Reviewer's report

**Title:** The Correlation and Level of Agreement Between End-tidal and Blood Gas pCO2 in Children with Respiratory Distress: A Retrospective Analysis

**Version:** 1  **Date:** 9 October 2008

**Reviewer:** Anne Greenough

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1. The authors describe the results of a retrospective study into the correlation between venous and end-tidal C02 measurements in 62 paediatric in patients who had asthma (41) bronchiolitis (9) or pneumonia (12). These children were highly selected as not having a chronic cardiac or respiratory problems not requiring intubation or having a metabolic acidosis. They also needed to have the results of a venous blood gas analysis recorded in the notes within 10 minutes of an end-tidal C02 documentation. As a result, only 80 measurements were available over an 18 month period at a large children’s hospital. Their main aim was to see whether end-tidal C02 measurement could be used to replace blood gases in non intubated children with moderate or severe acute respiratory problems.

2. The authors found that the end-tidal C02 results under recorded the various results by on average 4 mnHg. There was a reasonable correlation between the two techniques, particularly in the children with pneumonia, but with a scatter of results in those with asthma. They conclude that end-tidal C02 measurements cannot be used as a substitute for blood gases, although the correlation was close with C02 levels below 35 mnHg.

3. This is a well written, clear statement. There are no ethical problems.

4. I have no particular criticisms of the text or figures.

5. I am concerned that they have used 80 measurements on 62 children as this will introduce bias into the correlations.

6. My main concerns are of the design of the study which limits its value. These are that this is a relatively small retrospective study with no attempt to assess the reproducibility of the measurements or the clinical assessments which are used in the regression analysis. In addition, no attempt has been made to check whether clinical decisions based on the end-tidal C02 measurement would differ from those based on the various blood gas results. These questions could be answered in a larger prospective study which could define the role of end-tidal C02 measurements.

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable
**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare I have no competing interests.