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COVID 19: Incidence and Treatment Outcome in Pakistan: A Case Study of a Private Hospital of Karachi

Gulnaz Elahi[1*], Irfan Elahi[2], Ikram Ul Haq[3]

[1]Quality Manager, Dr. Essa Laboratory & Diagnostic Center, Karachi Pakistan
[2]Cardiac Thoracic Surgeon, Mater Misericordiae University Hospital, Dublin, Ireland
[3]College of Dentistry, King Saud bin Abdulaziz University for Health Sciences, King Abdullah International Medical Research Center, and Riyadh, Saudi Arabia

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***Corresponding author:** Gulnaz Elahi

Abstract **Original Research Article**

Objectives of the study: To find out the incidence of Covid 19 in patients reporting to a tertiary care private hospital set up and to find out its treatment outcome. ***Methodology: Study Design*:** Descriptive cross sectional six months' study conducted in a private hospital, Karachi, Pakistan. Non-probability convenient consecutive sampling was used for the study. A total of 367 patients reported to the OPD of the hospital were included for the study who were screened during the study period. Out of these, 328 (89.4%) patients were found Covid 19 positive. ***Inclusion and Exclusion Criteria*:** Patients complaining of fever, dry cough and tiredness were further checked and interrogated for other symptoms e. g. aches and pains, sore throat, diarrhea, conjunctivitis, headache, loss of taste and smell, skin rash, discoloration of fingers or toes. Once these symptoms were found to be present investigation further continued with the diagnostic tests. Patients who did not come under the inclusion criteria were excluded from the study. ***Research Procedure:*** The following tests were conducted for further confirmation: Rapid antigen test, COVID PCR, COVID Antibodies, Chest X-ray, HRCT - CT scan of the chest, inflammatory Markers - (Ferritin, LDH, Dimers). ***Conclusion:*** COVID 19 pandemic is an unprecedented crisis and it has altered the lifestyles of people. Out of the total suspected cases 89.4% were confirmed for Covid 19 and the cure rate was 87%, while the death ratio was recorded 2.5%.

Keywords: Covid 19, Coronavirus, Pakistan, Pandemic.

INTRODUCTION

Background

Covid 19 has become a pandemic worldwide. It attacks with the respiratory system having breathing problem. Older people suffering from other long term diseases like diabetes, cardiac problems are more vulnerable to the disease [1]. Sauer [2] is of the opinion that the disease is spread through the droplets of sneezing and cough. The infection started from China in December 2019 and rapidly spread widely engulfing almost the entire world within the first few months [3].

Symptoms include cough, breathing problems, fever, tiredness, headache, body pain etc. [4]. Additionally loss of taste and smell, dry throat, stuffy nose, nausea or diarrhea etc. have also been reported. The symptoms appear within the first 2-14 days after infection. Prevention includes social distancing of six feet, washing of hands for twenty seconds or more, use of sanitizer and wearing of face masks [5]. Severity and duration is age and immunity dependent. The more frequent symptoms include fever 99%, tiredness 70%, cough and sneeze 59%, loss of taste and smell 40%, body pain 35%, respiratory problems 31% and mucus 27% [6].

Morbidity and Mortality

According to WHO the disease is going to remain for some time and decrease in incidence is not in sight. The most affected countries are USA, India, Brazil, Russia, UK, France, Spain, Italy, Turkey and Germany [7, 8]. High mortality was recorded beside India, Yemen, Mexico, Syria, Sudan, Egypt, Ecuador, China, Bolivia, Afghanistan, Liberia and Bulgaria [9, 10]. Another list that included the mortality with reference to population was as follows. In addition to India the following countries were reported Belgium, Slovenia, UK, Czechia, Italy, Portugal, Bosnia, USA, North Macedonia, Hungary and Spain [11, 12]. In view of the gravity of the situation it is vital that some concrete plan of action is devised [13].

In Pakistan the new wave has increased the fatality but measures taken by the government is producing results in reducing the incidence and mortality [14]. In addition to its health hazards, it has its negative impact on economy as well. The global economy has undergone recession and it is expected that it will take a number of years before things get corrected [15-17].

