Car seats are not necessarily safe for infants

Newborn infants may be at risk of breathing difficulties if left in car safety seats for long periods particularly when travelling, according to a study funded by the Lullaby Trust and published in *Archives of Disease in Childhood Fetal and Neonatal Edition*.[1] Researchers developed a motion simulator to reproduce vertical vibrations akin to travelling at 30mph on a straight urban road, without braking, acceleration or going over bumps. They looked at how vibrations affected babies' heart and lung functions. Term and preterm babies showed significant signs of potentially negative cardiorespiratory effects (increased heart and respiratory rates, decreased oxygen saturation).

Project leader Consultant Paediatrician Dr Renu Arya says: "Parents should not stop using car safety seats to transport their infants, however, our findings support the American Academy of Paediatrics' guideline that infant car seats should not be used as a routine sleep environment."

Reference

1. **Arya R et al.** Is the infant car seat challenge useful? A pilot study in a simulated moving vehicle. *Arch Dis Child Fetal Neonatal Ed* 2016 doi: 10.1136/archdischild-2016-310730.

Study fails to explain the cause of preterm birth

A multinational study published in *PLoS ONE*[1] found that most preterm births have no known biological cause. It compared data sets for mothers in Sweden, Czech Republic, Slovenia, New Zealand and the state of California to determine how multiple risk factors might affect a mother's risk of delivering a preterm baby.

The two greatest risk factors for preterm birth are a prior preterm birth and pre-eclampsia but this study looked at a range of known risk factors and how they might interact. More than 65% of the total aggregated risk of preterm birth within each country lacked a plausible explanation, and 63% of the difference between countries could not be explained with known factors.

Reference

1. **Ferrero D.M. et al.** Cross-country individual participant analysis of 4.1 million singleton births in 5 countries with very high human development index confirms known associations but provides no biologic explanation for 2/3 of all preterm births. *PLoS ONE* 2016;11:e0162506.

Little or no benefit shown from progesterone to prevent preterm birth

Previous research has suggested that progesterone can prevent premature birth and that it could be offered to women at high risk of preterm delivery. However a large study published in the *Lancet*[1] suggests the balance of risk and benefit is not simple.

In the OPPTIMUM study, vaginal progesterone given to at-risk women did not reduce the risk of premature birth compared to a placebo. Consequences for the baby in the first 28 days of life and children at two years of age were also similar when looked at as a whole. There were slightly fewer deaths or cases of brain injury around birth with progesterone. At two years of age childhood brain function was no different between the groups. On the basis of moderate-to-low-quality evidence, NICE guidelines suggest that prophylactic progesterone should be offered to women, with or without a history of preterm birth, who also have a short cervix. The OPPTIMUM study offers no support for prophylactic progesterone; the authors suggest that NICE may wish to revise its guidance.

Reference

1. **Norman J.E. et al.** Vaginal progesterone prophylaxis for preterm birth (the OPPTIMUM study): a multicentre, randomised, double-blind trial. *Lancet* 2016;387:2106-16.

Mum's high-fat diet may have a lasting impact on infant gut

A mother's high-fat diet during pregnancy could have a lasting impact on the bacteria living in her baby's gut, according to a study published in *Genome Medicine*.[1]

The potential impact of the maternal diet was investigated using DNA-sequencing to analyse the composition of the bacterial community present in the infants' stool samples, which were taken post-delivery and at four to six weeks of age. The mothers' eating habits during pregnancy were assessed by use of a questionnaire. Researchers found an association between mothers' diets and distinct changes in their infants' microbiome; a high-fat diet was significantly associated with fewer numbers of Bacteroides microbes. The changes in the microbiome were present from birth until at least six weeks of age.

According to the researchers, a persistent reduction of Bacteroides species in the infant gut could have significant consequences for energy extraction from food and immune development. They suggest the findings have implications for dietary recommendations in pregnancy; however, further studies are needed to demonstrate if changes in mothers' diets have a beneficial impact on their infants.

Reference

1. **Chu D.M. et al.** The early infant gut microbiome varies in association with a maternal high-fat diet. *Genome Med* 2016 doi: 10.1186/s13073-016-0330-z.

Majority of stillbirth cases remain unexplained

A team from Great Ormond Street Hospital (GOSH) looking at the effectiveness of the post mortem process has shown that in the majority of cases of stillbirth, the cause of death remains unknown. The GOSH team carried out a detailed analysis of findings from a large number of post mortem examinations investigating stillbirth and earlier deaths in the womb to see which aspects of the examination provide the most information about why the baby has died.

