ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 1, 2024

Original Research Article

CORRELATION OF CHEST CT SCAN AND RT-PCR REPORT IN COVID 19

Dr. Shainu Baby[1], Dr. Pallavi Nidode[2], Dr. Santosh Hugar[3]

[1]Register, Department of Emergency Medicine, KIMS-SUNSHINE Hospital Secundrabad, Hyderabad, India.
[2]Assistant Professor, Department of Emergency Medicine, ESIC Medical College Kalaburgi. Karnataka, India.
[3]Senior Resident, Department of Emergency Medicine, ESIC Medical College Kalaburgi. Karnataka, India.

Corresponding Author
Dr. Pallavi Nidode, Assistant Professor, Department of Emergency Medicine, ESIC Medical College Kalaburgi. Karnataka, India.

Received: 27-11-2023 / Revised: 06-12-2023 / Accepted: 28-12-2023

ABSTRACT

Background
SARS-CoV-2, which causes COVID 19, is a coronavirus that causes severe acute respiratory syndrome. In Wuhan, China, the first-ever continuing pandemic was discovered in December 2019. The first confirmed COVID-19 case in India came from China and was reported on January 30, 2020. **[1]**. Correlation between the RT-PCR test and chest CT scan in Covid 19.

Methods
Sunshine Hospital in Secunderabad, the study region. investigation of prospective correlation. 200 participants, June 2020 to December 2020.

Results
Of 200 patients, 151 had positive RT PCR results and 49 had negative results. Out of the 49 negative reports, 42 cases—including those who were asymptomatic, close contacts of covid patients, and those with symptoms—had Ct chest results that were positive. Males predominated, and 105 males and 46 females who are positive. The most frequent symptom among CORADS 5 patients was shortness of breath, and the most prevalent symptoms overall were colds and coughs.

Conclusion
There are many reasons why an RT-PCR test could result in a false negative. Chest computed tomography offers a high sensitivity for the diagnosis of COVID-19, according to studies. Even if the RT PCR is negative, a patient with a history of contacts and a high clinical suspicion of COVID-19 infection should not be released from isolation without a CT scan.

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 1, 2024

Keywords: Covid 19, RT-PCR,Chest ct.

INTRODUCTION

In Wuhan City, Hubei Province, China, a cluster of cases of unexplained pneumonia have been reported since December 2019**[2]**. These cases share clinical signs that point to viral pneumonia. The International Virus Classification Commission identified a novel coronavirus from samples of the lower respiratory tract and termed it Severe Acute Respiratory Syndrome Coronavirus2 (SARS-CoV-2).[3] Since the initial observation, the SARS-CoV-2 infection outbreak has developed into a global healthcare emergency and has most recently met the epidemiological requirements for the World Health Organization to designate it a pandemic**.[4]**On February 11, 2020, WHO designated the illness it SARS-CoV2 is a typical RNS virus that is a member of coronaviridae family. It typically has a round or oval form with a diameter 60 and 140nm. SARS-CoV2 belongs to family coronaviridae, which is a typical RNA virus. It is generally round or oval shaped the study found that the SARS-CoV-2 homology with the bat coronavirus, which suggests a zoonotic origin for this outbreak. SARS-CoV-2 can spread from person-toperson.**[5]**The common clinical symptoms of patients with COVID-19 are fever, cough, dyspnea and fatigue, which are similar to those of severe acute respiratory syndrome coronavirus (SARS-CoV) and (MERS-CoV). Severe cases can lead to acute respiratory distress syndrome, or even death. According to the severity of the patient's condition, the treatment is different. Mild cases get antiviral, symptomatic support and oxygen therapy. and critical cases to be admitted to intensive care unit. The novel coronavirus disease 2019 (covid-19) presents an important and urgent threat to global health.[**6]**The World Health Organization (WHO) was informed of 44 cases of pneumonia of unknown microbial aetiology. The WHO announced that a novel coronavirus had been detected in samples taken from these patients. Laboratory tests ruled out severe acute respiratory syndrome coronavirus (SARS-CoV), Middle East respiratory syndrome (MERS)-CoV, influenza, avian influenza, and other common respiratory pathogens. Since then, the outbreak has escalated rapidly, with the WHO declaring a public health emergency of international concern on 30 January 2020 In just 30 days, the disease quickly expanded from a single city to the entire nation.The number of illnesses and fatalities has surpassed that of the severe acute respiratory syndrome outbreak in 2002–2003. A previously unidentified betacoronavirus known as SARS-CoV-2 was found in bronchoalveolar lavage samples obtained from groups of patients who presented with pneumonia of uncertain origin in Wuhan City, Hubei Province, China, in December 2019.**[7]** The seventh coronavirus to infect humans is SARS-CoV-2, which is a member of the Coronaviridae family's Sarbecovirus subgenus.**[8]**

OBJECTIVE

1. To correlate the CT chest findings with RT-PCR test.
2. To initiate early treatment

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 1, 2024

MATERIALS &METHODS

Patients presenting to ER with fever, cough, SOB, myalgia symptoms are isolated. CT chest screening to be conducted for every ER case. RT-PCR test to be conducted. Correlation between both the CT reports and RT-PCR test reports.
CORADS (Covid 19 Reporting And Data System) SCORING.