The WHO recommended precautionary measures should be adopted by all countries to limit the incidence and severity of the disease. Major precautions that should be taken are: Social distancing 9six feet), washing hands with soap for twenty seconds or more, use of sanitizers, avoiding crowds and congestive gatherings. Also not to touch eyes, nose and mouth without cleaning hands with soap or sanitizer. If symptoms show one should isolate and quarantine one self. While sneezing cover nose and mouth with elbow and dispose the tissue safely preferably in dustbin. In case of fever and cough a doctor should be consulted for evaluation of the symptoms [18, 19]. The government of Pakistan gave lock down a augmented version, the smart lock down indicating strict lock down in infected locality while relaxing a bit in other localities. However, WHO recommended strict lock down in their recommendations [20]. Although vaccine has been made available but since its effectiveness in prevention is yet to be ascertained, it is recommended that all WHO recommended precautionary measures should be undertaken till further updates in this regard [21, 22]. The crucial problem with Covid 19 is its unprecedented spread widely and quickly. Although some remedial measures have been recommended that include antibiotics also but their roles in cure or minimizing the impact has not been established yet [23, 24].

Operational Definitions,

1. Rapid Antigen Test: It is a diagnostic test for Covid 19 that detects the presence of absence of antigen. In this test nasopharyngeal swab is taken and the result is obtained in 12 hours.
2. COVID Antibodies Test: It is a serology test that looks for antibodies and indicates infection, in this case used for Covid 19.
3. HRCT: High Resolution CT (HRCT) of the lung. It uses the CT technique for thin slice chest images.

MATERIALS AND METHOD

Following were the objectives of the present study:

- To find out the incidence of Covid 19 in patients reporting to a tertiary care private hospital set up
- To find out the treatment outcome of the disease

Study Design: Descriptive cross sectional study

Settings: The study was conducted at Imam Hospital, North Nazimabad, Karachi, Pakistan.

Duration of the Study: Six months from August 2020 to January 2021.

Sampling procedure: Non-probability convenient consecutive sampling. All patients reporting to the emergency or general OPD of the hospital requesting for Covid 19 test or those who were suspected by the attending doctors at the emergency or general OPD were screened for Covid 19. A total of 367 patients were included for the study who were screened during the study period. Out of these 328 patients were found Covid 19 positive.

Inclusion Criteria

- Patients complaining of fever, dry cough and tiredness were further checked and interrogated for other symptoms e. g. aches and pains, sore throat, diarrhea, conjunctivitis, headache, loss of taste and smell, skin rash, discoloration of fingers or toes.
- Once these symptoms were found to be present investigation continued on the following: chest pain, shortness of breath or difficulty in breathing, speech difficulty, difficulty in movement.

Exclusion Criteria: Patients who did not come under the inclusion criteria.

The following tests were conducted for further confirmation

1. Rapid Antigen Test - nasopharyngeal swab was taken, test results came within 1-2 hours.
2. COVID PCR - nasopharyngeal swab was taken, test results came in 12 hours
3. COVID Antibodies - blood sample taken. The test indicated that a person has recently been infected with the virus. Positive antibodies are not a clear indication that the infection has resolved, the person might still be infective.
4. Tests for prognosis: chest x-ray, HRCT - CT scan of the chest. Most suggestive finding is the ground glass appearance of lungs and infiltrates. Percentage of lung involvement is seen
5. Inflammatory Markers - (Ferritin, LDH, Dimers,) If these markers are raise, it indicates that the patient is in Cytokine Release Syndrome (CRS) and the prognosis is poor.

Patients having mild symptoms were advised to stay at home in isolation and manage the symptoms according to the doctor's advice. Infection was confirmed with in five to six days. Some also took up to two weeks.

RESULT

A total number of patients were screened 367, and the total number of patients found positive for Covid 19 was 328. The incidence ratio was found 89.4%, out of the suspected cases. Eighty-seven (n=319) of the patients were cured, while 9 (2.5%) patients were died.

The reliability statistics of Cronbach's Alpha of .954 and Cronbach's Alpha Based on Standardized Items of .963 say that the research is reliable up to 95.4% and 96.3% respectively (Table-1).

Table-1: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
.954	.963	14

Gender wise analysis showed that 63.8% were male and 36.2% were females with the age group, 40.1% patients were 50–59 years, 28.3% were of 40-49 years and 18% of 60 years and above.

