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OUTCOMES OF COVID-19 IN EGYPTIAN PATIENTS

By

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ABSTRACT

Background: Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome-coronavirus-2 (SARS-CoV2), is an ongoing pandemic that has already affected millions of patients worldwide, and is associated with significant morbidity and mortality burden.

Objective: To characterize the clinical manifestations and outcomes of COVID-19 in Egyptian patients.

Patients and Methods: This was a retrospective cohort study conducted on 333 subjects with COVID-19 who were admitted to Al-Azhar University Specialized Hospital, Quarantine Hospital, and some patients during follow up after discharge from other quarantine hospitals, during the period from 15th of April, 2020 to 31st of August, 2020. Presenting clinical manifestations, laboratory findings, imaging findings and mortality rate were recorded from electronic medical records and sometimes from patients.

Results: The vast majority had cough (82.6%) and fever (51.7%), while 23.4% had dyspnea among COVID-19 patients. There was a significant older age among died cases (66.4 ± 17.4 years old) than recovered cases (40.3 ± 14.9 years old) (p- value <0.001). The overall co-morbiditis 89.5% and 38.5% in died and recovered cases respectively. Significant differences (p-value < 0.001) were found between died and recovered patients regarding, Lymphocytes and neutrophilic/ lymphocytic ratio (NLR). The C-reactive protein (CRP), ferritin and D-Dimer were higher in died cases. Crazy paving appearance was the findings in CT chest in deceased patients. The mortality rate was 5.7%.

Conclusions: Age, obesity, lymphopenia, D. dimer, CT chest findings and other co-morbid disease could be considered as a predictor of outcome among COVID-19 patients.

Keywords: COVID-19, Egypt, clinical characterizations, hematological indices, inflammatory markers, mortality.

INTRODUCTION

In December 2019, a cluster of patients with pneumonia of undetermined etiology was recognized in Wuhan, Hubei, China *(Huang et al., 2020)*. Subsequently, a novel coronavirus (SARS-CoV-2) was identified from lower respiratory tract samples obtained from affected patients *(Zhu et al., 2020)*. Structural analysis suggests that SARS-CoV-2 might be able

to bind to the angiotensin-converting enzyme (ACE) 2 receptor, as SARS-CoV in humans *(Lu et al., 2020)*. Defining the clinical characteristics and associated outcomes of patients diagnosed with coronavirus disease (COVID-19) is integral to improving our understanding and management of this disease. Several articles have recently been published, describing the clinical features and outcomes of retrospective cohorts of patients with COVID-19 *(Guan et al., 2020*, *Richardson et al., 2020* and *Zhou et al., 2020)*. The full clinical presentation of COVID-19 still not understood, but among the most common presentations were dry cough, fever, dyspnea, and pneumonia. To date, no effective vaccines or specific drugs have been reported that specifically act against COVID-19 *(Xu et al., 2020)*. People with co-morbidities are at risk for COVID-19 pneumonia Furthermore, blood biomarkers differ significantly among COVID- 19 patients with different disease severities *(Guan et al., 2020)*. Importantly, significant differences have been noted in the clinical and demographic features of COVID-19 patients in different regions of the world *(Lippi et al., 2020)*. As the novel coronavirus continues to evolve, there are still many limitations to our knowledge of who exactly this virus would impact critically.

The present work aimed to study the clinical features and characteristics of patients hospitalized with SARS- CoV2 infection at our community, specifically to analyses the factors associated with disease severity and mortality.

