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Chest X-Ray Findings in Symptomatic Patients Positive for Covid-19

Fatima Jamil [1], Syed Muhammad Yousaf Farooq[1], Muhammad Zakir[1], Aweesha Nameen[1], Sonia Shahzadi [1], Memoona Ramzan[1], Muqadas Batool[1], Lina Khaled Jallad[2]

[1]University Institute of Radiological Sciences & Medical Imaging Technology, The University of Lahore, Pakistan.

[2]Radiography & Medical Imaging, Fatima college of health sciences, United Arab Emirates.

Correspondig Author: Syed Muhammad Yousaf Farooq

Abstract

Background: The flare-up of Covid started as pneumonia of obscure reason in December 2019 in Wuhan, China, which has been currently spreading quickly out of Wuhan to different nations. On Walk 11, 2020, the WHO reported Covid as pandemic. Covid is believed to be expanding in Pakistan. The principal instance of Covid was accounted for from Karachi on February 26, 2020, with assessed people of Pakistan as 204.65 million. Progressively, the infection spreads into different locales across the country.

Objective: To find out the Chest X-ray findings in symptomatic patients positive for Covid-19.

Methodology: A descriptive study was conducted at Department of radiology, Farooq Hospital Lahore. 150 patients of different age groups were enrolled in this study with convenient sampling technique. Out of 150 patients 85 were males and 65 were females and they were with the history of cough, smoking, loss of smell, low oxygen saturation, and hypertension and remaining were normal. We included only those patients in this study which were symptomatic and have positive PCR of Covid-19 virus while the asymptomatic were excluded.

Results: All 150 patients were with the history of positive PCR of covid and were symptomatic. 85 (56.7%) males and 65 (43.3%) females were enrolled in this study. Out of 150 patients 54 (63%) patients were with the history of fever, 103 (68.7%) were with the history of diabetes, 54 (36%) were with the history of hypertension, 57 (38%) were with the history of smoking, 69 (46%) were with the history of cough, and all patients were with the history of loss of smell. In this study different age groups were selected. The mean value of age was 1.313 and SD ±16.078. On X-ray 87 (58%) shows Air Space Opacification, 98 (65.3%) shows Inflammatory Process, 46 (30.7%) shows Ground Glass Appearance, 52 (34.7%) shows Consolidation, 9 (6%) shows Pleural effusion, 15 (10%) has cardiomegaly, 15 (10%) has bronchitis and 8 (5.3) has pulmonary edema.

Conclusion: The chest X-ray is the basic modality for identifying patients with COVID-19 pneumonia and it is especially useful due to its low cost and low radiation exposure. Early changes in the lung parenchyma and consolidation and hazy pattern can be detected and that will help to reduce the rate of hospitalization due to Covid-19.

Key words: Chest X-ray, Covid-19

Introduction

The occasions of ongoing months have changed various things. At the point when the COVID19 plague had recently begun in December 2019. Crown (Coronavirus) is an infectious sickness brought about by the SARS-CoV-2 virus. [1]Most individuals who become sick with Coronavirus not have serious side effects and recuperate without unique therapy. In any case, a few patients will require clinical consideration. It before long spread all over the planet and changed our impression of globalization and digitization forever.[2]As numerous nations all over the planet were secured, worldwide travel were boycott, and organizations and ventures are battling to keep up, new open doors and difficulties are arising. One of the most fascinating impacts of pandemics should be visible in higher education. [3-5]

On January 8, 2020, a logical article was submitted for distribution in the Diary of Movement Medication about pneumonia in obscure etiology, which was distinguished in patients in Wuhan, China, and its spread through business air travel. The odds were high. In which circuitous 40 pneumonia cases were accounted for from Wuhan city of China. On January 8, 2020, this type of pneumonia was named Crown virus. [6] Clinical examinations and the qualities of the impacted patients became exposed soon after. [7] Radiology assumed a significant part in the start of this pandemic circumstance. Chest X-beam considered delicate in beginning phase in beginning. [8] Through this, specialists had the option to separate from Coronavirus patients. Because of chest X-beam specialists observed quick movement of lung irregularities in contaminated patients, especially in emergency unit). Be that as it may, this methodology couldn't recognize pneumonic contribution in early stage. [9-11]

Coronavirus patients got explicit radiological discoveries on chest imaging, including multifocal and reciprocal ground glass haziness and adjustment with fringe and basal predominance. Bronchiectasis, Septal thickening, lymphadenopathy, pleural radiation and cavitation were less regularly seen. [12-15] Currently, chest tomography imaging is viewed as the best strategy for distinguishing lung irregularities in beginning phase illness and quantitative analysis of the seriousness and movement of Coronavirus pneumonia. [16]

Purpose:

The purpose of this study is to describe the most common manifestations and patterns of lung abnormality on CXR in COVID -19 in order to equip the medical community in its efforts to combat this pandemic.

