Original Research Paper

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Radio-Diagnosis

CORRELATION OF CHEST X RAY FINDINGS IN COVID 19 AN OBSERVATIONAL RETROSPECTIVE STUDY

Dr.P.V.Srirama Chandra Murthy	Assistant Professor, Department Of Radiology, Siddhartha Medical College, Vijayawada.
Dr.Bakka Sarada*	Associate Professor, Department Of Radiology, Siddhartha Medical College, Vijayawada.*Corresponding Author
Dr. N Gopichand	Professoer, Department Of Pulmonary Medicine Siddhartha Medical College Vijayawada.
Dr.Durgaprasad.S	Professoer, Department Of General Medicine, Siddhartha Medical College Vijayawada.

ABSTRACT **Background:** Covid19 infection is highly infectious & rapidly spreading disease, due to limited availability of microbiological methods at early stages, radiological methods can be used for diagnostic purpose, mainly Chest-X-ray , even though of less sensitive and specific.

Materials And Methods: It is a retrospective study done in GGH Vijayawada, with RTPCR positive patients wit age more than or equal to 18 years as inclusion criteria , and excluding RTPCR negative and age less than 18 years. Chest X-rays are done using digital radiograph and analysed by radiologists.

Results: Out of 200 patients who were admitted 27% belong to mild,41 %belong to moderate,64% belong to severe stage of disease with male predominance 58.5% ,and predominant age group was 41-60years. Chest-X-ray study showed consolidation, infiltrates, pleural effusion and normal study of 43%, 28%, 8%, 21% respectively.

Discussion: The diagnosis and treatment are important in preventing the covid 19 infected patient to have severe stage of disease. Most of the patients who are affected with covid 19 have lung parenchymal involvement leading to pneumonia and landing the patient in respiratory failure. In most of the studies predominantly consolidations, followed by infiltration , pleural effusion as different pattern of lung involvement and in some normal chest-x-ray also seen initially at the time of presentation. For treatment and prognostic purposes HRCT chest is preferred but because of cost and burden Chest-x-ray is preferred.

Conclusion: covid 19 can be treated effectively if diagnosed early, so the diagnostic methods should be easily approachable, less cost effective .one of such method is Chest x ray which will be helpful.

KEYWORDS : Covid 19, chest X ray, diagnosis, treatment.

INTRODUCTION:

Covid 19 virus is a rapidly spreading infection which started in December 2019, continuously infecting humans by changing its structure through various mutations. From the beginning of covid 19 pandemic diagnostic methods are changing everyday. Inspite of microbiological methods which are not sensitive, the use of radiological methods came to focus. In covid 19 there is involvement of lung parenchyma and development of pneumonia, hence radiological investigations are important in assessing the diagnosis, treatment , and prognosis of the disease [1] .The American college of radiology advised the use of CT chest in some patients only who are hospitalised as the work burden will increase more on radiology department in addition to monitoring the strict infection control measures [2], so CXR can be usefull for most of the cases as it is widely available , can be done for patients bedside which is not possible with CT, but it has its limitations of low sensitivity and specificity. Even though HRCT is more sensitive compared to CXR in assessing the outcome, prognosis, but in resource limited settings it can not be used and has very low specificity[3] . In some centers Brixia score was used in differentiating the cases in casuality during admission to hospital [4] .Hence HRCT is more sensitive in comparision to Chest-X-Ray but Chest-X-Ray can be helpful .

Materials And Methods

This is a retrospective study done in the RTPCR positive covid 19 patients who are admitted in government general hospital Vijayawada during may 2021 to June 2021

Inclusion Criteria:

All covid 19 RTPCTR positive patients who are 18 years and above of age are included in the study

Exclusion Criteria:

RTPCR negative and age less than 18years.

All chest x rays were taken using digital radiography with posterio anterior view at the time of admission and for some individuals anterio posterior views are used. X rays were analysed by radiologists and findings were classified as consolidation, infiltrates, pleural effusion.

RESULTS:

This was a retrospective study done on 200 patients who are admitted in the hospital,and RTPCR positive .