PATIENTS AND METHODS

This retrospective cohort study has been conducted on 333 COVID-19 patients who were admitted to Al-Azhar University specialized hospital, quarantine hospital and some patients during follow up after discharge from other quarantine hospitals, during the period from 15th of April 2020 to 31 of August 2020. Before starting the study, approval from the Ethics Committee, Faculty of Medicine, Al-Azhar University, Cairo, Egypt, was obtained. Additionally, an informed consent was obtained from all subjects before recruitment for use of their medical reports. Diagnosis of COVID-19 is based on the history of epidemiologic exposure, clinical manifestations; radiological and laboratory findings of COVID-19 infection *(Wang et al., 2020)*. **The inclusion criteria** included, positive result confirmed by standard SARS-CoV-2 RT-PCRTest, age ≥ 18 years with self-care ability and respiratory rate more than 25 per/ minute with blood oxygen saturation less than or equal to 95%, at rest. There were **exclusion criteria** that include respiratory rate less than 25 or blood oxygen saturation more than 95%, at rest, other active infectious disease and mental illness. All patients were subjected to detailed medical history for age, BMI, smoking, co-morbidities and clinical characterizations (cough, dyspnea, fever, sore throat, and diarrhea). Laboratory investigations were done at diagnosis including complete blood count, neutrophilic count, lymphocytic count and neutrophilic/ lymphocytic ratio. Liver function tests (SGPT, SGOT, serum bilirubin and serum albumin), renal function tests (serum creatinine and blood

urea), fasting blood sugar and HbA1c for diabetic patients, CRP, Ferritin, D. Dimer. Radiological investigations in the form of X-ray Chest and CT Chest were reported by radiologist for all patients. On CT chest, each of the Five lung lobes was visually scored from 0 to 5 as follows: 0, no involvement; 1, < 5% involvement; 2, 25% involvement; 3, 26%–49% involvement; 4, 50%–75% involvement; and 5, > 75% involvement *(Pan et al., 2020)*. All patients were received medical treatment according to protocols of ministry of health and population-Egypt. Confirmed COVID-19 cases were categorized into recovered and died cases.

Statistical analysis:

Data were analyzed using Statistical Program for the Social Sciences (SPSS) version 24. Quantitative data were expressed as mean± standard deviation (SD) and median qualitative data were expressed as frequency and percentage.

Mann–Whitney U test was used when comparing between two means (for abnormal distributed data). Chi-square test was used when comparing between non-parametric data. P-value < 0.05 was considered significant.

RESULTS

The mean ±SD age of was 41.8 ± 16.2 years, there were 52.3% males and 47.7% females, BMI ranged from 20-42 kg/m2, there were 28.5% smokers and 71.5% non-smokers. The patients were categorized according to outcome into died cases (19 patients) and recovered cases (314 patients). There was a significant older age among died cases mean ±SD (66.4 ± 17.4 years old) than recovered cases mean ±SD (40.3 ± 14.9 years old) (p-value < 0.001). The BMI was higher in died cases (29.4 ± 5.1 kg/m²) than recovered cases (24.7 ± 3.07 kg/m²). However, there is no significant difference (p-value > 0.05) were found between died and recovered patients as regard sex and smoking **(Table 1)**.

Table (1): Description of demographic data in all studied patients and comparisons between died and recovered cases among COVID-19 patients

Parameters		Studied patients (N = 333)	
Age (years)	**Mean ±SD**	41.8 ± 16.2	
	Min – Max	18 – 96	
Sex	**Male**	174	52.3%
	Female	159	47.7%
BMI (kg/m²)	**Mean ±SD**	24.9 ± 3.4	
	Min – Max	20 – 42	
Smoking	**Non-smoker**	238	71.5%
	Smoker	95	28.5%

Parameters \ Outcomes		Died (n = 19)		Recovered (n = 314)		P-value
Age (years)	**Mean ±SD**	66.4 ± 17.4		40.3 ± 14.9		**< 0.001**
	Median	69		37		
Sex	**Male**	12	63.2%	162	51.6%	0.327
	Female	7	36.8%	152	48.4%	
BMI (kg/m²)	**Mean ±SD**	29.4 ± 5.1		24.7 ± 3.07		**< 0.001**
	Median	29		24		
BMI (kg/m²)	**Normal**	4	21.1%	211	67.2%	**< 0.001**
	Overweight	15	78.9%	103	32.8%	
Smoking	**Non**	11	57.9%	227	72.3%	0.177
	Smoker	8	42.1%	87	27.7%	

The vast majority had cough (82.6%) and fever (51.7%), the sore throat was reported in 42.9% while 23.4% had dyspnea as initial clinical presentation and only 0.9% had diarrhea as initial presentations, but all patients after that had dyspnea **(Figure 1)**.

