2020)***[12] that revealed relatively higher ferritin levels in covid-19 patients with diabetes than that found in covid-19 patients without diabetes. In addition ***(Ashoorapour et al., 2020)***[13] study reported that there was a positive correlation between serum ferritin and FBS, HbA1C, serum insulin.

Various reports suggest that diabetes activate several pathways leading to T-cell differentiation, immune system imbalance, pro- and anti-inflammation imbalance. Diabetes has been reported to be associated with infection and disease progression ***(Yan et al., 2020)***[12]

While regarding D. dimer there was highly statistically significant difference found between Diabetic and Non diabetic COVID-19 patients *(p-value <0.01*) being higher in diabetic patients than non-diabetic patients and it was positively correlated with FBG *(p-value <0.01*).

This goes with the results of ***(Miri et al., 2021)***[14] who found that D-dimer levels were statistically higher in COVID-19 diabetic patients compared to non-diabetic patients.

Interestingly, it is widely known that diabetes causes an increase in coagulability, and that people with diabetes consistently have higher levels of plasminogen activator inhibitor-1. Thus, greater coagulability in diabetes may be a possible mechanism that relates diabetes to severity of COVID-19 ***(Abu Farha et al., 2020)***[11]**.**

Our study showed a high statistically significant difference found between Diabetic and Non diabetic COVID-19 patients regarding chest CT findings *(p-value <0.01)* being more severe in diabetic group in which (18.8%) of patients had Severe pneumonia, (57.5%) had mild to moderate pneumonia and (23.8%) of patients had free CT than non-diabetic group in which (3.8%) of patients had severe pneumonia, (45.0%) of patients had mild to moderate pneumonia and (51.2%) of patients had free CT. In addition we found that CT finding severity was positively related to FBG.

This goes with ***(Lacobellis et al., 2020*** [15] who suggested that admission hyperglycemia predicted severity of radiological findings in patients with COVID-19. In addition to ***(Guo et al., 2020)*** [16] reported that the CT severity score was higher in diabetic patients than in non-diabetic patients with COVID-19.

We found also a high statistically significant difference between Diabetic and Non diabetic COVID-19 patients regarding serum urea and creatinine *(p-value <0.01)* being higher in diabetic group than non-diabetic group and it was positively correlated with FBG *(p-value <0.01*).

These results were also in parallel to a study by ***(Zhang et al., 2020)***[17] who stated that of the 258 hospitalized patients (63 with diabetes) with COVID-19. Patients with diabetes had significantly higher levels of serum creatinine and urea nitrogen at admission compared with those without diabetes.

In addition we detected a high statistically significant difference between Diabetic and Non diabetic COVID-19 patients regarding prognosis *(p-value <0.01)* being worse in diabetic group in which 15.0% needed ICU admission, 36.2% needed Hospital admission and 48.8% needed Home treatment, than non-diabetic group in which 3.8% needed ICU admission, 16.2% needed Hospital admission and 80.0% needed Home treatment.

These observations were in line with previous findings of a retrospective study conducted on 417 consecutive COVID-19 patients in Kuwait by ***(Alshukry et al., 2021)***[18] which stated that the diabetic group included a significantly higher proportion of patients requiring admission to the ICU.

The association of diabetes and hyperglycemia with disease progression has been linked to increased inflammation, hypercoagulability and lung dysfunction in COVID-19 ***(Guo et al., 2020)***[16]

Moreover we found a high statistically significant difference between Home treated, Hospital admitted and ICU admitted groups regarding FBG and 2HPP *(p-value <0.01),*

being the highest in ICU admission group, followed by hospital admission group, then home treatment group, which is in agreement with ***(Barrak et al., 2020)*** [19] who stated that even a small incremental increase within the normal range of FBG was associated with a substantial increase in risk of ICU admission for COVID-19 patients.

Elevated glucose levels directly increase SARS-CoV-2 replication, and glycolysis sustains SARS-CoV-2 replication via the production of mitochondrial reactive oxygen species and activation of hypoxia-inducible factor. Therefore, hyperglycaemia might support viral proliferation ***(Lim et al., 2021)*** [20]

Surprisingly our study found that there was no statistical significant difference between the three groups *(p-value >0.05)* regarding HbA1c.

This goes with ***(Cariou et al., 2020)*** [21] who indicated that HbA1c was not associated with a worse outcome. In contrast to ***(Schnell et al., 2019)*** [22]study which stated that DM patients admitted to the ICU had higher levels of HbA1c than non-ICU patients while the average DM duration was similar in two groups.

In our study we found a high statistically significant difference between ICU admitted, Hospital admitted and Home treated patients regarding CT chest findings being more severe in ICU admitted then hospital admitted then home treated group.

We found that all ICU admitted patients had severe pneumonia on chest CT by CT-SS.