AGE	MILD	MODERATE	SEVERE	TOTAL
<20 YEARS	11(5.5%)	08(4%)	06(3%)	25(12.5%)
21-40 YEARS	18(9%)	24(12%)	15(7.5%)	57(28.5%)
41-60 YEARS	17(8.5%)	36(18%)	23(12.5%)	76(38%)
>60 YEARS	8(4%)	14(7%)	20(10%)	42(21%)
GENDER				
MALE	32(16%)	47(23.5%)	38(19%)	117(58.5%)
FEMALE	22(11%)	35(17.5%)	26(13%)	83(42.5%)
CHEST X RAY FINDINGS				
CONSOLIDATION	02(1%)	14(7%)	70(35%)	86(43%)
INFILTRATES				
UNILATERAL	04(2%)	05(2.5%)	0	9(4.5%)
BILATERAL	6(3%)	11(5.5%)	30(15%)	47(23.5%)
PLEURAL EFFUSION	0	2(1%)	14(7%)	16(8%)
NORMAL	42(21%)	0	0	42(21%)

we are having 117 (58.5%)males, of these 16%,23.5%,19% of mild, moderate, severe stage of disease respectively and 83(41.5%)females of these 11%,17.5%,13% of mild, moderate, severe stage of disease respectively. When considering the age groups 12.5% belongs to less than 20 years age group,28.5% belong to 21-40 years of age, 38% belongs to 41-60 years of age, 21% belongs to above 60 years of age. When we consider the lung involvement based on chest x ray the following findings are observed which were done at the time of admission that include predominantly of consolidations 43%,with 1% ,7%,35% presented as mild, moderate, severe stage of disease next findings are lung infiltrates of 28% in which 4.5% of patients had unilateral lung infiltrates in which 2% had mild stage, 2.5% had moderate stage of disease , 23.5% had bilateral lung infiltrates, of these 3% mild stage,5.5% moderate stage, 15% severe stage of disease, in

which bilateral lower zone involvement was seen in most followed by mid and upper zone involvement, followed by presence of pleural effusion in 8% of individuals which is rare finding of these 1% had moderate stage of disease, 7% had severe stage of disease . In our study 21% of the patients had normal chest x ray at the time of admission and all are having mild stage of disease.

DISCUSSION:

The diagnosis of covid 19 disease is very important in the initial stages for proper treatment and for preventing the patient to enter the critical stage of disease[5].During the early periods of pandemic because of fast exhaustion of kits , radiological methods become the key for diagnosis of covid 19[6]. The emergence of CT chest in finding the covid 19 disease which is more sensitive, helps in treatment strategies and prognosis [7]. Due to repeated use of CT chest it is difficult for its sustainability, hence chest-x-ray replaced it in followup of the patients who are hospitalized in ICU[8].Borghesi et.al done a scoring system for covid pneumonia and named as Brixia score by dividing the lungs in to six zones on frontal projection in to upper ,middle, lower zones then a score from 0 to 3 to each zone based on lung lesions like score 0 to no lung abnormalities, score 1 for interstitial infiltrates, score 2 interstitial and alveolar infiltrates, the scores of both lungs were added to obtain overall chest x ray scores from 0 to 18 [9]. Wrong et al had the following x ray findings as consolidation followed by ground glass opacities , peripheral predominance , lower zone distribution ,bilateral lung involvement with very uncommon of pleural effusion [10],[11]). The study done by lomoro et al ,Jacobi et also showed the predominance of consolidations, bilateral lung involvement are unique to covid 19[12][13].Toussie et al showed the extensive involvement of lung in the initial chest-x-ray at the time of admission showed more risk of intubation and poor outcome of patients. Most of the studies showed that chest-x-ray is of less value in the diagnosis of covid compared to CT-chest , but chest x ray has a role in the pandemic [14]. Some studies used RALE score for the involvement of lungs which was used routinely for ARDS[15].Fleischner society also doesnot recommended use of chest x ray daily in the intubated stable patients[16]. In our study also the pattern of lung involvement is consolidation, infiltrates which are unilateral, bilateral and predominantly basal infiltrates, very fewer cases have pleural effusion. The limitations of this study are small sample size, outcome was not assessed, impact of comorbidities and treatment strategies in preventing lung parenchymal changes are not studied .

CONCLUSION:

Covid 19 disease which is highly infectious has to be diagnosed early based on which treatment strategies will changes and severity also varies. The radiological investigations helps better in treatment strategies in assessing prognosis, outcome in most of the patients. Even though chest x ray is of less sensitive but for followup in the hospitalised patients it is of highly advisable and recommended.

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