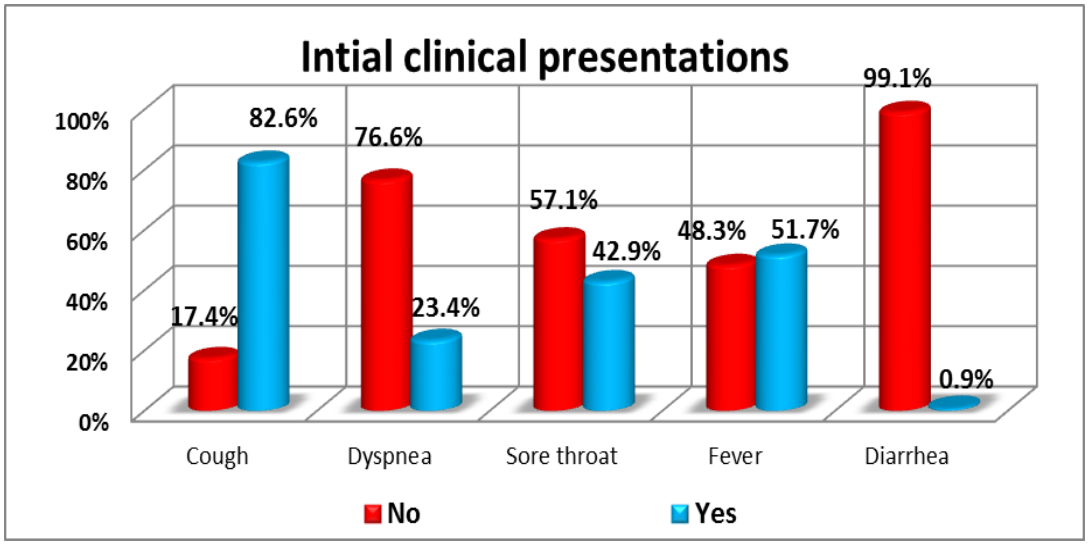

Figure (1): Clinical characteristics on initial hospital presentations

Significant difference (p-value < 0.001) were found between died and recovered patients as regard chronic diseases (DM, HTN, IHD, CKD & co-morbidity) as the percentage of diabetes, hypertension. Ischemic heart disease, chronic kidney disease and COPD were higher in died patients. The overall co-morbidities 89.5% and 38.5% in died and recovered cases respectively **(Table 2)**.

Table (2): Comparisons of chronic diseases between died and recovered cases among COVID-19 patients.

Parameters \ Outcomes		Died (n = 19)		Recovered (n = 314)		p-value
Diabetes Mellitus	**No**	3	15.8%	257	81.8%	**< 0.001**
	Yes	16	84.2%	57	18.2%	
Hypertention	**No**	5	26.3%	239	76.1%	**< 0.001**
	Yes	14	73.7%	75	23.9%	
Ischemic Heart Disease	**No**	14	73.7%	311	99.0%	**< 0.001**
	Yes	5	26.3%	3	1.0%	
Chronic Kidney Disease	**No**	15	78.9%	311	99.0%	**< 0.001**
	Yes	4	21.1%	3	1.0%	
Chronic Obstructive Pulmonary Disease	**No**	12	63.2%	257	81.8%	**0.045 S**
	Yes	7	36.8%	57	18.2%	
Other chronic diseases	**No**	16	84.2%	308	98.1 %	**< 0.001**
	Yes	3	15.8%	6	1.9%	
Co-morbidity	**No**	2	10.5%	193	61.5%	**< 0.001**
	Yes	17	89.5%	121	38.5%	

