

Establishing normal values for hydrogen sulphide in breath testing.

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INTRODUCTION

- Hydrogen and methane breath testing (HMBT) is well established for the diagnosis of SIBO, IMO and CM
- Microbial fermentation also produces hydrogen sulphide (H₂S) which is associated with diarrhoea and inflammation in IBD and IBS.
- Using SIFT-MS we can detect parts per billion range to establish normal values.

METHODS

- 25 healthy volunteers completed a 3hr lactulose breath test.
- Breath samples were taken at baseline (0mins) and 45,90,180 minutes post lactulose ingestion.
- Samples were collected using 500ml polyvinylidene fluoride bags and analysed using SIFT-MS.
- The breath test was then repeated after 28 days of iron supplementation.

RESULTS

- Hydrogen Sulphide levels at visit 1 were approximately 20ppb (**Figure 1**)
- After 28 days of iron supplementation (visit 2), H₂S decreased significantly at baseline (p=0.027) (**Figure 1**)
- In healthy volunteers, hydrogen sulphide levels did not change in response to a lactulose challenge (**Figure 1**), however **Figure 2** demonstrates an example of a symptomatic patient (who did not take part in the study).

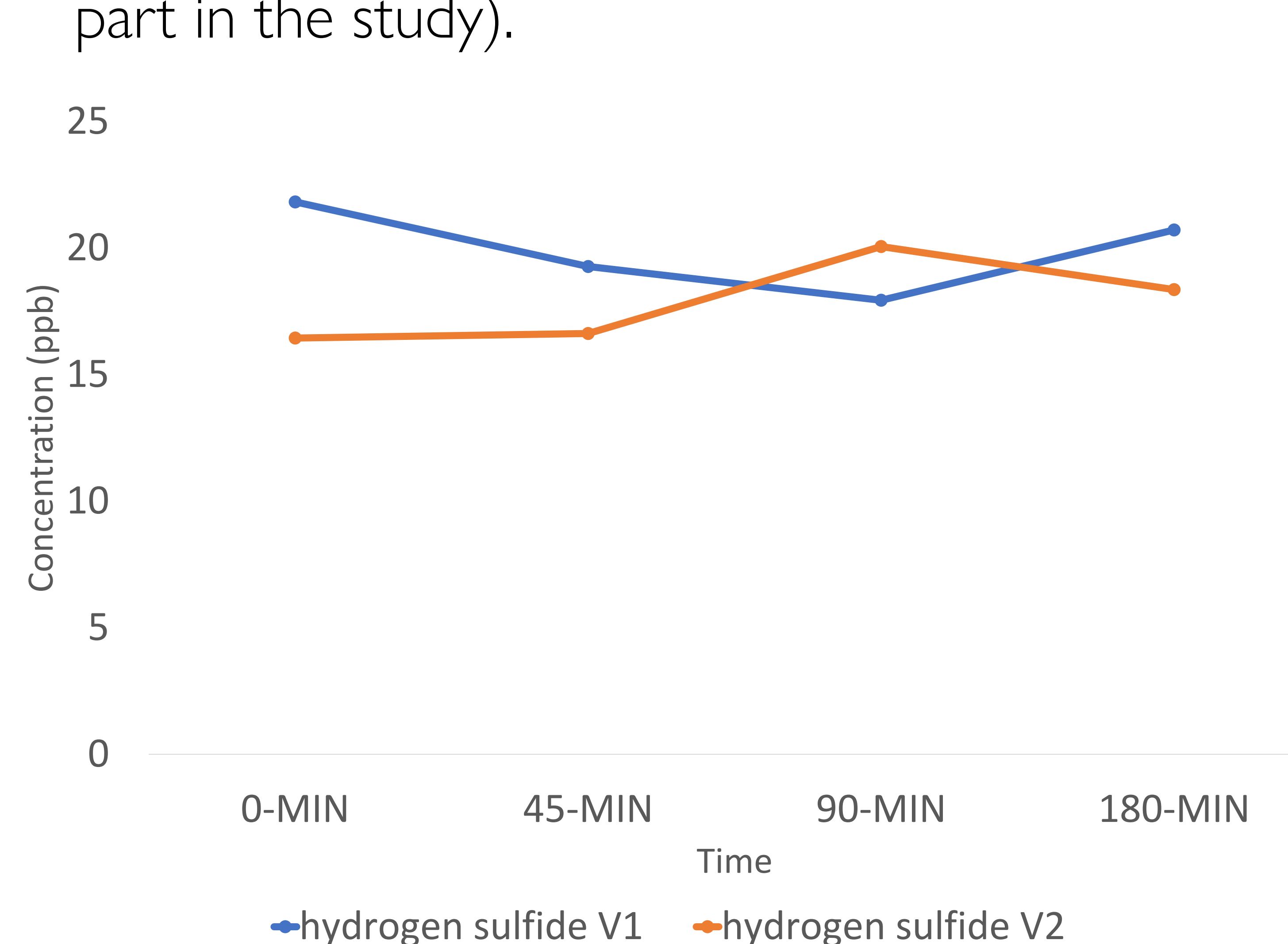


Figure 1: Hydrogen sulphide values pre-iron supplementation (V1) and post iron supplementation (V2) in healthy volunteers

