A Descriptive Study of HRCT Findings In Adult Female Patients with Covid 19 Infection

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Abstract :

ON NOVEMBER 2019, a new Corona virus pneumonia had just taken roots. It happened as a result of inter species transmission COVID-19 from a mammalian species, likely a bat, to humans. This virus was first found in clusters in Wuhan, China after which it spread all over the world at a very fast pace having worldwide humanitarian and economic repercussions. HRCT has become the mainstay of radiological investigations in this pandemic and often showed diagnostic accuracy before the onset of clinical manifestations. Few studies have tried to establish a correlation between the outcome of COVID 19 and gender. Studies found that the severity of the illness was more in male and clearance of SARS-CoV-2 virus was more in females.[1] Hence it is of utmost importance to study the pattern of lung involvement on HRCT in female patients to aid the researchers and clinicians in further understanding of the etiopathogenesis. Thus this study was conducted to look for specific and also unusual patterns of radiological findings of COVID-19 pneumonia in females if any.

Keywords: COVID 19, FEMALE, HRCT

Introduction

Coronaviruses are important human and animal pathogens. In the last quarter of 2019, a novel Coronavirus (SARS-CoV-2 aka COVID-19) was causing a widespread pneumonia infection in Wuhan, a suburban city in the People's Republic of China. It showed a tendency to spread at an insurmountable speed. This resulted in an epidemic in the country. Soon an increasing number of cases started to arise in other countries in the world. In February 2020, the World Health Organization gives name to this disease COVID-19, which stands for Corona Virus Disease 2019. The virus that causes COVID-19 was names as severe acute respiratory syndrome coronavirus 2. [2,3]

High-resolution chest/thorax computed tomography (HRCT) is a valuable tool in detecting and assessing COVID-19 infected patients in early stages where the symptoms are not specific for COVID-19. In some cases the patients can be asymptomatic and still have HRCT changes. In suspects, Chest CT and HRCT are essential for diagnosis and re-evaluation. HRCT can be used to confirm the diagnosis, plan the treatment protocol, and change the protocol if necessary and aid in prediction of the prognosis.[4]

Bilateral presence of Ground Glass Opacities (GGO) in HRCT with or without consolidation in posterior and lateral lung fields is the major imaging feature of COVID-19.[5,6]

In lung, ground glass opacities are defined as increased densities of hazy areas, not obscuring the normal bronchovascular architecture, which may be caused by replacement of the air by mucus, blood, debris or interstitial thickening.[7,8]

However, analysis of cases in succession provided a wide array of features on HRCT, including Reverse halo sign, reticular changes, Crazy paving pattern, lymphadenopathy, etc. ,which might help to delineate mechanisms of parenchymal/ stromal lung changes in COVID-19.[9-11]

CT severity score was assessed for each patient based on the percentage of the lobe involved.[12]

Severity score

Another method is by scoring the percentages of each of the five lobes that is involved:

1. < 5% involvement
2. 5%-25% involvement
3. 26%-49% involvement
4. 50%-75% involvement
5. > 75% involvement.

The total CT score is the sum of the individual lobar scores and can range from 0 (no involvement) to 25 (maximum involvement), when all the five lobes show more than 75% involvement.

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The purpose of the study is to describe various HRCT patterns specifically in females with COVID 19 infections if any.

Methodology:

Study Duration – 6 Months

Sample Size - 42 (Pilot study)

Study Population- All RTPCR Positive patients referred to Tertiary Care Centre for HRCT Thorax

Scanning Protocol - Standard HRCT Protocol is followed for scanning

Scanning Machine - GE 8 SLICE Machine

Objective:

To study the various HRCT imaging findings specifically in Female with Covid 19 Infection

Inclusion Criteria

1.Female Patients willing to participate in the study.

2.RTPCR positive COVID-19 patient.