Regarding the laboratory findings, there were significant difference (p-value < 0.001) were found between died and recovered patients regarding white blood cells, lymphocytes and neutrophilic lymphocytic ratio, as there was significant lower mean ±SD (10.5 ± 7.5 %) of lymphocyte count in died case than recovered cases mean ±SD (25.7 ± 12.2 %). The neutrophilic lymphocytic ratio was significant higher in died cases of COVID-19 (p< 0.001). White blood cells were significantly higher in died cases of COVID-19 mean ±SD (14.8 ± 8.7 x103 mm−3) than recovered cases of COVID-19(7.9 ± 3.6 x103 mm−3) (p<0.001). There is significant difference (p-value < 0.05) were found between died and recovered patients of COVID-19 as regard neutrophil (p 0.004). But there is no significant difference (p-value > 0.05) were found between died and recovered patients of COVID-19 as regard hemoglobulin and platelets. In addition to that, there were significant higher mean ±SD values of CRP (mg/dl), ferritin (ng/ml), D. dimer (ng/ml) among died cases of COVID-19 (66.8 ± 43.5, 892.2 ± 484.2 and 252.2 ± 75.8 respectively) when compared with those recovered cases of COVID-19 (15.6 ± 23.5, 247.2 ± 251.5 and 136.9 ± 109.7 respectively). As regard to mean ±SD values of SGPT (IU/L), SGOT (IU/L), bilirubin (mg/dl), creatinine (mg/dl), blood urea (mg/dl), it is significant higher in died cases of COVID-19 when compared with those recovered cases of COVID-19 (p<0.001). The serum albumin levels (mg/dl) mean ±SD were significant lower in died cases of COVID-19 (3.2 ± 0.4) than recovered

cases of COVID-19 (3.7 ± 0.5) (p<0.001) **(Table 3)**.

Table (3): Comparisons of laboratory tests between died and recovered cases among COVID-19 patients

Parameters \ Outcomes		Died (n = 19)	Recovered (n = 314)	p-value
WBCs ($x10^3$/ul)	Mean ±SD	14.8 ± 8.7	7.9 ± 3.6	< 0.001
	Median	11.1	7.9	
Neutrophil (%)	Mean ±SD	75.7 ± 13.2	66.5 ± 13.5	0.004
	Median	78.4	67.6	
Lymphocyte (%)	Mean ±SD	10.5 ± 7.5	25.7 ± 12.2	< 0.001
	Median	8.7	25	
Neutrophilic/ Lymphocyte ratio	Mean ±SD	14.4 ± 15.6	4.9 ± 8.5	< 0.001
	Median	8.1	2.8	
Hemoglobulin (g/dl)	Mean ±SD	12.4 ± 2.5	12.5 ± 1.5	0.827
	Median	12.7	12.5	
Platelets ($x10^3$/ul)	Mean ±SD	265.5 ± 139.7	244.9 ± 92.9	0.790
	Median	234	238	
CRP (mg/L)	Mean ±SD	66.8 ± 43.5	15.6 ± 23.5	< 0.001
	Median	65	5	
Ferritin (ng/ml)	Mean ±SD	892.2 ± 484.2	247.2 ± 251.5	< 0.001
	Median	760	156	
D-Dimer (ng/ml)	Mean ±SD	252.2 ± 75.8	136.9 ± 109.7	< 0.001
	Median	236	109	
SGOT (U/L)	Mean ±SD	53.1 ± 19.5	33.7 ± 20.3	< 0.001
	Median	46	30	
SGPT (U/L)	Mean ±SD	47.3 ± 21.6	37.7 ± 26.6	0.013
	Median	44	32	
Bilirubin (mg/dl)	Mean ±SD	1.3 ± 0.5	0.96 ± 0.2	< 0.001
	Median	1.2	1	
Serum albumin (g/dl)	Mean ±SD	3.2 ± 0.4	3.7 ± 0.5	< 0.001
	Median	3.1	3.7	
Creatinine (mg/dl)	Mean ±SD	3.04 ± 3.2	0.83 ± 0.3	< 0.001
	Median	1.6	0.8	
Urea (mg/dl)	Mean ±SD	125.7 ± 104.5	41.9 ± 19.5	< 0.001
	Median	90	36.9	

Mean ±SD of HbA1c value was significant higher in died diabetic cases (10.5 ± 0.5 ٪) when compared with those recovered diabetic cases (9.2 ± 1.2٪) (p< 0.001). Normal x-ray was recorded in 4 died cases of COVID-19 (21.1%) and the remaining cases showed bilateral lung opacities in varies degree of mild, moderate and sever (4, 9 and 2 cases respectively). While x-ray in recovered cases of COVID-19, 156 (49.7%) cases were reported normally. There were findings in CT chest of all including cases. Ground glass opacities were recorded in 100 % of recovered COVID-19 patients, however, 94.7% (18 cases) in died cases of COVID-19 patients exhibited crazy paving appearance. Regarding duration of treatment (days), there no significant difference were found between died cases of COVID-19 mean ±SD (10.4 ± 6.2) and recovered patients of COVID-19 mean ±SD (13.6 ± 7.8) (p-value > 0.05) **(Table 4)**.

