

The Clinical Utility of Lactic Acid Testing with ABGs in the Neonatal Setting: A Case Study

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Case

A 19 year old female presented to the hospital with increasing labor pains and delivered an otherwise normal 3 lb neonate. The neonate was placed under an infant warmer with an Oxyhood at 100% O₂.

After a period of one hour the patient's respiratory rate increased to 60 with mild retractions noted.

A blood gas was ordered and run on the Roche cobas b 221 blood gas system.

The following results were reported:

Parameter	Reported Value	Neonatal Normal Ranges
pH	7.331	7.35 - 7.50
PCO ₂	44.3	35 - 45
PO ₂	225.0	50 - 80
HCO ₃	22.9	22 - 26
tHb	20.5	13 - 22
SO ₂	99.5%	< 90
Glu	60	80 - 120
Lac	6.2	< 2.0

Assessment

The patient had a normal SO₂ of 99.5% normal PCO₂, normal HCO₃ and all electrolytes were in normal range. Based on ABG values and physical appearance, the patient appeared normal with increased respirations attributed to its premature condition. Upon closer review of the ABG results along with the lactic acid level of 6.2 mmol which is three times the upper limits of the normal range, the patient was diagnosed with Infant Respiratory Distress Syndrome. This syndrome increases the breathing rate in response to incomplete lung development characterized by reduced amounts of lung surfactant, cyanosis, the formation of a glassy membrane over the alveoli and pulmonary collapse. As respiration increases inspiratory muscles work harder to provide oxygen. The increased muscle activity results in utilization of glucose and increase in lactic acid in the bloodstream due to the inefficiency of the neonatal liver to convert the lactic acid to pyruvic acid.

Treatment

The patient was transferred to the NICU, administered bicarbonate, glucose, surfactant and placed on nasal CPAP overnight. The nasal CPAP was removed the next day.

Conclusion

Lactic acid and glucose as part of a neonatal ABG panel provides greater diagnostic capabilities in assessing and treating Infant Respiratory Distress Syndrome and related conditions.

Recommendation

All NICU blood gas analyzers should have the ability to run lactic acid and glucose like the Roche cobas b 221 system. All neonatal blood gas panel should include lactic acid and glucose as a standard of care in the neonatal setting.