3.Patients of any age

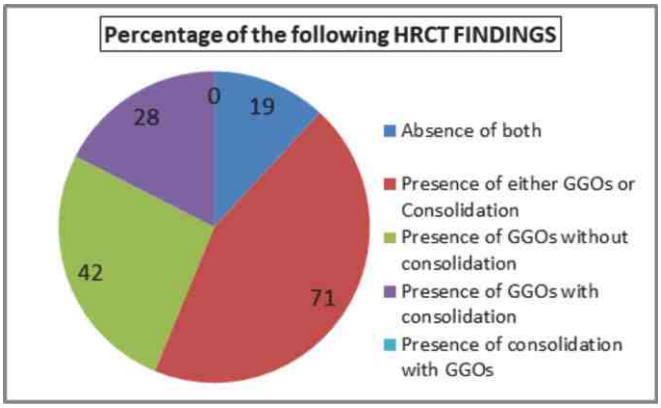
Exclusion criteria

1.Pregnant female

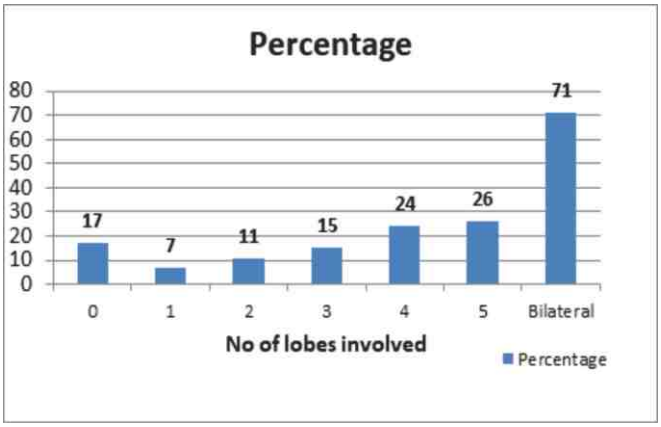
Observation & Results

PARAMETER	ALL PATIENTS(42)
AGE	
MEAN	43
RANGE	18-73
S.D.	16
SYMPTOMS	
FEVER	35
COUGH	26
SPUTUM PRODUCTION	8

FINDINGS	No. of Patients (n=42)
GGOs AND CONSOLIDATION :	
Absence of both	8 (19)
Presence of either GGOs or Consolidation	30(71)
Presence of GGOs without consolidation	18(42)
Presence of GGOs with consolidation	12(28)
Presence of consolidation without GGOs	0(0)



NO. OF LOBES AFFECTED :	No. of Patients (n=42)
0	7(17)
1	3(7)
2	5(11)
3	6(15)
4	10 (24)
5	11(26)
BILATERAL LUNG DISEASE	30(71)



FREQUENCY OF LOBE INVOLVEMENT	No. of Patients (n=42)
Right upper lobe	12(28)
Right middle lobe	15(35)
Right lower lobe	30(71)
Left upper lobe	17(40)
Left lower lobe	25(60)