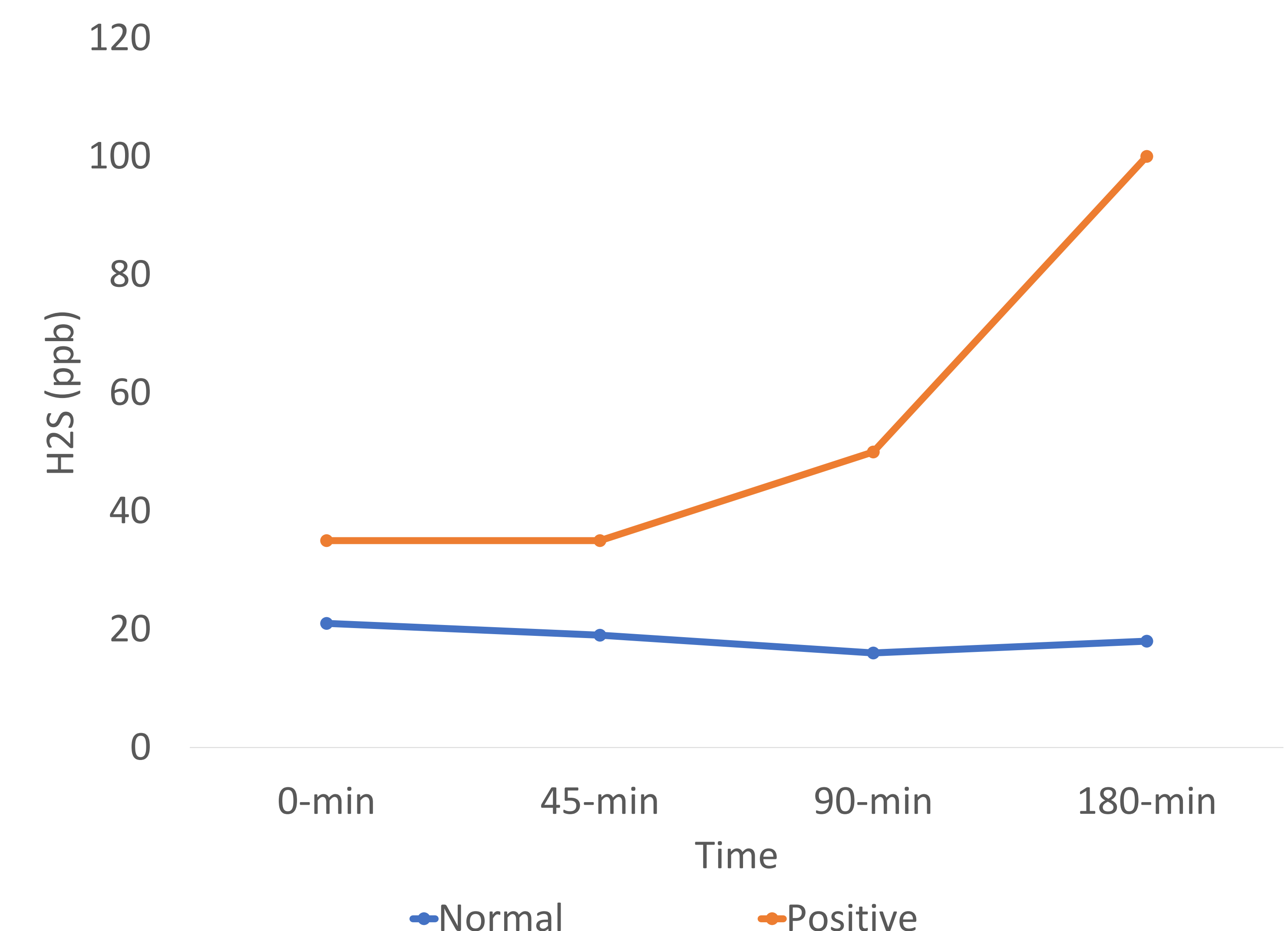


Figure 2: Hydrogen sulphide levels in a symptomatic patient, shows significant rise at 180 and 240 minutes.

CONCLUSION

- We have established a normal range of hydrogen sulphide in healthy volunteers as less than 25ppb.
- Hydrogen sulphide does not respond to lactulose challenge in healthy volunteers, and this could be due to a healthy microbiome so an individual baseline measurement may be sufficient for assessing H₂S.
- After 28 days of iron supplementation, hydrogen sulphide levels decreased significantly, suggesting that iron supplementation can improve hydrogen sulphide levels.
- A symptomatic patient experienced a strong hydrogen sulphide response to lactulose.