Understanding COVID-19 Chest Radiograph Findings for Triage and Emergency Assessment

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Background

Although CT scan has been widely adopted in the evaluation and management of patients with COVID-19, the American College of Radiology (ACR) raises safety concerns regarding the rates of cross-contamination between patients and radiation hazards. As such, there is a need to explore the role of alternative imaging modalities such as Chest X-Ray (CXR) to mitigate these risks and promote patient safety. This review provides a meta-analysis on imaging findings in COVID-19 patients in order to equip healthcare professionals with understanding of the disease presentation on CXR so that we can better harness its utility as a faster, safer, cheaper imaging tool.

Methods/Materials

Twelve studies (N= 1948) met the inclusion criteria which consisted of: (1) published in English; (2) original study; (3) sample size ≥ 5 patients; (4) reporting clinical characteristics of COVID-19 patients and CXR imaging features; (5) reporting number of patients with each corresponding imaging feature. To perform the meta-analysis, a random-effects model calculated the pooled prevalence and 95% confidence intervals of abnormal CXR imaging findings.

Results

Seventy-four percent (74%) (95% CI: 51–92%) of patients with COVID-19 had an abnormal CXR at the initial time of diagnosis or sometime during the disease course. The most common abnormalities are consolidation (28%, 95% CI: 8–54%) and ground-glass opacities (29%, 95% CI: 10–53%). The distribution is most frequently bilateral (43%, 95% CI: 27–60%), peripheral (51%, 95% CI: 36–66%), and basal zone (56%, 95% CI: 37–74%) predominant. In contrast to parenchymal abnormalities, pneumothorax (1%, 95% CI: 0–3%) and pleural effusions (6%, 95% CI: 1–16%) are rare.

Conclusion

- These results provide information that enhances the utility of CXR in the evaluation and management of patients diagnosed with COVID-19. CXR may be used to triage patients, guide admission criteria, and follow response to treatments.
- This is especially important in the fast-paced, high-stakes and resource-limited setup of the pandemic that the healthcare systems have imposed on healthcare systems where there is a need for evidence-based alternatives such as CXR to provide safe, efficient and high-quality patient care.