

# COVID-19 & Hydroxychloroquine side-effects: Glucose 6-phosphate dehydrogenase deficiency (G6PD) and acute haemolytic anaemia

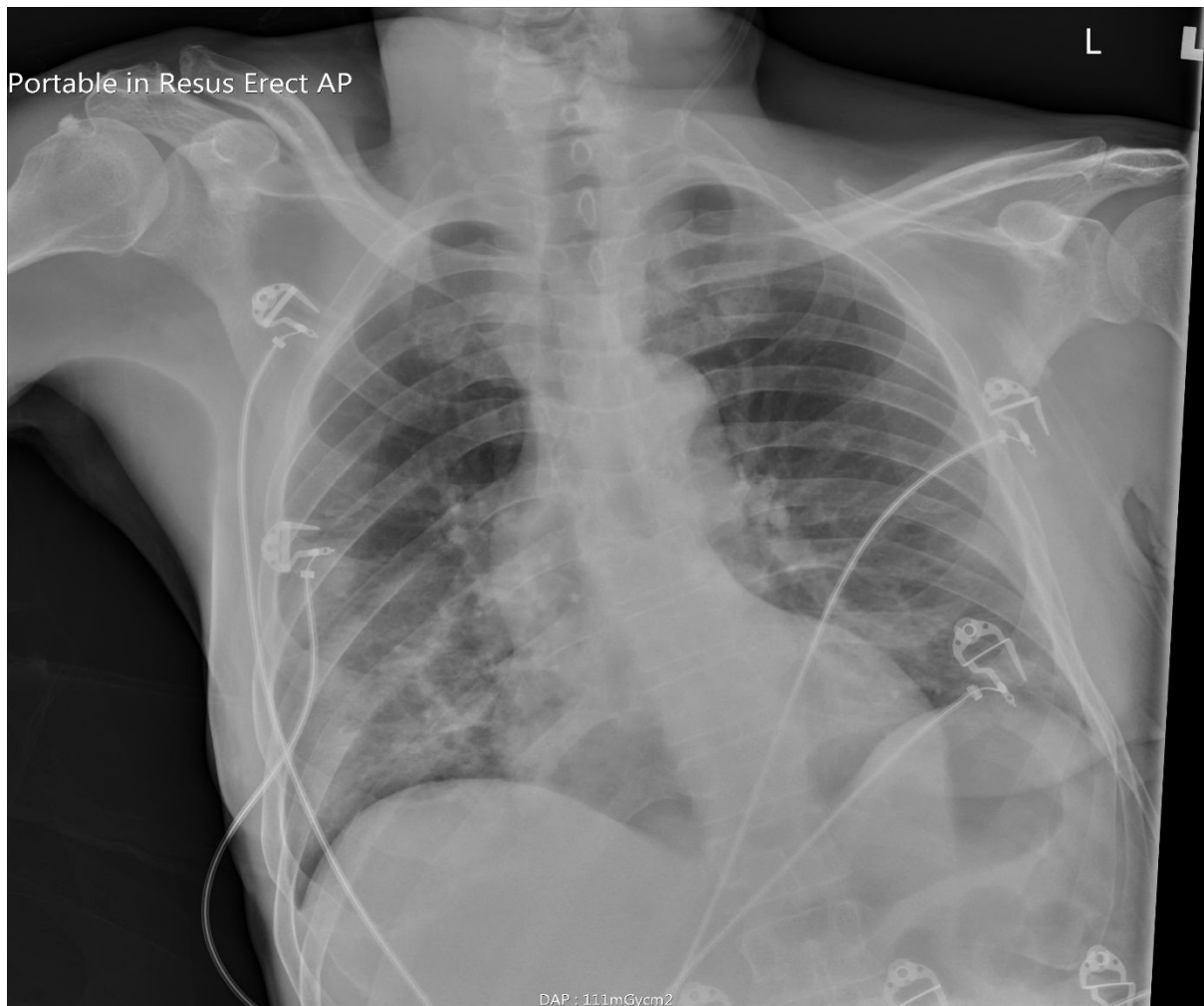
## Authors

- Dr. Stephen Chaney
  - Respiratory department at Tallaght University Hospital
  - Tallaght, Dublin 24, D24 NROA
  - stephen.chaney@gmail.com
- Dr. Ahmad Basirat
  - Respiratory department at Tallaght University Hospital
  - Tallaght, Dublin 24, D24 NROA
  - ahmadbutt@hotmail.com
- Dr. Rachel McDermott
  - Respiratory department at Tallaght University Hospital
  - Tallaght, Dublin 24, D24 NROA
  - rachelmcd14@gmail.com
- Dr. Natalie Keenan
  - Respiratory department at Tallaght University Hospital
  - Tallaght, Dublin 24, D24 NROA
  - keenanna@tcd.ie
- Prof. Eddie Moloney
  - Respiratory department at Tallaght University Hospital
  - Tallaght, Dublin 24, D24 NROA
  - eddie.moloney@tuh.ie

## Case description

A 57-year-old Nigerian male, attended the emergency department with a 4 day history of fatigue, nausea, chills, and anorexia. He had a history of non-insulin dependent diabetes, hypertension, hypercholesterolaemia, gastro-oesophageal reflux disease and glaucoma. He had a mild anaemia on admission (Hb 12.4 g/dl), but no known haematology history.

Examination revealed a dehydrated man with crepitations on auscultation at his right lung base, increased work of breathing, and oxygen requirements of 2 l/min via nasal cannula, with peripheral oxygen saturations of 93%. Imaging with portable chest x ray showed right lower zone consolidation (Figure 1).