Table (4): Comparisons between died and recovered cases among COVID-19 patients according to HbA1c in diabetic patients, chest X-ray & CT, chest CT finding and duration of treatment

Parameters	Outcomes	Died (n = 16)		Recovered (n = 57)		p-value
HbA1C (%)	Mean ±SD	10.5 ± 0.5		9.2 ± 1.2		< 0.001
	Median	10.7		9.3		
	Controlled	0	0%	3	5.3%	

Parameters	Outcomes	Died (n = 19)		Recovered (n = 314)		p-value
Chest X-ray	Normal	4	21.1%	156	49.7%	< 0.001
	Bilateral mild lung opacity	4	21.1%	142	45.2%	
	Bilateral moderate lung opacity	9	47.4%	8	2.5%	
	Bilateral severe lung opacity	2	10.5%	8	2.5%	
Chest CT	Score 1	0	0%	131	41.7%	< 0.001
	Score 2	0	0%	84	26.8%	
	Score 3	1	5.3%	55	17.5%	
	Score 4	9	47.4%	21	6.7%	
	Score 5	9	47.4%	23	7.3%	

Parameters	Outcomes	Died (n = 19)		Recovered (n = 314)		p-value
CT	Bilateral GGO	1	5.3%	314	100%	< 0.001
	Crazy paving appearance	18	94.7%	0	0%	

Parameters	Outcomes	Died (n = 19)	Recovered (n = 314)	p-value
Duration (days)	Mean ±SD	10.4 ± 6.2	13.6 ± 7.8	0.147
	Median	10	11	

The overall mortality rate was 5.7 % (19 cases) (Figure 2).

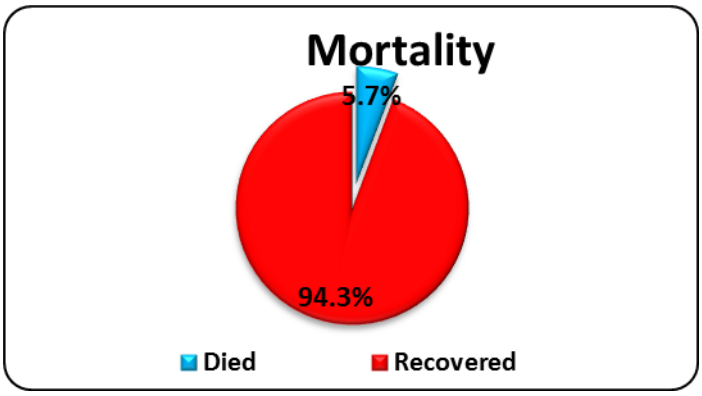

Figure (2): Description of mortality in all studied patients

DISCUSSION

In the current study, we found that cough, fever, dyspnea and sore throat are the main clinical presentations among COVID-19 patients, while diarrhea was the least clinical presentation. In agreement with our findings. *Guan et al. (2020)* reported that the most common COVID-19 presentations were fever and cough. Our findings raised the question of whether fever was an effective screening tool for COVID-19 patients as revealed that, almost half of patients did not have fever as an initial clinical presentation, and this was in agreement with *Almazeedi et al. (2020)*. So, a febrile patient may be missed if the surveillance case definition focuses on fever detection. Our study was in stark contrast to another retrospective cohort study by *Zhou et al. (2020)* who reported about 94% above 37.3 °C. This could be explained by small sample of their study (191 patients).