Method

A descriptive study was conducted at Department of radiology department Farooq Hospital Lahore. 150 patients were enrolled in this study with convenient sampling technique. Out of 150 patients 85 were males and 65 were females and they were with the history of cough, smoking, loss smell, low oxygen saturation, and hypertension and remaining were normal. We included only those patients in this study which were symptomatic and have positive PCR of Covid-19 virus while the asymptomatic were excluded. X-ray Chest was performed in erect PA position with hands on the back of patient. Guide the patient to take a deep breath in and then hold for few seconds. Images were visualized on computer screen for reporting. Data was collected by a data collection sheet. Data was collected according to the variables like Age, gender and X-ray findings. Data was evaluated and analyzed with SPSS version 21, Microsoft Excel 2013. The quantitative data (gender) was presented in the form of descriptive statistics, mean ±S.D, and qualitative data was presented by percentage, frequency and bar charts or pie charts. Collected data was stored in Microsoft Excel.

Results

All 150 patients were with the history of positive PCR of covid and were symptomatic. 85 (56.7%) males and 65 (43.3%) females were enrolled in this study. Out of 150 patients 54 (63%) patients were with the history of fever, 103 (68.7%) were with the history of diabetes, 54 (36%) were with the history of hypertension, 57 (38%) were with the history of smoking, 69 (46%) were with the history of cough (Table 2), and all patients were with the history of loss of smell. In this study different age groups were selected. The mean value of age was 1.313 and SD ± 16.078. On X-

ray 87 (58%) shows Air Space Opacification, 98 (65.3%) shows Inflammatory Process, 46 (30.7%) shows Ground Glass Appearance, 52 (34.7%) shows Consolidation, 9 (6%) shows Pleural effusion, 15 (10%) has cardiomegaly, 15 (10%) has bronchitis and 8 (5.3) has pulmonary edema (Table 1). Out of 54 patients having history of pneumonia 92.6% had Air space Opacification, 79.6% had inflammatory process, 42.6% had Ground glass appearance, 31.5% had Consolidation, 5.6% had Cardiomegaly, 3.7% had Bronchitis and 3.7% had pulmonary edema(Table 3).

Table 1: Frequencies and percentages of Pathologies detected on X-ray

	Air Space Opacification	**Ground Glass Appearance**	**Consolidation**	**Pleural effusion**	**Cardiomegaly**	**Bronchitis**	**Pulmonary edema**
No	63 (42%)	104 (69.3%)	98 (65.3%)	141 (94%)	15 (90%)	15 (90%)	8 (5.3%)
Yes	87 (58%)	46 (30.7%)	52 (34.7%)	9 (6%)	135 (10%)	135 (10%)	142 (94.7%)

On X-ray 87 (58%) shows Air Space Opacification, 98 (65.3%) shows Inflammatory Process, 46 (30.7%) shows Ground Glass Appearance, 52 (34.7%) shows Consolidation, 9 (6%) shows Pleural effusion, 15 (10%) has cardiomegaly, 15 (10%) has bronchitis and 8 (5.3) has pulmonary edema.

Table 2: Frequencies and percentages of symptoms

	Fever	**Cough**	**Diabetes**	**Hypertension**	**Smoking**	**O.S**	**Loss of smell**
No	96(64%)	81(54%)	47(31%)	96(64%)	93(62%)	0	0
Yes	54(36%)	69(46%)	103(68%)	57(38%)	57(38%)	150(100%)	150(100%)

Out of 150 patients 54 (63%) patients were with the history of fever, 103 (68.7%) were with the history of diabetes, 54 (36%) were with the history of hypertension, 57 (38%) were with the history of smoking, 69 (46%) were with the history of cough, and all patients were with the history of loss of smell.

