

JOINT EVENT



23rd Edition of International Conference on

Neonatology and Perinatology

&

4th International Conference on

Pediatrics and Pediatric Surgery

April 23-24, 2019 London, UK

Workshop

Day 1

Neonatology 2019 & Pediatrics Surgery 2019

23rd Edition of International Conference on **Neonatology and Perinatology**
&
4th International Conference on **Pediatrics and Pediatric Surgery**

April 23-24, 2019 London, UK



Clare Gilbert

London School of Hygiene & Tropical Medicine, UK

Update on retinopathy of prematurity

Risk factors, classification and natural history of ROP:

ROP starts within a few weeks of birth and can progress rapidly over the following few weeks or regress spontaneously. The international classification describes 5 stages, 3 zones and plus disease tortuosity and dilation of retinal blood vessels. Risk factors for ROP include increasing prematurity, intrauterine fetal growth restriction and a range of postnatal risk factors including hyperoxia and fluctuating hypo-/hyperoxia, sepsis, failure to gain weight, thrombocytopenia and transfusion with blood products. Infants who are unstable and who develop necrotising enterocolitis and bronchopulmonary dysplasia are particularly at risk. Control of these risk factors requires high quality neonatal care from immediately after birth.

Screening for ROP: Which babies, when, where, how and by whom?:

The purpose of screening for ROP is to detect infants who develop the constellation of signs where there is a significant risk of progression to blinding retinal detachment (i.e., 15% risk, described as Type 1 ROP). Criteria for screening need to vary depending on the population of babies developing Type 1 ROP: In low and middle income countries wider criteria are needed than in high income settings. The standard approach to screening entails examination by an ophthalmologist using an indirect ophthalmoscope; Alternatives include digital imaging with cot-side or remote interpretation of the images. The first screening episode should start by 4 weeks after birth and subsequent screening is determined by the findings. At each screening episode a management decision is needed: Discontinue screening; Screen again and when, or urgent treatment is needed. Screening of inpatients must take place in the neonatal unit; Discharged infants can be examined in the unit or eye department. Findings and the management decision must be documented and communicated.

Treatment of ROP: Indications, current uncertainties and follow up:

Type 1 ROP is the current indication for treatment. Treatment must be delivered within 48-72 hours as the condition can progress rapidly to retinal detachment. Standard treatment is laser photocoagulation to the avascular peripheral retina, which gives good resolution in around 90% of cases. Laser treatment can be repeated if necessary. AntiVEGF agents are being assessed for the treatment of ROP and although they can be effective in the short term, ROP can reoccur many months later. In addition, there are concerns about the ocular and systemic longer term complications of these agents, which are currently only recommended as “rescue” treatment when laser is not possible.

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Biography

Clare Gilbert is an ophthalmologist with a Masters in Epidemiology and an MD in Surgical Retina. She has 28 years experience of research and education in low and middle income countries and co-directs the International Centre for Eye Health, London School of Hygiene & Tropical Medicine. Her research interests are blinding eye diseases of children: She has 300 peer reviewed publications, has written 24 book chapters and has received several awards for her work including from the American Academy of Ophthalmology, the International Council of Ophthalmology, the L'Occitane Foundation and the Royal National Institute for the Blind's Lifetime Achievement Award. Control of visual loss from ROP is a major area of her research and support to policy development and program design and implementation.

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David James Riddell Hutchon

Darlington Memorial Hospital, UK

How do we provide PPV with an intact placental circulation at all modes of birth?

The workshop will start with a presentation of the research evidence for the harm of early cord clamping currently necessary to move the neonate over to a room side resuscitation trolley. The workshop will then explore procedures necessary to provide neonatal resuscitation at the side of the mother with the cord and placental circulation intact, while at the same time meeting all the recommendations of the International Liaison Committee on Neonatal Resuscitation and the World Health Organization/Maternal and Child Health Integrated Program. Delegates will be encouraged and guided within a small team to develop their own procedures which can be applied within their own clinical environment. The role of each member of the team, obstetrician, neonatologist/ANNP and assistants and the position of the mother, neonate during resuscitation is optimized. Monitoring and documentation of the condition of the neonatal heart rate etc achieved while at the same time preventing hypothermia. All the facilities of the standard room side resuscitation trolley can be available. Team practice will be available with manikins.

