CT chest - A rapid screening tool in COVID-19 pandemic

Sir,

The COVID-19 pandemic has affected a significant proportion of the population worldwide. Symptoms and signs of chest infections are commonly reported; however, RT PCR is the primary diagnostic modality. In this context, we wish to report on some results from an advanced tertiary imaging centre in south India on the use of CT imaging of the chest in COVID suspected patients. From March 2020 to August 2020, Screening CT Chest was done for all patients undergoing elective surgeries, who were asymptomatic for Viral infection, people exposed to COVID positive patients before one week and all patients who had mild symptoms like cough, body ache, anosmia, loss of taste, mild fever (<100°F), who didn’t require admission. All these patients underwent HRCT and noncontract Spiral CT in the same sitting and the findings of Ground glass opacities, Septal thickening, crazy paving pattern and patchy consolidations or mixed patterns\(^1\) were considered positive by CORADS.\(^2\) The study included all CT screen positive patients who underwent RTPCR for COVID and the results were analysed. Chest CT images were evaluated by two radiologists on both mediastinal (width 350 HU, level 40 HU) and lung (width 1500 HU, level -500 HU) window settings defining the pulmonary lesions according to their location, density, shape, and margin.

Six hundred and seventy-four (17.01%) out of the total 2940 cases with positive CT were asymptomatic, from March 2020 to August 2020 [Table 1]. This included 513 cases with mild CT changes and 161 cases with moderate CT changes. Three hundred and eighty (56.38%) of the 674 asymptomatic cases did not undergo RT PCR. Only 152 (51.7%) of the remaining 294 asymptomatic CT positive cases had a RT PCR positive test result after CT chest positivity [Table 2]. Patients who had CT Positive findings but initial RT PCR negative were followed up with repeat RT-PCR testing (with time interval >4 days for two consecutive assays), the mean interval between initial negative to positive RT-PCR results was 5.1 days ±1, with a range of 4-7 days and a median of 4 days, which was picked up in 73 patients [Table 3].

According to current diagnostic criteria, viral nucleic acid tests by means of RT-PCR assay play a vital role in determining hospitalization and isolation for individual patients. However, its lack of sensitivity, insufficient stability, and relatively long processing time were detrimental to the control of the disease epidemic. Considering the rapidly spreading epidemic of COVID-19, the priority was to identify any CT case suspicious for COVID-19. CT features of viral pneumonia should be regarded as strongly suspicious for COVID-19 pneumonia, despite negative RT-PCR test results. The review of the cohort has highlighted typical CT findings that may assist in the early detection of cases and help isolate, treat & prevent complications. Chest CT has high sensitivity for the diagnosis of COVID-19. Our data and analysis suggest that chest CT should be considered for COVID-19 screening, comprehensive evaluation, isolate these subsets, so we could prevent the spread of the disease in the community and follow-up, especially in epidemic areas with high pretest probability for disease.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

Bavaharan Rajalingam
Magnum Imaging and Diagnostics, Trichy, Tamil Nadu, India.
E-mail: bavaharan@gmail.com

References

---

Table 1: Asymptomatic cases patients with identifiable lung involvement in HRCT (n = 2940)

<table>
<thead>
<tr>
<th>Patient status</th>
<th>CT Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asymptomatic</td>
<td>674 (22.9%)</td>
</tr>
<tr>
<td>Symptomatic</td>
<td>2266 (77.1%)</td>
</tr>
</tbody>
</table>

Table 2: CT Positive Asymptomatic cases (n=674)

<table>
<thead>
<tr>
<th>RTPCR Positive</th>
<th>152 (22.5%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT PCR Negative</td>
<td>142 (21.06%)</td>
</tr>
<tr>
<td>Patients who refused RTPCR</td>
<td>380 (56.38%)</td>
</tr>
</tbody>
</table>

Table 3: Repeat RTPCR in CT Positive Asymptomatic cases (n=142), with time interval >4 days for two consecutive assays, the mean interval between initial negative to positive RT-PCR results was 5.1 days ±1, with a range of 4-7 days and a median of 4 days

<table>
<thead>
<tr>
<th>Repeat RTPCR Positive</th>
<th>73 (51.5%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repeat RTPCR Negative</td>
<td>69 (48.5%)</td>
</tr>
</tbody>
</table>
Challenges for extending radiology services during COVID-19 pandemic

All of us in various medical posts be it clinical or administrative have never really encountered such a situation in our entire lifetime. World was awakened by an unknown highly infectious virus “CORONAVIRUS” (COVID-19/SARS-CoV-2). Yes, it was a PANDEMIC which we were looking at. Thus realised that it would be a humongous challenge providing radiological services especially since the important factors like number of patients, symptomatology and severity of disease were unknown.

It originated from Wuhan in China and India started getting international passengers with a looming arrival of pandemic. Initially we got concerned to hear about the initial cases in India. It was unreal to watch doctors and paramedics treating patients in PPE on television/social media. But when we started hearing about the first case in Mumbai and finally the first case in our hospital, that we started getting the feeling that it’s really close now and knocking on our doors, April first week. Situation changed drastically in April when patients started pouring in like a deluge of the Mumbai monsoon.

LTMG Hospital is one of the few tertiary care providers in Mumbai having 1900 beds and we had to gear up for the upcoming challenge. As always in any crisis, this time also all branches and faculties along with all paramedics under the guidance of all HODs, Dean, Director and Hon. Municipal commissioners started working for it. Every step was learning step for all the faculties.

Infection Control

Being a non-designated Covid hospital like all other branches we also had to cater to both Covid and non-Covid patients. So, the mammoth task was to avoid mixing of all these patients and not to become an epicentre of disease spread. Initially only Chest X-ray was the imaging modality which was useful in management of disease. So, to avoid transport of Covid patients to X-ray department and mixing with non-Covid patients, we decided to provide compulsory portable X-ray services for all Covid positive patients.

Various guidelines, data and literature about Covid and radiology were available on internet which was changing rapidly. Available treatment guidelines were also evolving. So, apart from bedside X-ray, HRCT chest and CT pulmonary angiography was recommended. Here also we had to avoid mixing of Covid patients with non-Covid patients. We planned to do CT scans of all Covid patients at a fixed time interval initially every alternate day and then every day. We decided to do this in evening hours to avoid all OPD timings and crowd. Non-Covid patient or their relatives were not allowed to wait in premises or waiting area of CT scan during this time.

Equipment

Being in a large public hospital and as regards to radiology services the challenges doubled in terms of machinery. As the cases started increasing and more wards started getting converted to Covid wards, the challenge was to provide portable X-ray machines followed by a prompt digital images or radiograph. In April only ground floor was having dedicated Covid wards so we provided one portable X-ray machine for it.

But the number of patients kept increasing and thus the number of Covid wards and floors having Covid wards kept increasing. But we handled second challenge also by providing separate portable X-ray machines for every floor of hospital. Providing this was not a major problem because being a large hospital we had the machinery and number of

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.