The findings from the research, funded by Sands, the stillbirth and neonatal death charity, are highlighted in a series of articles in *Ultrasound in Obstetrics and Gynecology*.

Lead researcher Professor Neil Sebire, GOSH Consultant Paediatric Pathologist, says: "The problem is that using current methods, even including full autopsy, we are still often not able to find out why the baby has died. It's therefore vitally important that we advance better ways of properly investigating these cases by developing more refined techniques."

Breastfeeding reduces pain in most babies

A Cochrane review[1] found that breastfeeding before and during vaccination injections helped to reduce pain in most infants up to the age of one year.

The literature search examined the effectiveness of breastfeeding infants during the use of needles. The reviewers compared effectiveness of breastfeeding in reducing pain (as scored by crying time and pain scores) to holding, infants lying flat, or the giving of water or sweet solutions.

Breastfeeding reduced crying in young infants having vaccinations. On average, breastfed infants cried for 38 seconds less than those who were not breastfed, and pain scores were significantly lower. More research is needed to see if breastfeeding might help during other painful hospital procedures.

Reference

1. **Harrison D. et al.** Breastfeeding for procedural pain in infants beyond the neonatal period. *Cochrane Database Syst Rev* 2016:CD011248.

STROBE-NI aims to reduce knowledge gap of neonatal sepsis

Neonatal infections are estimated to account for a quarter of neonatal deaths yet despite this, there is little information available on incidence, aetiology and outcomes, particularly regarding impairment. The SPRING (Strengthening Publications Reporting Infection in Newborns Globally) group aims to develop guidelines for improved scientific reporting of observational neonatal infection studies, to increase comparability and to strengthen research in this area.

Strengthening the Reporting of Observational Studies in Epidemiology for Newborn Infection (STROBE-NI) was developed following systematic reviews of the literature, compilation of more than 130 potential reporting recommendations, and circulation of a survey to relevant professionals worldwide, eliciting responses from 147 professionals from 37 countries.[1]

An international consensus meeting of 18 participants identified priority recommendations for reporting. Implementation of these STROBE-NI recommendations, and a linked checklist, will improve scientific reporting of neonatal infection studies, increasing data utility and allowing meta-analyses and pathogen-specific burden estimates to inform global policy and design of effective treatment and prevention strategies, such as maternal immunisation.

Reference

1. **Fitchett E.J.A. et al.** Strengthening the Reporting of Observational Studies in Epidemiology for Newborn Infection (STROBE-NI): an extension of the STROBE statement for neonatal infection research. *Lancet Infect Dis* 2016;16:e202-13.

Report details array of brain defects from Zika virus

A special report has been published in *Radiology* detailing the spectrum of imaging findings in infants and fetuses infected with the Zika virus.

Zika virus is most dangerous when transmitted from a pregnant mother to her fetus, increasing the likelihood of severe brain defects in the baby. Zika has also been linked to eye defects, hearing impairment and stunted growth in babies.

In addition to microcephaly, the report identifies a wide array of brain defects, visible on CT, MRI and ultrasound including grey and white matter volume loss, brainstem abnormalities, calcifications, abnormalities of the corpus callosum and ventriculomegaly.

Reference

1. **Soares de Oliveira-Szejnfeld P. et al.** Congenital brain abnormalities and Zika virus: what the radiologist can expect to see prenatally and postnatally. *Radiology* 2016 doi: 10.1148/radiol.2016161584.

Preventing BPD: which non-invasive strategy is best?

Various non-invasive ventilation strategies are used to prevent bronchopulmonary dysplasia (BPD) in preterm infants, however, the best mode is uncertain. A systematic review in *Journal of the American Medical Association*[1] has compared seven ventilation strategies for preterm infants including nasal continuous positive airway pressure (CPAP) alone, intubation and surfactant administration followed by immediate extubation, less invasive surfactant administration (LISA), non-invasive intermittent positive pressure ventilation, nebulised surfactant administration, surfactant administration via laryngeal mask airway, and mechanical ventilation.

The study looked at randomised clinical trials comparing ventilation strategies for infants <33 weeks' gestation within 24 hours of birth who had not been intubated (5,598 infants involved in 30 trials). The primary outcome was death or BPD at 36 weeks' postmenstrual age.

The authors concluded: "Among preterm infants, the use of LISA was associated with the lowest likelihood of the composite outcome of death or BPD at 36 weeks' postmenstrual age. These findings were limited by the overall low quality of evidence and lack of robustness in higher-quality trials."

Reference

1. **Isayama T. et al.** Association of non-invasive ventilation strategies with mortality and bronchopulmonary dysplasia among preterm infants: a systematic review and meta-analysis. *JAMA* 2016;316:611-24.