Laboratory results showed a urea of 11 mmol/L, a CRP of 61mg/L, blood glucose of 20.3 mmol/L, pH 7.273, and ketones of 6.1. He was treated for a diabetic ketoacidosis (DKA) which was felt to have been precipitated by a community acquired pneumonia.

He responded well to the DKA protocol, where he received 6L of fluid in the first 24 hours while on a fixed insulin infusion. His pneumonia was treated with piperacillin tazobactam initially. On the 2<sup>nd</sup> day of admission, the results of his COVID 19 swab was positive and his antibiotic regime was changed to azithromycin, hydroxychloroquine, and ceftriaxone.

Laboratory monitoring showed a daily drop in his haemoglobin which had reached 6.6 g/dL at its lowest point on day 8 before he was transfused with 2 units of RCC. Biochemistry available at the time showed mildly elevated bilirubin at 35umol/L, LDH of 1636U/L and a ferritin of 9379ug/L.

The haematology service was consulted and the results of a haemolytic screen which were available on day 7 showed reticulocytes of  $68.2 \times 10^9/L$ , direct

coombe's test was negative, haptoglobins were <0.10 g/L. A review of his admission blood film showed irregularly contracted cells, hemi-ghost cells and a possible diagnosis of glucose 6 phosphate dehydrogenase deficiency (G6PD) was proposed.

A blood sample analysis of his G6PD level returned an equivocal result. However it was repeated at the suggestion of the lab which subsequently showed a level of 2.8 IU/gHb indicating deficiency of G6PD.

## Discussion

In the case of a patient with a diagnosis of COVID19 with increasing oxygen requirements, acute severe anaemia can compound the problem and moreover can be life threatening. The role of hydroxychloroquine in the treatment of COVID19 has subsequently been shown to be ineffective (Tang W, 2020), and adverse effects have been reported.

Following his diagnosis of G6PD deficiency, this patient was referred to a haematology unit which specialises in this condition.

## Learning Points

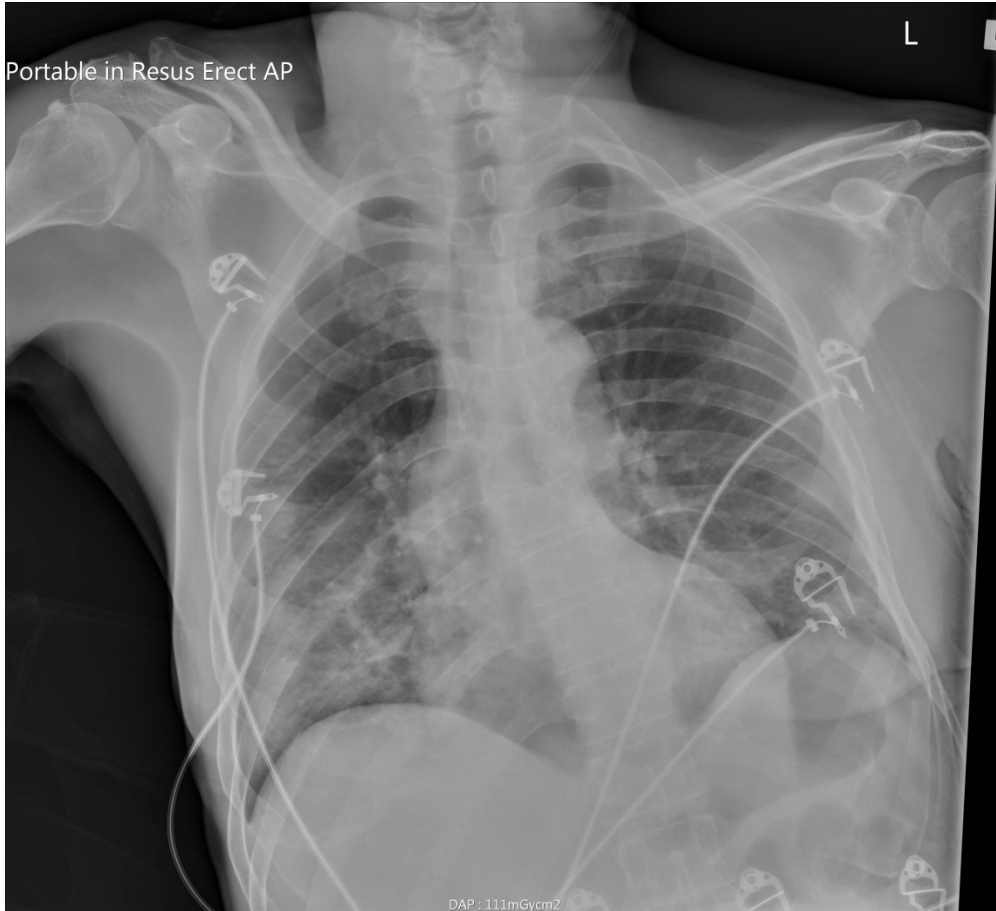
Hydroxychloroquine is not a benign treatment and can trigger significant adverse events.

Unexplained progression of anaemia should prompt early specialist input, and screening for haemolysis is advisable.

Anaemia will significantly compound the issue of respiratory failure in a patient with a separate acute respiratory pathology.

## References

Tang W, C. Z. (2020). Hydroxychloroquine in patients with mainly mild to moderate coronavirus disease 2019: open label, randomised controlled trial. *BMJ*. 2020;369:m1849. Published 2020 May 14. doi:10.1136/bmj.m1849, 1849.



Admission Chest X ray showing a right lower zone infiltrate

651x592mm (120 x 120 DPI)