This result is similar to ***(Ghufran et al., 2021)*** [23] who found that oxygen requirements and the need for ICU admission increase with the increasing CT severity Acute respiratory distress, pulmonary fibrosis, and eventually mortality can result from the virus directly damaging the lung, creating inflammatory changes in the alveolar membrane that limit oxygen exchange. This causes a progressive rise in oxygen consumption.

We found a high statistically significant difference between ICU admitted, Hospital admitted and Home treated, patients regarding age being the oldest in ICU admitted group followed by hospital admitted group then home treated group with *p-value <0.01.*

Supported by ***(Santesmasses et al., 2020)*** [24] elderly individuals have been most severely affected as evidenced by the significantly high morbidity and mortality in this group.

Our study found a high statistically significant difference between ICU admitted, Hospital admitted and Home treated, patients regarding BMI being the highest in ICU admitted group followed by hospital admitted group then home treated group with *p-value <0.01.*

This is in agreement with ***(Simonnet et al., 2020)*** [25] study that showed a high frequency of obesity among patients admitted in intensive care for SARS-CoV-2.

There was a high statistically significant difference found between ICU admitted, Hospital admitted and Home treated, patients regarding CRP and D.dimer being the highest in ICU admitted group followed by hospital admitted group then home treated group with *p-value <0.01.*

CRP >35 and D-dimer > 1.18 and O2 ≤81 had sensitivity of 100.0% ICU admission.

These results were consistent with a retrospective study held by ***(Ullah et al., 2020)*** [26] which believed that CRP and elevated D-Dimer at presentation could serve as a reliable early predictor for need for IMV and upgrade to ICU.

Nonetheless, both high CRP and raised D-Dimer are useful prognostic markers for need for IMV and upgrade to ICU.

Findings about D.dimer support the hypothesis that severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections could induce the dysfunction of the hemostatic system, leading to a hypercoagulable state, a condition which we commonly encounter in sepsis ***(Lue et al.,2020)*** [27]

While results about CRP may be explained by that the synthesis of CRP by hepatic cells is linked to IL-6, the levels of CRP might reflect the IL-6 secretion due to the activation by SARS-CoV-2of monocytes, macrophages, and dendritic cells. The clinical importance is linked to the fact that IL-6 is involved in the cytokine storm ***(Villoteau et al., 2021)***[28]

There was a high statistically significant difference found between ICU admitted, Hospital admitted and Home treated, patients regarding serum Ferritin being the highest in ICU admitted group followed by hospital admitted group then home treated group with *p-value <0.01*.

The multivariate logistic regression analysis we done showed that S.Ferritin >563 was the most predictor factors associated with ICU admission.

This was consistent with a meta-analysis by ***(Kaushal et al., 2022)***[29] which found that patients requiring ICU had a higher serum ferritin level than patients who did not require the same. The same study concluded that Serum ferritin was a strong predictor of ICU admission among COVID-19 patients.

This may lead to the notion of the presence of secondary hemophagocytic lymphohistiocytosis (sHLH) in COVID-19.

In our study 16 COVID-19 cases developed hyperglycemia with FBG > 140 mg/dl (new onset diabetes).

This event can be explained by. An immunostaining study by ***(Liu et al., 2020)*** [30] found that Structural analysis suggests that SARS-CoV-2 can bind to human angiotensin-converting enzyme 2 (ACE2) receptors, as occurs with SARS-CoV. ACE2 was highly expressed in lung, kidney, heart, and endocrine pancreatic islets and poorly expressed in exocrine pancreatic tissues. These results suggest that SARS-CoV-2 invades pancreatic islets through ACE2 receptors and causes disease by triggering acute hyperglycemia. Nonetheless, more studies are required to confirm this hypothesis.

On comparing these cases with known diabetic group, there was a high statistical significant difference between two groups *(p-value<0.01)*, being higher in new onset diabetes than known diabetic group regarding, D.dimer, CRP, serum ferritin, CT chest and prognosis.

This strongly agrees with the results of a study held in Wuhan in December 2021 on 2366 COVID-19 patients which stated that new onset diabetes patients had higher levels of key inflammatory parameters than known diabetic group (p<0.001), such as C-reactive protein, Serum Ferritin and D-dimer. They also had higher incidence of clinical complications, such as acute respiratory distress syndrome, the highest rate of ICU admission and death ***(Wenjun et al., 2021)***[31]

Conclusion

Diabetic patients are more susceptible to severe COVID-19 infection and show higher levels of inflammatory markers and systemic affection as liver functions, kidney functions and serum cholesterol.

Some cases experience hyperglycemia for first time in concordance with COVID-19 infection, and those patients show higher levels of inflammatory markers than know diabetic and non-diabetic individuals

COVID-19 infection severity and need for hospital and ICU admission is higher in patients with higher inflammatory markers, higher blood glucose and is associated with

higher liver functions, kidney functions and serum cholesterol.

