We observed that poor psychosocial care had high association with malnutrition, and that the interactions between SAM children and their parents were less optimal than for the controls. The restriction of movement leading to lesser interaction with the surroundings, curtailed independence, volition activity, and the ability to ask for or obtain food could lead to malnutrition [4]. If mother is also illiterate, it further increases the chances of developing severe acute malnutrition [5]. The limitations of this study were small sample size and a hospital-based setting that could not delineate the actual home environment.

We feel that it is imperative that the psychosocial care environment of the child suffering with severe acute malnutrition be thoroughly probed using a questionnaire such as the one suggested in our study, and psychosocial care and rehabilitation should be brought into focus and stressed during the management of the malnourished child.

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Oxygen Saturation Index – A Noninvasive Tool for Monitoring Hypoxemic Respiratory Failure in Newborns

Neonatal lung disease is assessed using oxygenation index or PaO2 to FiO2 ratio. Both these measures require painful arterial punctures [1-3].

Continuous monitoring of these babies is done by measuring oxygen saturation with pulse oximeter (SpO2). SpO2 is linearly related to partial pressure of oxygen in the middle portion of oxygen dissociation curve. Most of the sick children on ventilatory support fall in this range. Hence noninvasive Oxygen saturation index (OSI) can be used in lieu of OI. OSI is calculated by dividing the product of mean airway pressure (MAP) and FiO2 with SpO2, and has been validated in pediatric population [4]. However, there are no prospective studies done exclusively in neonates.

We set out to find out the correlation between OI and OSI as well as determine the values of OSI corresponding to mild, moderate and severe lung disease.

This was a prospective study conducted on mechanically ventilated neonates who had blood sampling done for arterial blood gas measurement for their clinical indications. Neonates with congenial heart disease and who had SpO2 above 98% were excluded. Arterial blood gas was done using Gem 6000 machine 30 seconds after recording a stable SpO2 from post-ductal site with Philips intellivue monitor.

Formulae used for calculation of OSI:

OSI = (MAP) X (FiO2)) / (SpO2). FiO2 and SpO2 are expressed as decimals

OI = (MAP) X (FiO2%) / (PaO2)

Pearson product moment correlation and Correlation coefficient with linear mixed effect model between OI and OSI and OSI corresponding to OIvalues for mild, moderate and severe disease (OI of <5, 5-15 and >15) was calculated. Fifty-four neonates, both term and preterm, were recruited. Thirty six neonates were on conventional, and 18 were on high frequency ventilation. A total of 141 datasets were obtained. Minimum SpO2 recorded was 70% in one patient. Pearson product moment correlation (r) for OSI and OI was 0.91 (***Fig.* 1**). Sub group analysis yielded R = 0.96 for babies on high frequency and R = 0.95 for babies on conventional ventilation ($P<0.001$). Linear Mixed effect model yielded the y intercept of 1.6 and

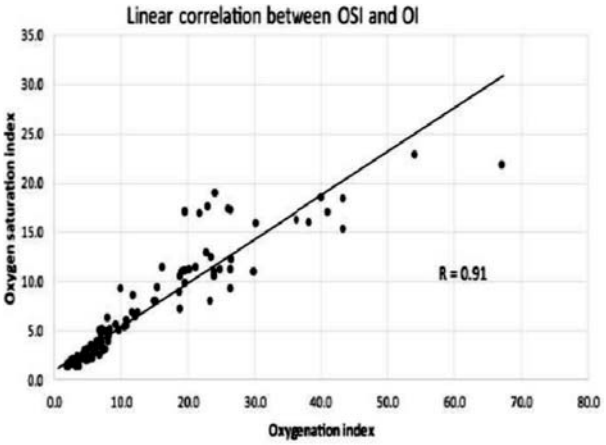

FIG. 1 *Correlation between Oxygen saturation index and Oxygenation Index.*

constant (B) of 0.4 for OSI; OSI = 1.6 + 0.4 OI (P = 0.001).

OI of 15 represented a PF ratio of 100 with sensitivity of 97% and specificity of 100%. OI of 5 represented a PF ratio of 200 with sensitivity of 94.7% and specificity of 93.5%. Hence OI of 5 and 15 represented moderate and severe disease, respectively. OSI of 3 and 6.5 corresponded to OI of 5 and 15, respectively with high sensitivity and specificity (***Table* I**).

OI has traditionally been the assessment tool for acute lung disease in newborn [5-7] and need for arterial sampling is its major limitation. OSI can overcome this limitation. In our study OSI has shown high correlation of 0.91 with OI. Such non-invasive assessments have the potential to reduce invasive procedures, workload and cost.

Several other retrospective studies have noted high correlation between OSI and OI [8-10]. We conclude that OSI has high correlation with OI in neonates with hypoxemic respiratory failure, and it has the potential to be used, both in clinical management and research, to quantify the severity of lung disease.

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TABLE I OXYGEN SATURATION INDEX CUJT-OFFS FOR DIFFERENT OXYGENATION INDEX

Oxygenation Index	*<5 (Mild)*	*5 - 15 (Moderate)*	*>15 (severe)*
Oxygen Saturation Index	2.9	3.0	6.5
Sensitivity	89	89.4	100
Specificity	93	93.6	93.7

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