The diarrhea was a clinical presentation in 0.9 % of our patients, and it was mild which seemed to be inconsistent with the pathogenicity of SARS-CoV-2. *Chan et al. (2020)* and *Wang et al. (2020)* were in agreement with our findings. A possible explanation is that SARS-CoV-2 in the sputum of COVID-19 patients transmitted to the digestive tract through swallowing. The virulence of SARS-CoV-2 in the digestive tract is weakened, and the virus is degraded into fragments that cause only mild digestive symptoms, but not serious gastrointestinal damage *(Zhang et al., 2020)*. Another explanation is patients might be not oriented about diarrhea could be a symptom of COVID-19 infection.

The rapid outbreak of COVID-19 has been a matter of international concern as the disease is spreading rapidly. There is an urgent need to identify the risk populations with poor outcome. Our study identified that older age was one of the risk factors for disease severity and mortality. *Ghweil et al. (2020)* reported that severe COVID-19 was more frequent in older age. This finding reported by multiple studies from different geographic regions *(Knights et al., 2020*; *Liu et al.,*

2020; *Mahase, 2020*; *Wang et al., 2020*; *Yang et al., 2020* and *Zhou et al., 2020)*. This could be explained by age associated with decline cell mediated and humoral mediated immune function *(Zhou et al., 2020)*. Also, ageing is associated with certain changes in pulmonary physiology, pathology and function during the period of lung infection. Therefore, age-related differences in responsiveness and tolerance become obvious, and lead to worse clinical outcomes in elderly individual *(Liu et al., 2020)*.

Concerning tobacco smoking in the outcome of COVID-19 patients, our data showed a pooled prevalence of 28.5 % current smoker, and smoking is not a risk of mortality in COVID-19. This was in agreement with *Ghweil et al. (2020)* who reported lack of significant difference regarding COVID-19 severity in terms of smoking. In contrast to our findings, a systematic review by *Vardavas and Nikitara (2020)* reported that smoking may be associated with a negative outcome. This heterogenicity could be due to difference in the study regions.

Regarding the contribution of increase body weight in the outcome of COVID-19, the obese patients demonstrate insulin resistance and over activity of the renin angiotensin-aldosterone system (RAAS) which is implicated with worse outcomes in COVID-19 infection. Furthermore, Angiotensin-converting enzyme 2 expressions in adipose tissue is higher than in lung tissue, which means that adipose tissue may be vulnerable to COVID-19 infection, so that, the obese population have more adipose tissue and consequently higher ACE2 levels *(Gomar et al.., 2020)*. *Hussain et al. (2020)* reported in meta-analysis study, there is increase of mortality in obese patient infected with COVID-19. Our data confirmed the previous results. This could be attributed to impaired lung functions and increased levels of circulating proinflammatory cytokines, endothelial dysfunction and hypercoagulability associated with obesity.

The impact of co-morbidities is important on the outcomes for COVID-19 patients, helping clinicians to establish risk stratification of COVID-19 patients as early as possible. Diabetes mellitus, hypertension, chronic obstructive pulmonary disease and ischemic heart disease were the most prevalent chronic diseases in our cohort. These findings were similar to a meta-analysis study of *Emami et al. (2020)* who reported that hypertension, cardiovascular diseases, and diabetes mellitus were the most prevalent underlying diseases among hospitalized COVID-19 patients. Also, our study was in agreement with *Ghweil et al., (2020)*. There is a higher risk for COVID-19 among diabetic patients because of the associated dysregulation of angiotensin-converting enzyme 2 *(Marhl et al., 2020)*. Also, our study revealed that the presence of diabetes mellitus could be a significant predictor for mortality of COVID-19 patients. In line with our findings *(Guan et al., 2020*; *Guo et al., 2020*; *Wang et al., 2020* and *Zhou et al., 2020)*, and this could be explained by increased angiotensin-converting enzyme 2 expression, impaired T cell function and increase interlukin-6 *(Singh et al., 2020)*. Glycemic control is important in any patient who has COVID-19. Our study revealed that poor glycemic control had increased risk of death that confirming

previous results of *Zhu et al. (2020)*. In contrast to our study, *Alkundi et al. (2020)* found no difference in mortalities based on the diabetes status, control or complications. These variations may have been due to differences in research methods including sample size and population types.

