ABSTRACT

Title:
COMPARISON OF PaO2/FiO2 (PF RATIO) AND SpO2/FiO2 (SF RATIO) IN CRITICALLY ILL CHILDREN REQUIRING RESPIRATORY SUPPORT IN A TERTIARY CARE CENTRE IN SOUTH INDIA.

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Key Words: SF ratio, PF ratio, Oxygenation index, Oxygen saturation index, ARDS.

Aims and objectives:

1. To correlate the relationship between PaO2/FiO2 (PF) ratio and SpO2 /FiO2 (SF) ratio in critically ill children requiring respiratory support.

2. To determine the cut off value for SF ratio in relation to PF ratio to diagnose ARDS in our setting.
3. To analyze the relationship between Oxygenation index (OI) and Oxygenation Saturation index (OSI) in children with ARDS.

**Materials and Methods:**

This is a prospective observational study done in the department of Paediatric intensive care unit of Christian medical college, Vellore for a time period of seven months from February till August in the year 2016.

**Inclusion criteria:**

1) All children who needs oxygen supplementation and requiring respiratory support with known FiO2.

**Exclusion criteria:**

1) Children with suspected or probable Congenital heart disease or any anatomic anomalies of lung, chronic lung disease.

2) Children (parents) who decline to give consent to participate in the study.

**Methodology:**

Children admitted in PICU, who fulfilled the inclusion criteria, at the time of admission, when the first arterial blood gas is done, Pao2 and Spo2 are measured
simultaneously and these were documented in a standard proforma. The Fractional inspired oxygen (FiO2) which is administered to the patient at that point will also be documented. A second sample would be done at any point if the child deteriorates needing escalation of respiratory support or at 24 hours. The PF ratio, SF ratio shall be calculated using the documented variable – SpO2, FiO2, PaO2 and analysed to correlate the relationship.

ROC curve and AUC was calculated to find out the cut-off value of SpO2/FiO2 (SF) ratio and Oxygenation saturation index.

**Results:**

The relationship between SF ratio and PF ratio was described by the following linear regression equation. $SF = 134.28 + (0.17 \times PF)$ p value $< 0.05$ $R^2 = 0.1735$. SF ratio of 180 corresponded with PF ratio of 300. The SF ratio of 180 had 70% sensitivity and 65% specificity. The positive predictive value was 80.9% and the negative predictive value was 57.3%. Oxygenation index more than 4 also correlated well with SF ratio with the AUC of 0.7048 with 95% CI (0.607 to 0.808). The oxygen saturation index more than five also correlated with oxygen index more than four with AUC of 0.8974 with 95% CI (0.8457 to 0.9491).
Conclusions:

Our study proved a good correlation between SF ratio and PF ratio and SF ratio can be reliably used as a surrogate marker for PF ratio in diagnosing ARDS in children in the absence of arterial blood gas.