

# A NEAR FATAL SWIMMING EXPERIENCE RAPID BREATHING DETIORATION FROM ACUTE EXPOSURE OF CHLORINE

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## INTRODUCTION

Chlorine (Cl<sup>17</sup>) is a toxic irritant, whereby inhalation may lead to upper and lower respiratory tract injury with sinister complications such as laryngeal oedema, acute respiratory distress syndrome (ARDS) and pneumonitis.

## CASE REPORT

A 27 years old, Chinese gentleman with no known medical illness presented with a complaint of cough and shortness of breath 5 hours after exposure to chlorine that was being poured into the water filter of the swimming pool in which he was swimming. Duration of exposure was 20 minutes. He also developed bilateral eye redness and minimal haemoptysis. Upon arrival he was peripherally cyanosed and tachypnoeic. His oxygen saturation was 78% under RA and about 88% under high flow mask. Other vital signs were stable. Lungs auscultation revealed bilateral crepitation up to midzone. Chest x-ray showed bilateral alveolar opacities. Bedside ultrasound revealed B-lines in bilateral lungs until upper zone. ABG showed a normal anion gap metabolic acidosis. Patient was initially put on CPAP with a PEEP of 10 and FiO<sub>2</sub> 1.0. The next three hours was uneventful with serial ABGs showing improvement in his P/F ratio. However, 12 hours post exposure, patient was intubated for worsening type 1 respiratory failure. He was then treated as ARDS. Improvement in his oxygenation was noted in ICU 23 hours after exposure. Patient remained ventilated for 70 hours during which his respiratory function gradually improved. He was discharged home well 6 days after exposure.

## DISCUSSION

Chlorine inhalation is one of the many causes of Acute Respiratory Distress Syndrome (ARDS). Although the dose of exposure is unable to be ascertained, acute lung injury is generally seen with exposure to high doses<sup>(5)</sup>.

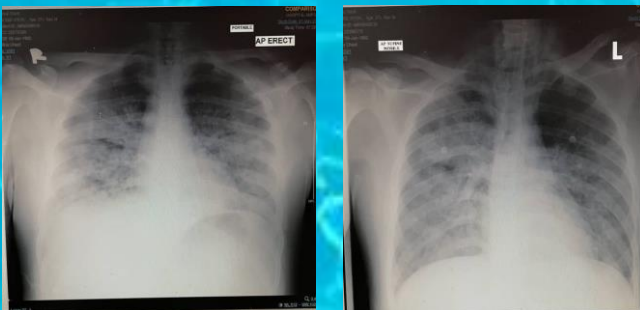
There is still no established treatment protocol for chlorine inhalation lung injury. However, there are few early managements can be beneficial such as:

1. Optimal lung ventilation strategies. High PEEP is recommended to reduce hospital and ICU mortality, as incremental PEEP in ARDS appears to protect the alveoli and improve oxygenation<sup>(1)(2)</sup>.
2. Nebulized Sodium Bicarbonate has been shown to improve FEV1 after Pulmonary Function Tests and had increased the quality of life<sup>(3)</sup>.
3. Inhaled steroid combined with nebulized sodium bicarbonate could be a safe and effective alternative for treatment of the symptomatic patient<sup>(4)</sup>.

As a long term sequelae, exposure to chlorine inhalation may result in Reactive Airway Dysfunction Syndrome (RADS).<sup>(6)(7)(8)</sup> Thus, follow-up for these patients will be required, to determine the progress of symptoms if any. The treatment of RADS is generally similar to asthma. Self-education to increase awareness needs to be provided to the patient.

## CONCLUSION

The symptoms of acute exposure to chlorine may develop in hours and progress rapidly. The risk of rapid deterioration entails prompt diagnosis & intensive monitoring in order to enable early pre-emptive treatment.



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