It has been reported that COVID-19 infection could induce some changes in hematological indices *(Fan et al., 2020)*. In our study, the lymphocytic count and neutrophilic lymphocyte ratio were lower in died cases of COVID-19. Monitoring of such hematologic parameters may help to identify patients who may have a risk for worse outcome. *Ghweil et al. (2020)* reported that lymphopenia is significantly associated with the severity of COVID-19. Our results were consistent with other international data reported by *Fan et al. (2020), Li and Fan (2020)* and *Knights et al. (2020)*. Regarding to white blood cell count and neutrophils, both were within normal ranges in our cohort despite it was higher in died patients. This was in contrast to *Ghweil et al. (2020)* who reported significantly lower mean value of white blood cells which could be due to small sample size of their study.

In the present study, our findings revealed that higher CRP and ferritin among died cases when compared with those who have recovered. It was due to infection with COVID-19 induces acute phase reactant production. These findings were in concordance with *Ghweil et al. (2020), Li and Fan (2020), Liu et al. (2020)* and *Rodriguez et al. (2020)*.

Concerning D. dimer and in the outcome among COVID-19 patients, it is worth noting that our findings suggested associations between D-dimer levels and disease severity and mortality. This was explained by hyperfibrinolysis state and increased inflammatory burden induced in SARS-COV-2 infection. Several reports showed the same findings *(Yao et al., 2020* and *Zhou et al., 2020)*. Also, a result of a systematic review and meta-analysis by *Paliogiannis et al. (2020)* reported that serum D-dimer concentrations in patients with severe COVID-19 are significantly higher. Our data showed that D-dimer levels were significantly correlated with inflammatory markers (CRP, ferritin) in severe cases, highlighting that inflammation considered as a cause of coagulation activation among COVID -19 patients. In contrast to our result, *Wu et al. (2020)* found that D. dimer elevated only in 3 out of 80 patients which could be attributed to that their cases are mild COVID-19 infection, and small number of patients.

Our analysis showed that raised SGPT and SGOT serum levels and low serum albumin levels were associated with severity and mortality among COVID-19 patients. Our findings confirming the previous results by *Alqahtan et al. (2020), Aly et al. (2020), Chen et al. (2020)* and *Ghweil et al. (2020)*. We also found that patients with abnormal liver function had higher inflammatory marker, which may be related to the immune response after virus infection.

We demonstrated that in patients diagnosed with COVID-19, kidney function elevation upon admission was common in died cases. It seems that low-oxygen delivery to kidney in the setting of this disease may lead to ischemic damage of the kidney. Our result was in agreement

with *Qian et al. (2020)*. In contrast to our result, *Ghweil et al. (2020)* reported no significant differences between COVID-19 severity as regards the frequency percentage of creatinine levels, Also, *Wang et al. (2020)* reported that COVID - 19 infection does not result in acute kidney injury. This difference could be explained by the small number of patients in their study.

The median length of hospital stay was about 10-11 days. This was similar to the median length of stay observed in *Guan et al. (2020)*, i.e. 12 days. The length of the stay was longer in *Almazeedi et al. (2020)*, i.e. 18 days. This may be due to difference in discharge criteria.

In terms of radiological images, we determined that 48.04 % of patients had a normal X-ray as reported by a radiologist. This was in agreement with *Wong et al. (2020)* who reported that 31% of COVID-19 had normal initial chest X-ray. In contrast to our study, *Almazeedi et al. (2020)* reported that 76.3% had normal X-ray. These variations may have been due to most of included subjects in their study were asymptomatic or have mild symptoms. In our study, there were radiological findings in CT chest of all patients. These findings raise the concern whether X- ray chest is enough as diagnostic image in COVID-19 patients. Regarding to CT chest, our results showed that the findings were bilateral peripheral ground glass opacity among patients who recovered from COVID- 19 infection, while in non-survivor cases their CT chest revealed a crazy-paving appearance. So, CT chest findings were a predictor in the severity and mortality of COVID-19 infection. The same findings were reported by multiple studies *(Ghweil et al., 2020*; *Majidi & Niksolate 2020*; *Song et al., 2020* and *Wang et al., 2020).*