Table 3: Frequencies and percentages of Pathologies detected on X-ray and its cross tabulation with Pneumonia

Pneumonia	Air space Opacification		Ground glass appearance		Consolidation		Pleural Effusion		Cardiomegaly		Bronchitis		Pulmonary edema	
	No	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**
No	59 (61.5%)	37 (38.5%)	73 (76%)	23 (24%)	61(63.5%)	35(36.6%)	87 (90.6%)	9 (9.4%)	84 (87.5%)	12(12.5%)	83 (86.5%)	13 (13.5%)	90 (93.8%)	6 (6.3%)
Yes	4 (7.41%)	50 (92.6%)	31(57.4%)	23 (42.6%)	37(68.5%)	17(31.5%)	54 (100%)	0	51(94.4%)	3 (5.6%)	52 (96.3%)	2 (3.7%)	52 (96.3%)	2 (3.7%)

Out of 54 patients having history of pneumonia 92.6% had Air space Opacification, 79.6% had inflammatory process, 42.6% had Ground glass appearance, 31.5% had Consolidation, 5.6% had Cardiomegaly, 3.7% had Bronchitis and 3.7% had pulmonary edema.

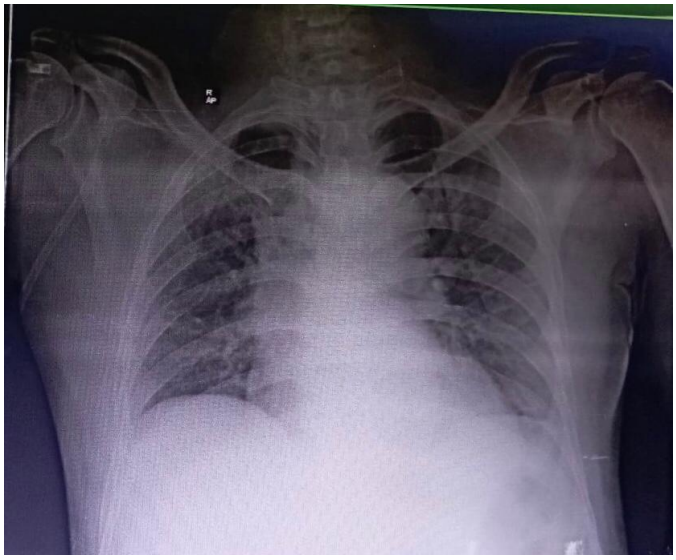

Image 1: x-ray image show lungs of PCR positive patient with bilateral fibrotic lungs.

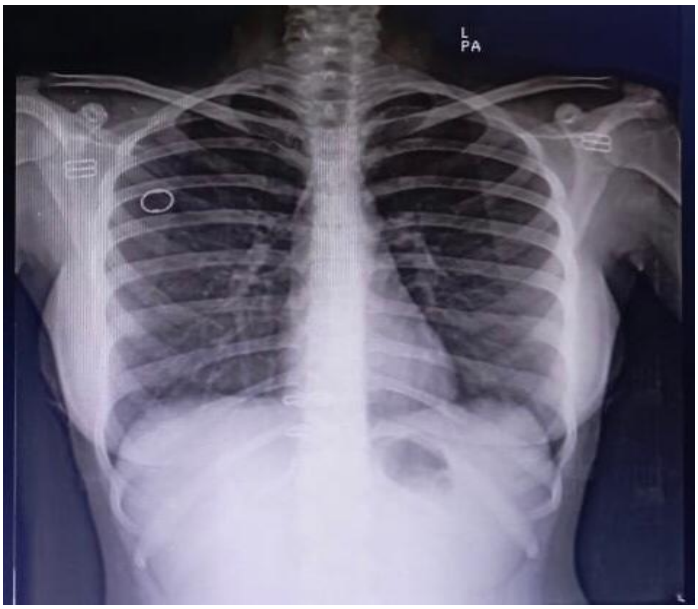

Image 2: X-ray image show lungs of PCR positive patient with Ground glass appearance

Discussion

All 150 patients were with the history of positive PCR of covid and were symptomatic. 85 (56.7%) males and 65 (43.3%) females were enrolled in this study. Out of 150 patients 54 (63%) patients were with the history of fever, 103 (68.7%) were with the history of diabetes, 54 (36%) were with the history of hypertension, 57 (38%) were with the history of smoking, 69 (46%) were with the history of cough, and all patients were with the history of loss of smell. In this study different age groups were selected. The mean value of age was 1.313 and SD ± 16.078. On X-ray 87 (58%) shows Air Space Opacification, 98 (65.3%) shows Inflammatory Process, 46 (30.7%) shows Ground Glass Appearance, 52 (34.7%) shows Consolidation, 9 (6%) shows Pleural effusion, 15 (10%) has cardiomegaly, 15 (10%) has bronchitis and 8 (5.3) has pulmonary edema.

