Early experiences of COVID-19 infected, middle-aged patients

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Summary
This case report describes our early radiological experiences of middle-aged patients with COVID-19 at Westmead Hospital, Sydney. We found limited relationship between initial CT imaging appearances and progression to severe disease. The most effective use of imaging in COVID-19 is yet to be determined.

Key words: COVID-19; chest CT; middle-aged patients.

The number of COVID-19 infections in Australia continues to rise. We share our early clinical and radiology experience with COVID-19 at Westmead Hospital, Sydney.

Initial data from China indicate that a younger population has a low mortality risk (0.2%) and the older population has a high mortality risk (14.8% >80 years) from COVID-19.1 The mortality rate in the middle-aged population (40–59 years) is relatively low (0.4–1.3%). However, the incidence is greatest in this age group (41.6% of all confirmed cases).1 Current information on the risk factors that affect the clinical outcome is limited. We present four cases of COVID-19 patients in this middle-age bracket with their initial computed tomography (CT) imaging and clinical course. Ethics approval was obtained.

Table 1. Summary of patient details

| Case | Age and gender | Comorbidities | Length of hospital admission (days) | Complications | Outcome |
|------|----------------|---------------|-------------------------------------|---------------|---------|
| Patient 1 | 43 M | Hypercholesterolaemia, Fatty liver disease | 17 | Nil | Recovered |
| Patient 2 | 51 F | Hypertension | 13 | Nil | Recovered |
| Patient 3 | 54 M | Nil | 6 | Nil | Recovered |
| Patient 4 | 55 F | Type 2 diabetes, asthma and obstructive sleep apnoea | 108 | Multiorgan failure including acute renal and hepatic impairment, cardiac arrest, and sepsis with multiple organisms | Recovered |

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Between 24 January 2020 and 22 March 2020, 21 patients were admitted to Westmead Hospital with confirmed COVID-19 on RT-PCR. Eight patients were aged between 40 and 59. Four of these patients underwent CT chest imaging due to deteriorating clinical conditions.

All patients were returning travellers presenting with fever at 4–8 days after onset of symptoms. Three patients presented with coughing. One patient had no respiratory symptoms. Their pre-existing comorbidities were varied (Table 1).

Computed tomography chest studies were performed 7–11 days from the onset of symptoms. All CT studies

Fig. 1. Patient 1: CT chest study at day 10 demonstrating lower zone predominant, bilateral ground-glass opacification with small areas of consolidation.

Fig. 2. Patient 4: CT chest study at day 8 demonstrating lower zone predominant, bilateral ground-glass opacification and consolidation. Acute deterioration at day 11 with admission to ICU.

Fig. 3. Patient 4: Progress CT at day 27 demonstrating extensive, widespread consolidation with air bronchograms, and moderate-sized bilateral pleural effusions, fully ECMO-dependent.

Fig. 4. Patient 4: Progress CT at day 111 demonstrating some residual ground-glass opacities, but with the development of subpleural bands and reticulation, architectural distortion and bronchiectasis.
showed features of COVID-19 described in the literature, including ground-glass opacities with a basal and peripheral predominance (Figs 1 and 2). Two patients recovered from COVID-19. One recovered patient had progress CT imaging four days after the initial CT imaging, which showed very mild improvement. Two of the recovered patients had progress chest radiographs, which showed mild improvement but persisting bilateral alveolar opacities.

The fourth patient (Fig. 2), with diabetes and chronic respiratory conditions, deteriorated and developed severe acute respiratory distress syndrome (ARDS) requiring extracorporeal membrane oxygenation (ECMO). Progress CT scan at day 26 demonstrated worsening consolidation with air bronchograms with bilateral pleural effusions (Fig. 3). This patient remained on ECMO for 41 days. She was eventually weaned from ventilation support and discharged from the hospital. Progress CT at day 111 demonstrated some residual ground-glass opacities, but with features of evolving (Fig. 4).

Significant pre-existing comorbidity was associated with worse clinical outcomes in our small case series. This is consistent with the literature where after adjusting for age, patients with comorbidities (such as coronary artery disease, chronic obstructive pulmonary disease, diabetes and malignancy) were more likely to have adverse clinical outcomes and higher fatality rate. In the middle-aged population, it may be the comorbidity conditions that determine clinical outcome. There appears to be little role for progress imaging in clinically improving patients with mild disease as we noted little radiological resolution in short-term imaging in these patients.

Routine CT imaging for the evaluation of COVID-19 is not recommended. With infection control measures, a CT scan can take up to 2 h at our centre. Chest radiography is accessible and commonly performed. It has an important role in assessing cardiopulmonary comorbidities, which have prognostic value in patients with COVID-19. The role of chest radiography in the assessment of disease severity and prognostication to guide clinical management is unclear at this point.

Progression of disease in middle-aged patients with COVID-19 is probably affected by comorbidities, with limited correlation with initial CT imaging appearances. The most effective use of imaging in COVID-19 is yet to be determined.

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