The overall mortality rate is different between studies, as it depends on many factors like age, severity of COVID-19 infection and associated comorbidities of included individuals. In our cohort, mortality rate was higher than *Almazeedi et al. (2020)* and *Guan et al. (2020)* who reported 1.7% and 1.4% respectively. This may reflect that, included patients in these studies were asymptomatic or have had milder symptoms. But our mortality rate was much lower than the other large retrospective cohort studies, i.e. *Wu et al. (2020)* showed 21.9% mortality and *Zhou et al. (2020)* showed 28.3% mortality. This heterogeneity is probably due to differences in the case inclusion criteria. However, our results were closer to the mortality rate indicated by official national statistics.

CONCLUSION

Measuring temperature is not an effective screening tool for COVID-19. Age, Obesity, co-morbidities, lymphopenia, increase inflammatory marker and elevated D. dimer could be used as a predictor of outcome in COVID-19 patients.

Our study suffered from the usual limitations of the small sample. The relatively small number of mortality patients in this study limited the statistical power of the analysis.

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مدى تأثير فيروس كورونا -١٩ المستجد في المرضي المصريين

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خلفيـــة البحـــث: يعـــد مـــرض فيـــروس كورونـــا 19- المســـتجد، النـــاجم عـــن متلازمـــة الجهـــاز التنفســـي الحـــادة الوخيمـــة، وبـــاءً مســـتمراً أصـــاب بالفعـــل ملايـــين المرضـــى فـــي جميـــع أنحـــاء العـــالم، ويـــرتبط بشـــكل كبيـــر بعـــدد مـــن المراضة والوفيات.

الهـــدف مـــن البحـــث: توصـــيف المظـــاهر والنتـــائج الســـريرية لـــفيروس كورونا 19- المستجد في المرضى المصريين.

المرضـــى وطـــرق البحـــث: أجريـــت هـــذه الدراســـة علـــى ثلاثمائـــة وثلاثـــة وثلاثـــين مريضـــا يعـــانون مـــن فيـــروس كورونـــا 19-المســـتجد. وقـــد تـــم تشـــخيص المرضـــى المصـــابين بفيـــروس كورونـــا المســـتجد عـــن طريـــق أخـــذ مســـحة مـــن الحلـــق واللـــوزتين لمعرفـــة الحمـــض النـــووى الخـــاص بـــالفيروس، بالإضـــافة إلـــى التحاليـــل المعمليـــة الأخـــرى مثـــل صـــورة الـــدم وكـــذلك عـــن طريق الأشعة العادية والمقطعية.

نتـــائج البحـــث: كـــان متوســـط أعمارحـــالات الوفيـــات (66.4±17.4)، بينمـــا كـــان متوســـط أعمـــار حـــالات الشـــفاء(40.3 ± 14.9)، وكـــذلك كانـــت نســـبة الأمـــراض المزمنـــة فـــى حـــالات الوفيـــات تمثـــل 89.5 %، بينمـــا كانـــت نســـبة الأمـــراض المزمنـــة فـــى حـــالات الشـــفاء 38.5 %، وتبـــين ان الأعـــراض

الشـــائعة المصـــاحبة لمرضـــى فيـــروس كورونـــا 19- المســـتجد تتمثـــل فـــى الســـعال والتـــى مثلـــت نســـبة 82.6 %، وكـــذلك إرتفـــاع درجـــة الحـــرارة والتـــى تمثل 51.7 % بينما مثلت صعوبة التنفس 23.4%.

الاســـتنتاج: يمكـــن اعتبـــار العمـــر، والســـمنة، و نقـــص الخلايـــا الليمفاويـــة، ومعامـــل D. dimer ، ونتـــائج التصـــوير المقطعـــي علـــى الصـــدر وغيرهـــا مـــن الأمـــراض المصـــاحبة مؤشـــرا علـــى النتـــائج بـــين مرضـــى فيـــروس كورونا 19- المستجد.

الكلمـــات الدالـــة: كوفيـــد -19، مصـــر، التوصـــيفات الســـريرية، مؤشـــرات الدم، علامات الالتهاب، الوفيات.