

Hydrogen Sulphide in Pulmonary Gases of Ventilated Septic Children: A Potential Marker of Infection



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Background

Hydrogen sulphide (H₂S) is a colourless, water-soluble, flammable gas with the characteristic odour of rotten eggs (Szabo). Despite evidence that H₂S is a potent vasodilator, it's role in inflammation has not, as yet, been adequately addressed (Ling, 2005).

There is increasing interest in using plasma H₂S or it's metabolites as markers of pathological conditions or as a predictive marker of outcome. We speculate that if H₂S does increase in the blood it may diffuse into alveolar gas and be detected in expired gas.

Aim

To determine whether H₂S is expired in ventilated children or neonates with sepsis compared with ventilated control subjects.

Methods

- Ethical approval and parental consent
- Patients were allocated into a control or sepsis group.
- Qualifying criteria for the sepsis group was suspected infection, two or more systemic inflammatory response syndrome criteria and one organ failure.
- A chromatograph (OralChroma, Envin Scientific Ltd Figure 1) was used to measure H₂S in parts per billion.
- Room air was analysed to determine background atmospheric H₂S.
- A 1-2ml sample of expired gas was taken from the endotracheal tube and analysed.
- Sampling repeated after 30 minutes and daily up to a maximum of 5 days or until the patient was extubated.
- Clinical data including C Reactive protein (CRP) around the time of sampling was collected.



Figure 1

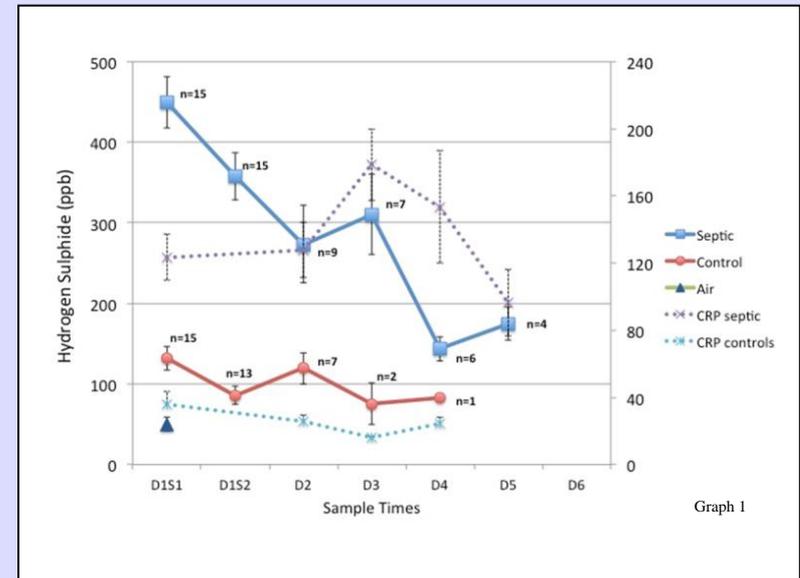
Results

Each group contained 15 subjects. Table 1 shows the median age (m), CRP and expired hydrogen sulphide on day 1.

Study Group	Age (m) Median (range)	CRP Mean (SEM)	Expired H ₂ S Day 1 (ppb) Mean (SEM)
Septic (n=15)	6 (3-20)	132.5 (27.5)	451.4 (65.7)
Control (n=15)	5 (2-15)	36.1 (14.8)	132.1 (29.8)

Graph

Table 1



Graph 1

Conclusion

H₂S can be detected in expired lung gases. Higher quantities are seen in septic patients compared with controls. More detailed information on timing of rise and it's translation into clinical practice are ongoing.