

# **RESEARCH ARTICLE**

# EVALUATION OF COVID-19 PNEUMONIA BY CONVENTIONAL RADIOGRAPHYAT AGMC & GBP HOSPITAL

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# Manuscript Info

Abstract

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*Key words:-*Covid-19 Pneumonia, Chest X-Ray, Ground Glass Opacity, Consolidation **Background**: After its origin in Wuhan, China, coronavirus related respiratory illness spread across the globe, being declared as a pandemic by WHO on March 13,2020. Because it is acquired via respiratory droplets, community spread is responsible for the recent global crisis. Coronavirus related respiratory illness usually manifests clinically as pneumonia with predominant imaging findings of an atypical or organizing pneumonia. Chest radiographs are usually of limited value in the diagnosis of early stage specially in mild disease course; however, the CT findings may be present early even before the onset of the symptoms. Chest radiographs is very helpful in the intermediate to advanced stages of COVID-19 with features of acute respiratory distress syndrome (ARDS) as well as the follow-up.

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**Objective:**ToevaluatetheCOVID-19pneumoniabyChestX-ray findings. ToassesstheseverityofCOVID-19pneumoniausingchest x-rayscoringsystem.

**Materials and method:** An observational longituidinal study was carried over 8 weeks at an Radiodiagnosis department of a tertiary care Hospital in North- Eastern India. Around 60 cases of COVID-19 RT-PCR positive patients evaluated by chest x-ray and different radiographic features were studied. The data were analyzed accordingly by descriptive statistics for the result.

**Result:** The study population was predominantly male (69%), with mean age of  $49.5\pm 9.5$  years. Among RTPCR positive patients 71.43% had abnormal baseline chest X-rays; among abnormal CXRs 57.5% shows groundglass opacity, 30% shows consolidation and 7.5% shows pleural effusion.

**Conclusion:**Radiographic findings are very good predictor for assessing the course of COVID-19 diseases and it could be used as long –term consequences monitoring and assessing the severity scoring.

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#### Introduction:-

Coronavirusrelatedrespiratoryillnessusuallymanifestsclinicallyas pneumonia. Coronavirusesareenveloped,positive-sense,singlestrand,non-segmented,andribonucleicacidvirusesthatbelongtothecoronaviridaefamily.Identified from the

**Corresponding Author:- Susmita Rani Ghosh** Address:- Post- Graduate Trainee Department of Radiodiagnosis, AGMC & GBP Hospital. epithelial cells of the respiratory system of infected individuals, namedas Severe AcuteRespiratorySyndromeCoronavirus 2(SARS-CoV-2) and the outbreak was named coronavirus disease (COVID-19), emerged in Wuhan, China in December

31, 2019. 1<sup>st</sup>case in India in 27<sup>th</sup>January,2020in Kerala. InJanuary2020,theWorldHealthOrganization(WHO)declaredita pandemic.[1] ChestX-rayisoneof the important,noninvasiveclinical adjunctsthatplayanessentialroleinthedetectionofsuchvisualresponseassociatedwithSARS-COV2infection.

# **Material And Method:-**

An observational longituidinal study was carried at an Radiodiagnosis department of Agartala government medical college and GBP Hospital, Agartala, a tertiary care Hospital in Tripura. The study period was approximately 8 weeks. Pneumonia patientswhotestedpositivefornovelcorona virus by RT-PCR was considered as study subjects and excluded who tested negative for novel corona virus by RT-PCR. Mean age was  $49.5 \pm 9.5$  years. Chest X-rays were performed and various findings are analysed.

#### **Statistical Analysis**

Descriptive Statistics like Mean and percentages were used for the Analysis and interpretation of the results. Andrepresents in the forms of tables and charts. Comparison of the groups was done by t tests. Statistical analysis was performed using SPSS version 21.

