

# AN UNSUSPECTED DANGER IN OXYGEN ADMINISTRATION

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## INTRODUCTION

Oxygen is administered without a proper prescription (Editorial, Medical Journal of Australia, 1970). This is a disturbing practice as the routine administration of oxygen is not without dangers, some of which are well known while others are unsuspected. We report a case highlighting an unusual danger of oxygen administration.

## CASE REPORT

A five-day-old female infant weighing 3.6 kg. was admitted to the General Hospital, Malacca, Malaysia on 14/1/76, with severe breathlessness of one day's duration, lethargy and poor feeding. She was born at term in a private maternity home after a normal pregnancy and labour and was discharged in apparent good health the day before symptoms appeared.

On examination, she was dyspnoeic with subcostal and intercostal recession; she was not cyanosed. Her respiratory rate was 50 per minute, apex beat 154 per minute and rectal temperature 36.6°C. Respirations were grunting but the lungs and heart were clinically normal. A clinical diagnosis of pneumonia was confirmed by a chest x-ray. Blood culture was sterile.

Intravenous fluids, intravenous ampicillin (125 mg 6 hourly) and intramuscular gentamicin (5 mg 8 hourly) were administered. Oxygen was "prescribed" in the following manner - "O<sup>2</sup> Stat".

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The nurse carried out this order by giving oxygen at the rate of 2 litres per minute by a nasal catheter about 1.5 cm into the right nostril. The infant's condition remained unchanged till eleven hours later when she was noted to be cyanosed and more dyspnoeic with severe stridor. Abdominal distension had developed and a small amount of brownish fluid was vomitted. Bowel sounds were sluggish. Following aspiration via a Ryle's tube, the abdominal distention subsided, bowel sounds improved and the stridor became much less. Ten minutes after the removal of the Ryle's tube, abdominal distension and stridor increased. The Ryle's tube was re-inserted with partial relief of symptoms and was left in situ. A flatus tube was also passed with good result.

Four hours later she developed mild cyanosis, grunting, lethargy, poor muscle tone, depressed neonatal reflexes, slightly tense fontanelle, moderate abdominal distension with absent bowel sounds. Per rectal examination revealed an empty rectum. The apex beat was 130 per minute and the respiratory rate was 60 per minute. A lumbar puncture produced Xanthochromic clear fluid under pressure. The cerebro-spinal fluid was otherwise normal.

At this stage continuous bubbling of air occurred when the Ryle's tube was immersed in water suggesting that the nasal catheter was displaced into the stomach. Withdrawal of the nasal catheter in fact showed that it had been displaced 14 cm from the nostril. This was confirmed by a prior chest x-ray which showed the nasal catheter to be lodged in the oesophagus which was distended (Fig. 1).

With removal of the nasal catheter and administration of oxygen by face mask, the infant improved a little, abdominal distension did not recur and the stridor disappeared. Subsequently however, her condition deteriorated and she died on 16/1/76 - 2 days after admission.



Fig. I Radiograph of chest shows position of the nasal oxygen catheter (single arrow) and Ryle's tube (double arrow). Note the gross distension of the esophagus, stomach and ileum with air.

## DISCUSSION

It is clear that the presenting symptoms in this infant were aggravated by displacement of the intranasal catheter into the oesophagus with distension of the oesophagus and stomach. The development of stridor was probably the result of pressure on the trachea by the distended oesophagus. Partial relief at least was obtained by deflating the stomach and oesophagus via the Ryle's tube.

Rupture of the stomach is a rarely reported complication of oxygen therapy (Pendergrass and Booth 1946, Musser 1956, McCormick 1959). How gaseous distension of the stomach developed in these patients was not satisfactorily explained and Walstad and Conklin (1961) in their review did not consider the possibility of displacement of the nasal catheter into the oesophagus or stomach. In the case reported here the rupture of the oesophagus

and the stomach was probably prevented by release of gas via the Ryle's tube.

It is thus clear that when oxygen is administered via an intranasal tube specific instructions in respect to the rate of flow and the distance the tube is to be inserted must be specified.

In addition it is important that the position of the catheter is checked at regular intervals or that the catheter be suitably marked.

## CONCLUSION

There is a general awareness of the dangers of oxygen administration with respect to the development of carbon dioxide narcosis in patients with respiratory failure and the toxic effects of oxygen to the retina and lungs (Scottish Home and Health Department, 1969). However, little attention has been given to the possibility of gaseous distension of oesophagus and stomach due to a displaced intranasal catheter. Specific instructions in respect to rate of flow and positioning of the intranasal catheter are mandatory when oxygen is administered by this route.

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