Ozturk T et,al directed a review Chest CT sweep and chest x-beams show trademark radiographic

discoveries in patients with Coronavirus pneumonia. The review targets depicting the chest x-beam discoveries and fleeting radiographic changes in Coronavirus patients. A sum of 88 patients (50 (56.8%) females and 38 (43.2%) guys) were owned up to the medical clinic with affirmed Coronavirus. Their age went from 3 to 80 years (35.2 ± 18.2 years). 48/88 (45%) were indicative, just 13/88 (45.5%) showed unusual chest x-beam discoveries. A sum of 190 chest x-beams were gotten for the 88 patients with a sum of 59/190 (31%) unusual chest x-beams. The most well-known finding on chest x-beams was fringe ground glass opacities (GGO) influencing the lower curves. Throughout sickness, the GGO advanced into unions topping around 6-11 days (GGO 70%, combinations 30%). The unions relapsed into GGO towards the later period of the sickness at 12-17 days (GGO 80%, solidifications 10%). There was expansion in the recurrence of ordinary chest x-beams from 9% at days 6-Close to half of patients with Coronavirus have unusual chest x-beam discoveries with fringe GGO influencing the lower curves being the most widely recognized finding. Chest x-beam can be utilized in finding and follow up in patients with Coronavirus pneumonia.11 up to 33% following 18 days demonstrating a recuperating stage. The greater part (12/13, 92.3%) of patients with strange chest x-beams were symptomatic. [17]

Hassantabar S et.al reasoned that Patients that had a RT-PCR positive for Coronavirus disease were 234 altogether: 153 guys and 81 females, with a mean age of 66. Thirteen CXRs were negative, yet the excess changes were for the most part noticed. In Coronavirus, CXR shows complicated or diffuse reticular-nodular darkness and dependability with basal, fringe, and two-sided edges. As far as they can tell, pattern CXR had a responsiveness of 68.1%. The RALE score can be utilized as a quantitative proportion of the degree of SARS-CoV-2 pneumonia in a crisis setting, which is connected with the expanded gamble of ICU confirmation. Be that as it may, in our review, we closed positive for Coronavirus disease were 150 altogether: 85 guys and 65 females and all x-beams were positive. They noted ground glass opacities with two-sided edges mostly. [18]

Basu S et.al reasoned that by far most of CXR showed anomalies in youngsters with Coronavirus. Be that as it may, discoveries are vague. Interobserver relationship was great in depicting unions, typical x-beams and GGOs. Imaging methods play a part in the administration of youngsters with known or thought Coronavirus, particularly in those with moderate or serious side effects or with basic gamble factors. Nonetheless, they additionally concentrated on sure x-beam discoveries with the base age of 2 months showed bronchitis. [19]

Cohen JP et.al led a concentrate in which they expressed that by far most of patients (566/636) had either typical or just somewhat strange CXRs (89%), notwithstanding being sufficiently suggestive to warrant not set in stone by the treating UC supplier. CXRs got from affirmed and suggestive Coronavirus patients introducing to the UC were typical in 58.3% of cases, and typical or just somewhat strange in 89% of patients. At the point when strange, the most well-known discoveries were available in the lower curves and the example was interstitial and additionally multifocal. Pleural emissions and lymphadenopathy were phenomenal. In any case, in our review, all patients had unusual CXRs, all being suggestive. The most well-known discoveries were ground glass appearance. Pleural radiation was phenomenal finished up 6%. A X-beam is worked to look at thick tissues, while a CT examine is better ready to catch bones, delicate tissues and veins all simultaneously. X-beam hardware is a lot more modest and less complicated than a CT filter since a CT scanner necessities to pivot around the patient being examined. Chest X-beam is a decent minimal expense, first-look test. To push ahead with your conclusion and treatment, you could need to do a chest CT output to have a superior picture.[20]

Conclusion:

The chest X-ray is the basic modality for identifying patients with COVID-19 pneumonia and it is especially useful due to its low cost and low radiation exposure. Early changes in the lung parenchyma and consolidation and hazy pattern can be detected and that will help to reduce the rate of hospitalization due to Covid-19.

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