## **Results:-**

The study was conducted to know the evaluating role of chest X-ray in covid-19 pneumonia patients. Among the patients of viral pneumonia, attending General Medicine Outpatient department of Agartala Government Medical College, 56 met the inclusion criteria and got enrolled in our study. Most of the study subjects were male (69%) as shown in fig 1, most of the patients were in the fourth &fifthdecade(40-59years)amongRTPCR positivecases, with Mean age of 49.5+-9.5 yrs shown in table 1. Chest Xrays was done in all RTPCR positive patients, among them 71.43% had abnormal baseline chest X-rays and 28.57% had normal baseline chest Xray (fig 2);Amongtheabnormalbaseline CXRs most of the patients were in the sixthand seventh decades(60-79 years)withmeanage63.5years (fig 3, table 2). Among abnormal CXRs 57.5% shows groundglass opacity, 30% shows consolidation and 7.5% shows pleural effusion and 5% shows fibrosisandbronchiectasis (fig 4). AmongabnormalCXRs,mostof the patients showed bilateral lunginvolvement(67.5%), left lung involved in(20%) andright lung involvedin12.5% cases (fig 5). 7.5% shows upper,5% mid, 65% lower zonal, 22.5% shows non zonal distribution (fig 6). 57.5% shows peripheral, 12.5% shows periphilar and rest 30% shows neither of this area of lung distribution (fig 7).

#### CXRSeverityscore

The degreeofdiseaseseveritywasassessed usingtheseverityscoreproposedbyWarren et al [2]. A total score was calculated bysummingbothlungscores(totalseverity scores ranged from 0-8). The patients were divided into four groupsaccording to age: 20–39 years, 40–59, 60-79 yearsand $\geq$ 80years.Patients'age,sex,andthe highest CXR total severity score were correlated to the patients outcome (table 3). The total severity score wasestimatedinthebaseline CXRanditrangedfrom0–8. Mild findings with total severityscorerangingbetween0and2were found in (62.5%) patients andmoderate severity score rangingbetween 3 and 5 were found in (27.5%), while severe cases withseverity scorerangingbetween6and8were foundin(12.5%) patients ( table 4)



Figure 1:- Gender wise distribution of the subjects.

Table1:-	Distributionof	COVID19cas	esaccordingtoage.
			0 0

Age	Numberof	Percentage		
(years)	cases	(%)		
20-39	08	14.29		
40-59	26	46.42		
60-79	19	33.9.2		
80orabove	03	5.35		
Total	56	100		



Fig 2:- DistributionoffindingsofCXRs.

Agegroups	AbnormalCXRscases	Percentages(%)
20-39	01	2.5
40-59	13	32.5
60-79	23	57.5
80 orabove	03	7.5
Total	40	100

 Table 2 :- DistributionofabnormalCXRsfindingaccordingto age



Fig3:- DistributionofabnormalCXRsfindingaccordingto age.



Fig 4:- DistributionofabnormalfindingsofCXRs.



Fig 5:- Distributionaccordingtoaffectedlung.



Fig 6:- Distributionaccordingtozonal predominance.



#### Table 3:- CXR severity score.

Score	Lung
	involvement
0	Noinvolvement
1	<i>≤</i> 25%
2	25-50%
3	50-75%
4	>75%

#### Table 4:- CXR severity score.

Score	Patients	Percentages (%)
0	09	22.5
1	06	15
2	10	25
3	05	12.5
4	04	10
5	02	5
6	01	2.5
7	03	7.5

8 01 2.5



**Case1:-** CXR of a Covid -19 pneumonia patients' shows peripheral patchy ground glass opacity involving bilateral lower zonal lung fields.



Case1: CXR of a Covid -19 pneumonia patients' shows peripheral patchy ground glass opacity involving bilateral lung fields with consolidation in bilateral lower lobe.

#### **Discussion:-**

In this study, we analysed the CXRs findings and severity scores of patientsproven to have COVID-19 in different stages of disease. CXRs abnormalitieswere detected in 71.43% patientsat certain points of the disease course it alsocomparablewithotherstudies.[3] In our study, most commonly affected age group was 40-59 years with a meanage of 55.57 years and abnormalCXRs were detected age group of 60-79 ,andmalepredominance(M.F=2.29:1),which is similar to other studies.[3].

OurstudyconfirmstheAlmostmorethanhalfofthepatientswithCOVID-19had abnormal chest x-ray findings, were GGO in a peripheral distribution with lower lobe predilection being the most common finding sonchest x-ray. Although chest X-ray (CXR) is considered less sensitive for the detection of pulmonary involvement in early-stage disease, it is useful for progression monitoring therapid of lung abnormalities in COVID-19 especially in criticalpatientsadmittedtointensivecareunits. Anditstillhasaroleinmanagingthe pandemic.ChestXrayisthefirstlineinvestigationforCOVID-19pneumonia. In COVID-19 Pneumonia conventional radiographymay be helpful as an aiding tool in the diagnosis and follow up and as well prognosis of the disease.

#### **Financial Support and Sponsorship:**

Nil.

#### **Conflicts of Interest:**

There are no conflicts of interest.

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