CO-RADS*
Level of suspicion COVID-19 infection

		CT findings
CO-RADS 1	No	normal or non-infectious abnormalities
CO-RADS 2	Low	abnormalities consistent with infections other than COVID-19
CO-RADS 3	Indeterminate	unclear whether COVID-19 is present
CO-RADS 4	High	abnormalities suspicious for COVID-19
CO-RADS 5	Very high	typical COVID-19
CO-RADS 6	PCR +	

The severity and stage of the disease are determined with comments on comorbidity and a differential diagnosis, and the level of suspicion of COVID-19 infection is graded from very low (CO-RADS 1) to very high (CO-RADS 5). In individuals who have had symptoms for four or more days, CORADS-1 has a significant negative predictive value. Considering the high a priori-chance of this outbreak, CORADS 5 has a very strong positive predictive value. CORADS 2-4 still exhibits considerable interobserver variability and has subpar negative and predictive values. The clinical symptoms and length of the symptoms must be paired with the interpretation of the CT findings because a CT can be negative in the first few days of mild infection. In our study, we have only considered CORADS 1-5 for statistical purposes. Molecular Testing Sample taken from upper and lower respiratory tract subjected to nucleic acid amplification test.

Sample size; 200 Patients.

Study area

Sunshine hospital secundrabad. Conducted from January 2020 to December 2020.

Inclusion criteria

1)Age more than 18 years.
2) Symptomatic cases.
3) Asymptomatic cases.

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 1, 2024

Exclusion criteria

1)Patients not willing for the study.

2)Age less than 18 years.

3)Pregnant women.

Ethical committee clearance has been taken from the institute ethical committee panel.

RESULTS

CORADS score	Frequency	Percentage
1	31	15.6
2	1	.5
3	3	1.5
4	11	5.5
5	153	76.9
Total	199	100.0

Table 1: corads scoring

CO-RADS – Covid 19 Reporting and Data System, even though we have a scoring of 1-6, I have taken 1-5 as standard for my study for statistical purpose. This table suggests up to 76% patients had a CORADS 5 score.

CTSS	Frequency	Percentage
Mild	121	60.8
Moderate	55	27.6
Severe	23	11.6
Total	199	100.0

Table 2: severity of the disease

According to the analysis, we had 60% mild cases and upto 11% severe cases. All the severe cases were admitted to the Intensive care units.

RTPCR	Frequency	Percentage
Negative	49	24.6
Positive	150	75.4
Total	199	100.0

Table 3: RT PCR results

RT-PCR was one another major component, with 75% patients with a positive RT-PCR report.

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 1, 2024

CoRads	RTPCR		P VALUE
	Negative	Positive	
1	4	27	0.222
	12.9%	87.1%	
2	1	0	
	100.0%	0.0%	
3	1	2	
	33.3%	66.7%	
4	3	8	
	27.3%	72.7%	
5	40	113	
	26.1%	73.9%	
Total	49	150	
	24.6%	75.4%	

Table 4 correlation of CORADS score and RT PCR

CTSS	CoRads					P VALUE
	1	2	3	4	5	
Mild	28	1	3	9	80	.006
	23.1%	.8%	2.5%	7.4%	66.1%	
Moderate	3	0	0	2	50	
	5.5%	0.0%	0.0%	3.6%	90.9%	
	0.0%	0.0%	0.0%	0.0%	100.0%	
Total	31	1	3	11	153	
	15.6%	.5%	1.5%	5.5%	76.9%	

Table 5 CORADS score with severity of disease

Here we did a compassion of the CoRads score with the severity of the disease, results showed none of the cases with severe disease showed corads score of >5. This comparison has a p value of 0.006 and is a significant value.

DISCUSSION

Males were more effected than females, with a ratio of 7:3. Hence the total number of asymptomatic patients were 12.6% i.e., 25 in 200 patients. Majority of the symptomatic patients had fever and lower respiratory tract infection as their main symptom. The patients with moderate and severe disease symptom was breathlessness. CO-RADS – Covid 19 Reporting and Data System, even though we have a scoring of 1-6, I have taken 1-5 as standard for my study for statistical purpose. This table suggests up to 76% patients had a CORADS 5 score. According to the analysis, we had 60% mild cases and upto 11% severe cases. All the severe cases were admitted to the Intensive care units. RT-PCR was one another major