The major signs and symptoms were as follows: dry cough 96.46%, aches and pain 94.1%, headache 89.65%, tiredness 89.65%, loss of taste and smell 89.1%, sore throat 86.1%, shortness of breath 67.03%, skin rash 62.94% and chest pain 55.31%. Other signs and symptoms were having less than 50% frequency (Table-2).

Table-2: Signs and Symptoms

Signs and Symptoms	Numbers	%
Dry cough	354	96.46
Aches and pain	345	94.01
Headache	329	89.65
Tiredness	329	89.65
loss of taste and smell	327	89.10
Fever	321	87.47
Sore throat	316	86.10
shortness of breath	246	67.03
skin rash	231	62.94
chest pain	203	55.31
speech difficulty	197	53.68
difficulty in movement	162	44.14
Conjunctivitis: 127	127	34.60
Diarrhea	106	28.88
discoloration of fingers or toes	54	14.71

Comorbidity was as follows: hypertension 59.13%, diabetes 53.68%, pneumonia/bronchitis 41.96%, cardiac diseases 23.71%, arthritic and joint diseases 21.25%, Alzheimer disease 20.98% and cancer 17.17% (Table-3).

Table-3: Comorbidity

Comorbidity	Numbers	%
Hypertension	217	59.13
Diabetes	197	53.68
Pneumonia/bronchitis)	154	41.96
Cardiac Disease	87	23.71
Arthritic and joint diseases	78	21.25
Alzheimer disease	77	20.98
Cancer	63	17.17

In Rapid Antigen Test 82.8% were positive and 17.2% were negative. In Covid PCR Test 62.4% were positive, 23.4% were false positive, 10.6% negative and 3.5% false negative. In PCT Test 81.5% from the severe group had 0.06 - 0.29 ng/mL, 12.8% of moderate group had 0.05 or less ng/mL, 5.7% of the critical group had 0.30 - 0.50 ng/mL. In Covid Antibodies Test 79.6% were positive, 10.6% were negative and 9.8% were equivocal. In chest x-ray 72.2% showed ARDS Pan lobar pattern of lung involvement, 15% showed ill-defined consolidation in lower lobes and 12.8% were normal. In HRCT Test 36% had consolidation with air-bronchogram, 25.1% had sub-pleural consolidation, 22.6% had displayed reticulations, 13.9% had isolated ground glass appearances and 2.5% had pleural effusion. In inflammatory markers (Ferritin Test) 52.3% (males) were outside normal range, 31.1% (females) were outside normal range, 11.4% (male) were within normal range and 5.2% (females) were within normal range. In CRP 83.9% had 10 - 50mg/L, 13.1% had 0-10mg/L and 3% had More than 50mg/L. In LDH 88.3% had more than 280U/L and 11.7% had 140-280 U/L. In D Dimers 86.9% had 0.5 -2.0 ug/ml (Covid positive), 2.5% had more than 2.0 ug/ml (Covid positive), 10.6% had below 0.5 (Covid negative).

Out of total patients 89.4% were diagnosed having Covid 19, while 10.6% were cleared as having not the infections. 61.9% patients were cured after one month, 25.1% were cured after 45 days, 2.5% patients died. 10.6% were not suffering from Covid 19 and were declared clear.

Table-4 presented that in Regression analysis (Diagnosis), the values of R, R2 and adjusted R2 were .975, .951 and .949 indicate that the independent variables support the dependent variable up to the extent of 97.5%, 95.1% and 94.9% respectively. The value of Durbin Watson .411 indicates that there is a

very strong positive relationship between the independent variables and the dependent variable. The sig value (or p value) zero indicates that the result is significant.

Table-4: Regression Analysis (Diagnosis) Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson	P value/ sig value
					R Square Change	F Change	df1	df2	Sig. F Change		
1	.975[a]	.951	.949	.15362	.951	569.695	12	354	.000	.411	0
a. Predictors: (Constant), D DIMERS, RAPID ANTIGEN TEST, GENDER, CHEST X RAY, LDH, PCT TEST, AGE, COVID ANTIBODIES TEST, HRCT TEST, CRP, COVID PCR TEST, INFLAMMATORY MARKERS: FERRITIN TEST											
b. Dependent Variable: DIAGNOSIS											

In Regression analysis (Treatment) (Table 5), the values of R, R2 and adjusted R2 were .995, .991 and .949 indicate that the independent variables support the dependent variable up to the extent of 99.5%, 99.1% and 94.9% respectively. The value of Durbin Watson .593 indicates that there is a very strong positive relationship between the independent variables and the dependent variable. The sig value (or p value) zero indicates that the result is significant.