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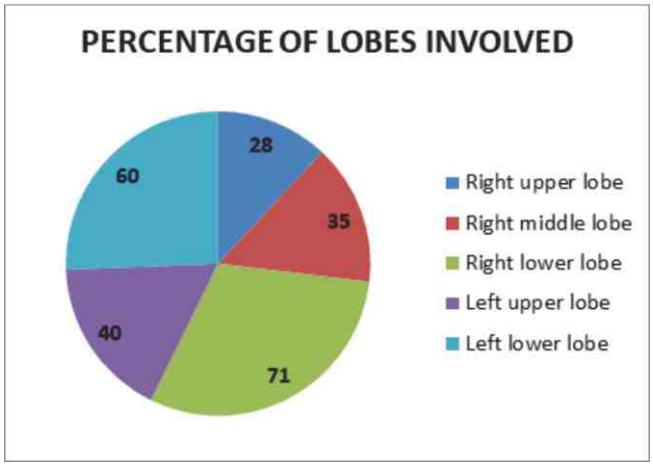
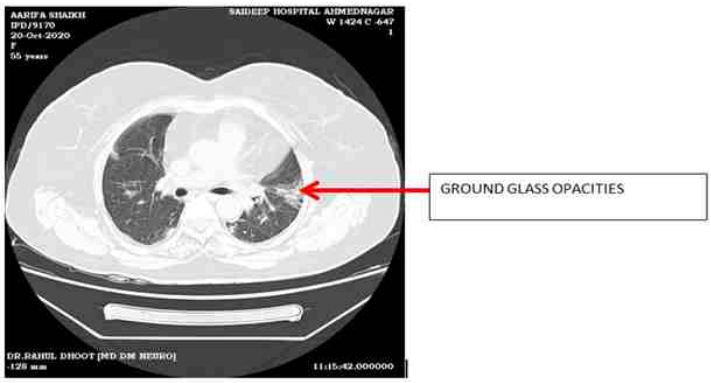
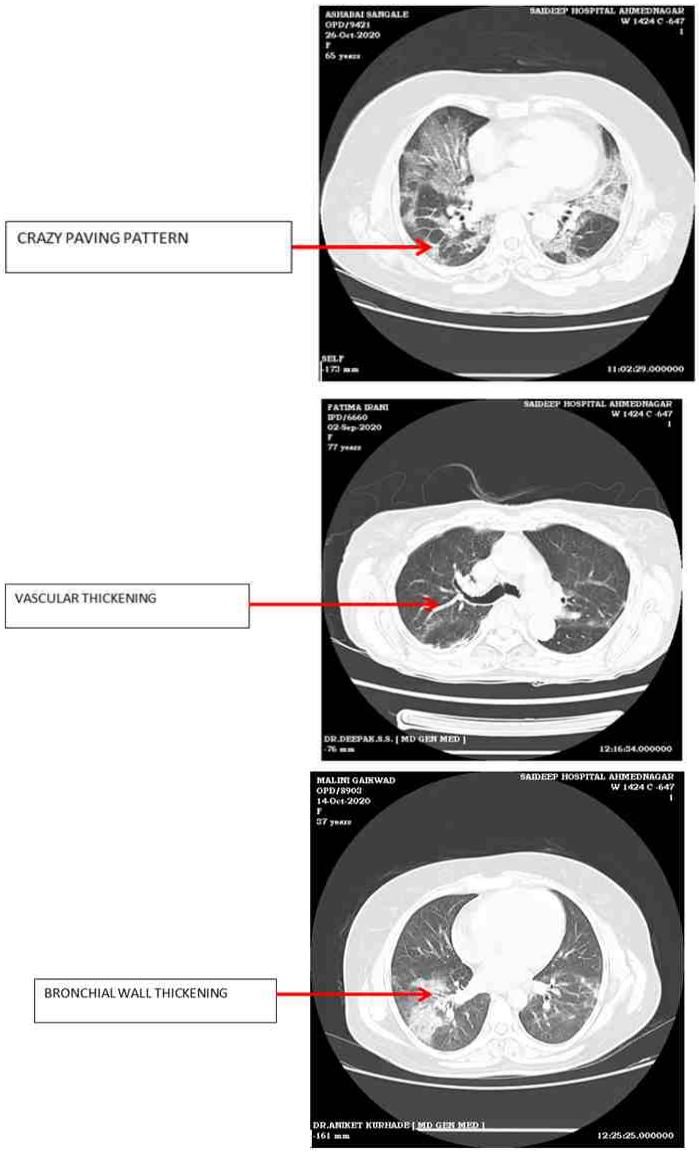


TOTAL LUNG SEVERITY SCORE	No. of Patients (n=42)
Mean	5
Range	0-20
Standard deviation	3

OTHER FINDINGS	
FINDINGS	No. of Patients (n=42)
LUNG CAVITATION	0(0)
CARZY PAVING PATTERN	5(12)
REVERSE HALO SIGN	1(2.4)
PREIPHERAL DISTRIBUTION	30(70)
BRONCHIAL WALL THICKENING	3(7)
BRONCHIETESIS	2(2.6)
PLUERAL EFFUSION	1(2.6)
LYMPHADENOPATHY	2(5)





Discussion

There were 42 Female studied with mean age 43 years (age range 18 – 73) years with standard deviation 16 years).

Of the 42 patients, 8 (19%) had no ground-glass opacities and no consolidation on chest CT (Table 2). Of the 30 patients with ground-glass opacities, consolidation, or both, 18 (42%) had only ground-glass opacities (with no consolidation), and consolidation in the absence of ground-glass opacities were found in none. Three patients (7%) had opacities in one lobe, 5 patients (11%) had two affected lobes, 6 patients (15%) had three affected lobes, 10 patients (24%) had four affected lobes, and 11 patients (26%) had disease affecting all five lobes.

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The right upper lobe was involved in 12 of 28 patients (44%), the right middle lobe was involved in 15 patients (35%), the right lower lobe was involved in 30 patients (71%), the left upper lobe was involved in 17 patients (40%), and the left lower lobe was involved in 25 patients (60%). 30 of 42 patients (71%) had bilateral lung disease .7(17%) patients had exclusively unilateral lung involvement, including 5 patients that had only right lung involvement and 2 patients that had only left lung involvement. The mean total lung severity score for the 42 patients was 5 (range 0 - 20 with standard deviation 3). Thoracic lymphadenopathy was found in 2 patients. Only 1 patient (2.6%) had a pleural effusion (minimal left pleural effusion).

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