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 1, 2024

component, with 75%patientswithapositiveRT-PCRreport.FewofthesenegativeRT-PCRreport patients also landed up in ICUs. Here we did a comparison of the severity and RT-PCR reports, with majority of the tests positive in all the 3 severity groups, with a p value of 0.006. This is the comparison of CORADS score and RT-PCR reports, here we have majority of positive cases with a CORADS score 5 and also a negative RT-PCR with CORADS 5 was 25%, with a p value of 0.2. Here we did a compassion of the CoRads score with the severity of the disease, results showed none of the cases with severe disease showed corads score of >5. This comparison has a p value of 0.006 and is a significant value. Here we clubbed CoRads 1 and 2 as unlikely to be covid and, CoRads 3,4,5 as likely covid and compared with RT-PCR reports, which showed a group 1 of 84% positive and negative of 16% . likewise, group 2 showed 74% positive and 26% negative, a whole of 75% positive and 25% negative. P value is 0.1

The RT-PCR test may produce false-negative results; the test's sensitivity ranges between 50 and 83%, according to studies comparing the diagnostic efficacy of RT-PCR testing with CT findings in COVID-19 disease. Furthermore, according to certain research, CT results are more sensitive than RT-PCR results. According to a research by Xie et al. involving 167 patients, all 5 of the patients who initially presented with positive CT and negative RT-PCR were either in close contact with COVID-19 patients or had COVID-19 patients in their family. These patients had positive times in the repeated RT-PCR tests that ranged from 2 to 8 days.

In a research by Ai et al**[9]**., 1014 individuals underwent examination, and 308 of them had CT abnormalities while having negative RT-PCR results. In the lung CT of these 308 individuals, ground glass opacities and consolidations were shown to be bilateral lung lesions. The mean time between the initial negative to positive RT-PCR results is reported as 4–8 days for patients who had a follow-up RT-PCR test. The sensitivity, specificity, and accuracy of chest CT in this investigation were determined to be 97%, 25%, and 68%, respectively, when RT-PCR data were used as the reference standard.

A extremely contagious illness called COVID-19 has been sweeping the globe. A key component of disease management is early diagnosis. However, a challenge and dramatic spread of the disease were brought on by insufficient laboratory supplies.

As a result, radiography, including X-rays and CT scans, the main diagnostic technique used during the COVID-19 outbreak.

As it evaluates the scope and severity of the disease, a chest CT scan may be a crucial addition to the diagnosis of some diseases. The proper move to undertake is to implement scoring systems in our radiology departments. The great accuracy of abnormality assessment offered by CT-SS is its key advantage. According to the CT-SS, the degree of lung opacification serves as a proxy for the COVID-19 load.[8,10]

This study demonstrates that the CT-SS influences decision-making.The

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 1, 2024

study included 152 individuals in total who were RT-PCR Positive and older than 18. To test CT-SS and gauge the degree of pulmonary involvement, CT chest was used.

It demonstrated that despite pre-existing co-morbidities, patients with scores of less than 8 recover effectively.

A score that fell between the two categories indicated that the disease was progressing moderately.

CT-SS A bad prognosis, which was also observed in this study, is indicated by more than 15 patients having co-morbid conditions including Diabetes, Hypertension, CVA, etc.

The outlook is better the lower the score.[10]

CONCLUSION

Several factors can cause an RT-PCR test to result in a false negative result. Chest CT offers a great sensitivity for the diagnosis of COVID-19, A patient with high clinical suspicion of COVID-19 infection with a history ofcontact should not be removed from isolation without a CTscan, even if RT-PCR tests are negative. If patients with negativeRT-PCRtests but positive CTfindings are discharge.

CONFLICT OF INTEREST; NIL

FUNDING; NIL

REFERENCES

1. "Coronavirus disease 2019 (COVID-19) Symptoms and causes". Mayo Clinic. Retrieved 14 April 2020
2. "WHO Director-General's opening remarks at the media briefing on COVID-19". World Health Organization(WHO) (Press release). 11 March 2020.
3. Daily COVID-19 bulletin. "PIB India (@PIB_India) on Twitter". Twitter. Retrieved 3 June 2020(3)
4. "Infections over 1 lakh, five cities with half the cases:India'scoronavirusstorysofar".TheWeek.Retrieved20May2020.(4)
5. Shivani Kumar (10 June 2020). "Covid-19: Number of recoveries exceed active cases for first time". Hindustan Times. New Delhi. Retrieved11 June 2020.(5)
6. "Q&A on coronaviruses (COVID-19)". World Health Organization. 17 April 2020. Archived from the original on 14 May 2020. Retrieved 14 May 2020(6)
7. Hopkins C. "Loss of sense of smell as marker of COVID-19 infection". Ear,NoseandThroatsurgerybodyofUnitedKingdom.Retrieved28March2020.(7)
8. YeQ, WangB, MaoJ (June 2020). "The pathogenesis and treatment of the 'Cytokine Storm' in COVID-19.
9. AiT,YangZ,HouH,etal..Correlation of chest CT and RT-PCR testing in coronavirus disease 2019 (COVID-19)in China: a report of 1014 cases. Radiology 2020; 296:E32-E40.

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 1, 2024

10. Sarkodie BD, Mensah YB. CT scan chest findings in symptomatic COVID-19 patients: a reliable alternative for diagnosis. Ghana Med J. 2020 Dec;54(4 Suppl):97-99. doi: 10.4314.