Table-5: Regression Analysis (Treatment) Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson	P value/ sig value
					R Square Change	F Change	df1	df2	Sig. F Change		
1	.995[a]	.991	.990	.09427	.991	2903.709	13	353	0.000	.593	0
a. Predictors: (Constant), DIAGNOSIS, LDH, RAPID ANTIGEN TEST, PCT TEST, D DIMERS , AGE , CHEST X RAY, GENDER, COVID ANTIBODIES TEST, CRP, HRCT TEST, COVID PCR TEST, INFLAMMATORY MARKERS: FERRITIN TEST											
b. Dependent Variable: TREATMENT OUTCOME											

In Table 6, cross tabulation has been done between diagnosis and treatment. 61.9% of the patients were cured after one month, 25.1% were cured after 45 days while 2.5% patients died.

Table-6: Treatment Outcome* Diagnosis Crosstabulation

			DIAGNOSIS			Total	PEARSON CHI SQUARE	
			Confirmed at Stage I	Confirmed at stage II	Not confirmed / clear		Exact Sig. (2-sided)	Exact Sig. (1-sided)
TREATMENT OUTCOME	Complete cure after one month	Count	227	0	0	227	0	0
		% of Total	61.9%	0.0%	0.0%	61.9%		
	Complete cure after 45 days	Count	0	92	0	92		
		% of Total	0.0%	25.1%	0.0%	25.1%		
	Death	Count	0	9	0	9		
		% of Total	0.0%	2.5%	0.0%	2.5%		
	Unconfirmed (clear) cases	Count	0	0	39	39		
		% of Total	0.0%	0.0%	10.6%	10.6%		
Total		Count	227	101	39	367		
		% of Total	61.9%	27.5%	10.6%	100.0%		

DISCUSSION

World is now conversing to find a way to curb the spread of this lethal virus. Work is being done to develop some vaccine, or at least medicines that slow down virus in a person. Work is being done to understand how this virus spread and restricting it from increasing is in WHO's top list [25]. The role of health workers and doctors is crucial in reducing the spread of this pandemic. Also providing of information on how to prevent spread of virus or curing it also essential for volunteers like tiger force in Pakistan [26].

WHO categorized COVID 19 a pandemic and soon Pakistan two biggest provinces Sindh and Punjab were the worst affected by the virus. Research told that the situation was worse in Punjab where health emergency was declared and people were advised to avoid communal meetings and observe social distancing [27].

Corona issue needs proper attention and smart handling of the situation or things can quickly become unmanageable and uncontrollable. Smart lockdown was thought to be best solution, if observed along with SOPs [28].

To fight the corona virus immune system should be strong and anti-bodies should be produced to counter the RNA virus. Good diet, precautions and self-isolation can help prevent and cure the virus [29]. Super powers like America is among worst victims of this pandemic and feel it is like facing an unknown enemy and being attacked as if in a state of combat. Lerer [30] wrote many lost jobs in US and United Kingdom's economy was worst hit by pandemic.

In recent days the cases are dropping, the reason may be that people are getting immune through previous infection, vaccination, preventive measures or development of immunity and resistance. The author discussed Rwanda phenomenon. In Rwanda a population of more than 12 million, only 133 deaths were recorded from Covid 19 during a period of ten months. The author mentioned that the key factor for this low death rate was the infection control strategies. This included social support like delivering food and water for poor people in quarantine or isolated patients [31]. Such strategies compares well with the Pakistani government's program in which the government gave Rs. 12,000 to each household during the initial phase of Covid 19 spread.

CONCLUSION

COVID 19 pandemic is an unprecedented crisis and it has altered the lifestyles of people. It has changed the economies, the way people live, interacts, commutes and has halted the normal lives of people. Out of the total suspected cases 89.4% were confirmed for Covid 19. Cure rate was 87% and death rate was recorded 2.5%.

Precautionary measures include social distancing, movement should be restricted as much as possible, hands should be washed whenever coming from outside or touching any infected patient, use of sanitizers, face masks should be used whenever visit outside or in public places.

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