



Infant Resuscitation using Sodium Bicarbonate Infusion

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DESCRIPTION

Bicarbonate therapy is frequently utilised in many neonatal intensive care units despite the lack of evidence supporting its efficacy in the treatment of acid-base imbalances in critically sick children of all ages and despite multiple lines of evidence suggesting it might be hazardous. Many of the justifications for the continued use of this contentious therapy are more philosophical than scientific in nature. When considering the use of bicarbonate therapy, clinicians should think about what they hope the intervention will achieve and what proof there is that their therapeutic goal will be achieved. This therapy should be regarded as experimental because it lacks solid scientific backing and hence has unknown value.

There is very little research that either supports or refutes the use of drugs in newborn resuscitation. They examined the impact of sodium bicarbonate administered during neonatal resuscitation on survival and neurological prognosis at discharge in this randomised controlled experiment. Subjects and procedures Sodium bicarbonate or 5% dextrose were given to consecutively born asphyxiated newborns that needed positive pressure breathing at 5 minutes of life. The study group received 4 ml/kg (1.8 meq/kg) of intravenous sodium bicarbonate solution over the course of 3 to 5 minutes. 7.5% sodium bicarbonate (0.9 meq/ml) was diluted with distilled water in a 1:1 ratio to create this solution. An equal amount of undiluted 5% dextrose (4 ml/kg) was given to the placebo group. At discharge, the neurological state of the living neonates was assessed. Death or an unfavourable neurological evaluation following discharge is the primary outcome variables. Intraventricular haemorrhage (IVH), multi-organ failure, encephalopathy, and arterial pH at 6 hours are secondary outcome factors.. Incidence of encephalopathy (74% vs. 63%), cerebral oedema (52% vs. 30%), requirement for inotropic support (44% vs. 29%), Intraventricular Haemorrhage (IVH), and mean arterial pH at 6 hours were comparable in the two groups. Sodium bicarbonate was not administered during neonatal resuscitation to help with survival or the immediate neurological prognosis.

When sodium bicarbonate became commercially available in the late 1950s, Neonatal Intensive Care Units (NICUs) quickly adopted it as a standard treatment for metabolic acidemia, resuscitation of newborn infants who were in distress, and prevention of azotemia, hypoglycemia, and increases in serum potassium levels (the so-called Usher regimen). The use of sodium bicarbonate infusions during newborn resuscitation and after cardiac arrest has persisted despite the lack of evidence to support the practice. Additionally, sodium bicarbonate treatment might be harmful. In cells, raising the bicarbonate content could strangely result in a situation where the intracellular pH is paradoxically lowered rather than normalizing it. On the other hand, prolonged treatment of sodium bicarbonate has shown effective when metabolic acidosis is primarily caused by bicarbonate loss from the kidney or digestive system. Following a brief review of basic acid-base physiology, a number of specific clinical disorders in newborns are described in terms of acid-base physiology and physiological evidence for bicarbonate therapy.

Sodium bicarbonate intravenous infusion given to newborns during resuscitation in the delivery room upon birth. Some newborns who do not breathe on their own have an abnormally high level of acid in their blood at birth. Sodium bicarbonate, an alkaline medication, has frequently been administered intravenously to treat condition. Although this has been a widespread practice for more than 30 years, there is no solid proof that it is advantageous and it could even be harmful. Only one high-quality trial that compared sodium bicarbonate treatment with no treatment was available, and it involved 55 infants. The study found neither a benefit for using this medication soon after delivery nor any negative consequences.

Although sodium bicarbonate has been used in neonatal clinical practice for a long time, it is not clear whether using it to raise plasma pH in most acute situations involving metabolic acidosis in neonates will result in better clinical outcomes. The research that is now available indicates that the severity of metabolic acidosis in these circumstances reflects the seriousness of the underlying illness rather than directly causing mortality.

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Received: 25-Nov-2022, Manuscript No. JNB-22-19614; **Editor assigned:** 28-Nov-2022, Pre QC No. JNB-22-19614(PQ); **Reviewed:** 14-Dec-2022, QC No. JNB-22-19614; **Revised:** 21-Dec-2022, Manuscript No. JNB-22-19614(R); **Published:** 29-Dec-2022, DOI: 10.35248/2167-0897.22.11.383.

Citation: Sahni R (2022) Infant Resuscitation using Sodium Bicarbonate Infusion. J Neonatal Biol. 11:383.

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