Welcome to the sixth Inhaled Nitric Oxide Registry newsletter. We will be issuing a newsletter biannually to provide you with updates and feedback on the data that has been submitted by collaborating centres.

Statistics

To date, information has been collected from over 1,190 children treated with iNO from 43 neonatal and paediatric intensive care units in 13 countries who have registered with the iNO Registry. Numbers of patients by type are as follows:

- 973 - Neonatal without cardiac diagnosis (type 1)
- 192 - Neonatal or paediatric with cardiac diagnosis (type 2)
- 31 - Paediatric without cardiac diagnosis (type 3)

New collaborating centre

Welcome to the Medical University of Warsaw, Poland, who has recently joined the iNO Registry. You can find information on all iNO Registry collaborators on our website at www.medscinet.net/INO/

The use of inhaled nitric oxide in preterm infants following preterm pre-labour rupture of membranes (PPROM)

Preterm pre-labour rupture of membranes (PPROM) is rupture of the membranes with loss of amniotic fluid occurring at least 24 hours prior to labour in a preterm infant. Typically PPROM that occurs in the second trimester is associated with oligohydramnios and pulmonary hypoplasia resulting in high mortality and morbidity in survivors. PPROM affects approximately 0.5% of pregnancies with a half of mothers delivering within one week after rupture of membranes and 70% within five weeks.

Although early studies suggested a very high mortality (up to 80%) following PPROM where the latent period pre-delivery was at least one week, more recently it has been suggested that the prognosis has improved substantially with the widespread use of antenatal steroids, postnatal surfactant therapy, high frequency oscillation and inhaled nitric oxide. One study of PPROM occurring before 24 weeks gestation suggested the survival was as high as 90% for those admitted to the neonatal ICU [1].

Pulmonary hypoplasia is associated with lung airway, parenchyma and pulmonary vascular mal-development resulting in hypoxaemic respiratory failure and pulmonary hypertension. In one study, 15% of preterm infants < 32 weeks’ gestation born following PPROM developed hypoxaemic respiratory failure with PPHN [2]. Inhaled nitric oxide (iNO) is a treatment frequently used to lower pulmonary vascular resistance and pulmonary arterial pressure in order to reverse extrapulmonary shunting and improve oxygenation. Previous studies have shown that iNO is a potentially effective therapy in PPROM and pulmonary hypoplasia. To date there have been eight case reports/series and a sub-group of a randomised controlled trial reporting the short and longer-term outcomes of preterm infants treated with iNO after PPROM in the second trimester. Cumulatively, 63/67 (94%) infants treated with iNO showed a short-term response in oxygenation and 53/62 (85%) survived to discharge [3].

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The Inhaled Nitric Oxide Registry collects information on the outcome of neonates treated with iNO for a variety of conditions, including pulmonary hypoplasia. Currently in the Registry there are 71 preterm infants treated for pulmonary hypoplasia (median gestation 29 weeks, median birth weight 1.31 kg). Of these, 94% received surfactant therapy and 69% received high frequency ventilation prior to starting iNO. Approximately two-thirds of babies underwent baseline pre-iNO echocardiography with approximately 90% having evidence of pulmonary hypertension and/or extrapulmonary shunting (i.e. PPHN). The median baseline oxygenation index was 41 but this had fallen to 20.2 within 30-60 minutes of starting iNO therapy. Inhaled nitric oxide was continued for a median (range) of 2 (0-41) days.

Survival to discharge from hospital in babies with pulmonary hypoplasia was only 55%. This suggests there may be important differences between the population of infants whose data was submitted to the Registry from those in published reports. Previously published reports have generally included all babies born following PPROM (rather than selecting those with clinically relevant pulmonary hypoplasia), babies with lower baseline oxygenation indices and fewer with echo-confirmed pulmonary hypertension.

Babies with pulmonary hypoplasia with data submitted to the Registry comprises the largest single cohort of such infants treated with iNO. As such this cohort may provide more reliable and representative information iNO-treatment outcomes than existing smaller published studies.

References


Contact us

Please let us know what you would like to see on our website and in our newsletters. Email our administrator Julie Wray at iNORegistry@lwh.nhs.uk if you would like to join the iNO Registry or if you require any further information.