

Imaging Manifestations of COVID-19 vs. MERS/SARS



Coronavirus disease (COVID-19) has now affected millions of people and caused over 250,000 deaths globally. Since the first outbreak in China in November 2019, anecdotal reports have persisted that this airborne infection affects the airways and compromises breathing. In almost every patient infected with coronavirus, lung symptoms of varying intensity have been reported. However, similar symptoms have been reported in several other lung infections like the severe acute respiratory syndrome (SARS) and middle east respiratory syndrome (MERS).

In this study, researchers set out to determine the types of lung lesions seen in COVID-19 patients and how similar or different they were to SARS and MERS. The goal was to determine if there were any specific lung lesions on imaging that may help predict the presence of COVID-19 much earlier. The study looked at imaging features in Chinese patients who acquired COVID -19.

The researchers noted that in patients with acute infection with SARS and MERS, many imaging features overlapped but there are some differences. In close to 80% of patients with SARS, the initial chest x-ray is abnormal. The initial x-ray often shows unilateral disease with the peripheral distribution of ill defined opacities in the lower lung zones. Multifocal disease was only seen in less than 10% of patients. Follow-up imaging revealed the involvement of both lungs with multifocal consolidation over 6-12 days. Those who continued to show the persistence of air space disease also had a worse prognosis.

A similar imaging scenario was seen in patients with MERS, where 83% of patients had an abnormal chest x-ray with the involvement of lower lung zones. As the disease progressed, the peripheral and upper lobes were involved. However, hilar lymphadenopathy was not common in imaging studies done in patients with MERS. MERS patients who developed pneumothorax, pleural effusion, and had greater involvement of the lungs had a worse prognosis.

In patients with COVID-19 who present with symptoms like cough, shortness of breath, and fever, a chest x-ray is usually the first imaging study. The initial chest x-ray will usually show patchy or diffuse airspace opacities similar to other coronavirus pneumonia. In addition, the CT scan in these patients will usually show bilateral lung involvement. But ICU patients showed a consolidative pattern whereas non-ICU patients showed a ground-glass pattern on the CT scan. Older COVID-19 individuals tend to have more lung involvement on imaging studies.

Overall the imaging features of COVID-19 patients were similar to those seen in patients with MERS and SARS. However, COVID-19 patients have bilateral lung involvement on initial presentation, whereas chest imaging abnormalities in SARS and MERS were more frequently unilateral. Cavitation, pleural effusions, pulmonary nodules, and lymphadenopathy were not reported in COVID patients on imaging studies. However, isolated pneumothorax was reported in one COVID 19 patient but it was not known if this was iatrogenic or caused by the coronavirus.

With long-term follow up, patients with SARS, MERS, and COVID-19 all go on to develop lung fibrosis which is depicted in imaging studies.

Source: [American Journal of Roentgenology](#)

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