Poorly controlled diabetes was associated with severe lung lesions as evidenced by certain CT parameters and bad clinical prognosis, and there was a positive correlation between blood glucose level (FBG) on admission and lung involvement in COVID-19 patients.

Recommendations

To prevent fatality in COVID-19 patients, we suggested: Tight control of blood glucose in diabetic covid-19 patients, Strict follow up of Oxygen saturation, D-dimer, CRP, S. ferritin, kidney functions, liver function and acute diabetic complications in Diabetic COVID-19 patients, Further studies are needed to elucidate the potential biological mechanisms by which Covid-19 affecting diabetic patients, Further studies that include larger number for Follow up of diabetic patients with Covid-19 are needed, to evaluate potential complications.

Conflict of interest:

The authors declare that they have no conflict of interest.

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خصائص نسبة السكر في الدم والنتائج السريرية في عينة من مرضى كوفيد -19 المصريين المصابين بالسكري أو غير المصابين به

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الخلفية: الانتشار المرتفع لمرض السكري على مستوى العالم يجعله مراضة مشتركة متكررة في المرضى الذين يعانون من مرض مرتبط بفيروس كورونا 2019 (COVID-19). نظرًا لأن مرض السكري يزيد من التعرض لأنواع مختلفة من التهابات الجهاز التنفسي ، غالبًا ما يتم تحديده كعامل خطر مستقل لتطوير الجهاز التنفسي السفلي التهابات المسالك

هدف العمل: تهدف هذه الدراسة إلى وصف خصائص نسبة السكر في الدم والنتائج السريرية في عينة من مرضى COVID-19 المصريين المصابين بالسكري أو غير المصابين به.

المرضى والطرق: دراسة مقطعية أجريت على 160 مريضاً في عيادة الصدر الخارجية بمستشفى الصدر كفر الشيخ وسيتم تقسيمها إلى مجموعتين: 80 مريضاً بالسكري مصابين بفيروس كوفيد -19 ومرضى غير مصابين بمرض كوفيد - 19. كان جميع المرشحين خاضعين للتاريخ الكامل ، والتحقيقات المعملية (جلوكوز الدم الصائم ، ساعتين بعد الأكل ، HbA1c، RT-PCR، CRP، D-dimer ، مصل الفيريتين ، كوليسترول المصل ، مصل اليوريا ، مصل الكرياتينين ، SGOT، SGPT ، تشبع الأكسجين عن طريق قياس التأكسج النبضي والأسيتون في البول وتقييم النتيجة السريرية للمريض بعد الإصابة بـ COVID-19 سواء التعافي بعد العزل المنزلي والعلاج أو الاستشفاء في مستشفيات العزل أو دخول وحدة العناية المركزة.

النتائج: ذات دلالة إحصائية أعلى في مرضى السكري مقارنة بغير مرضى السكري - 19 فيما يتعلق بالعمر ، مؤشر كتلة الجسم ، التصوير المقطعي المحوسب للصدر والتشخيص ، D-dimer (mg / l)، S. Ferritin، CRP، O2 التشبع ، SGOT، SGPT، .S، S. اليوريا ، S. الكرياتينين و DKA / HHS. يرتبط العمر ، مؤشر كتلة الجسم ، D-dimer، S. Ferritin، CRP، SGOT، SGPT، S. كوليسترول ، S.urea و S. الكرياتينين ارتباطًا إيجابيًا مع FBG بينما يرتبط التشبع بالأكسجين سلبًا مع FBG. تم العثور على فروق ذات دلالة إحصائية عالية بين المجموعات المعالجة في المنزل ، والمستشفى والمقبل في وحدة العناية المركزة فيما يتعلق بالعمر ، مؤشر كتلة الجسم ، تصوير الصدر ، PCR، FBG، 2HPP، D-dimer (mg / l)، S. Ferritin (0-300ng / ml)، CRP، O2 ، التشبع ، SGOT ، SGPT، S. شدة نتائج التصوير المقطعي المحوسب للصدر ، وتشبع الأكسجين ، وفيريتين المصل ، و CRP و D. كان مصل الفيريتين هو العامل الأكثر تنبؤًا بقبول وحدة العناية المركزة.

الارتجاجات: مرضى السكري أكثر عرضة للإصابة بعدوى COVID-19 الشديدة ، ويظهرون مستويات أعلى من علامات الالتهاب والعاطفة الجهازية مثل وظائف الكبد ووظائف الكلى والكوليسترول في الدم. شدة نتائج التصوير المقطعي المحوسب للصدر ، وتشبع الأكسجين ، ومصل الفيريتين ، و CRP و D.