Biography

David James Riddell Hutchon has 28 years of experience as a Consultant Obstetrician. In 2003, he realized that clamping the umbilical cord quickly after birth severely disrupted neonatal circulation and interfered with transition. He has published and lectured extensively on the subject and co-operating with UK and international colleagues developed equipment and ways of providing neonatal resuscitation at the side of the mother without clamping the cord. He has Co-authored a chapter on neonatal care immediately after birth, co-authored two Cochrane systematic reviews and has organized five international conferences on the subject of mother side neonatal resuscitation.

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Scientific Tracks & Abstracts Day 1

Neonatology 2019 & Pediatrics Surgery 2019





SESSIONS

Neonatal Eye Disorders | Neonatal Respiratory Disorders | Neonatal Nutrition | NICU

Chair: David James Riddell Hutchon, Darlington Memorial Hospital, UK

SESSION INTRODUCTION

- Title:** Risk factors for retinopathy of prematurity – A retrospective 10-years study
Estera Lavinia Decean, Clinical County Emergency Hospital, Romania
 - Title:** Bedside retino-teleophthalmological screening, as an "Off-Label" transport activity.
The Hungarian Model
Lajos Lantos, Neonatal Emergency and Transport Service of the Peter Cerny Foundation,
Hungary
 - Title:** Bubble CPAP in preterm babies with RDS with higher peak pressure
Lata Bhat, Indraprastha Apollo Hospital, India
 - Title:** High-frequency oscillatory ventilation: What is New?
Prashanth Gouda, National University of Science and Technology, Oman
 - Title:** Oesophageal atresia with tracheo-oesophageal fistula: An unusual radiological
presentation
Neaha Patel, Homerton University Hospital, UK
 - Title:** Role of nutrition & stimulation in infant brain development: An evidence based review
Surajeet Kumar Patra, RB Health, India
 - Title:** Transferring preterm infants into an open cot at <1400 grams
Anup Kage, Imperial College Healthcare NHS Trust, UK
 - Title:** A 2-year re-audit in a district general hospital: Antibiotics in early-onset neonatal
infection
Neaha Patel, Whipps Cross Hospital, UK
 - Title:** Antepartum and intrapartum risk factors for neonatal hypoxic – ischemic
encephalopathy: A systematic review with meta-analysis
A. Cristina ROSSI, Ospedale della Murgia, Italy
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Risk factors for retinopathy of prematurity-A retrospective 10-years study

Estera Lavinia Decean, Oana Boantă, Corina Zgârcea, Raluca Dumitra, Ecaterina Olariu, Simona Kovacs and Maria Livia Ognean
Clinical County Emergency Hospital, Romania

Introduction: The leading cause of blindness in children, in developed and developing countries, is retinopathy of prematurity (ROP), characterized by an abnormal proliferation of blood vessels in the retina. The main risk factors are prematurity, low birth weight, oxygen exposure and neonatal illness severity.

Aim: The study aimed to identify the major risk factors for stage three and three plus ROP in the premature infants admitted in the NICU of the County Emergency Clinical Hospital in Sibiu during the last 10 years.

Method: We evaluated the ophthalmological screening for ROP results between 2009 and 2018 and searched for severe ROP cases. We paired each case with a control case with identical GA and similar birth weight (± 100 g) and compared them in order to find specific risk factors. The statistical analysis of demographic characteristics and perinatal pathology was performed using SPSS 10.0 for Windows; p was considered statistically significant at values < 0.05 .

Results: We identified nine cases of severe ROP with gestational ages (GA) from 23 to 29 weeks, meaning an incidence of 2.81%, since 320 infants with GA < 30 weeks were admitted in our unit during the study period. Although the duration of mechanical ventilation, respiratory support and oxygen therapy were longer in preterm infants with severe ROP compared to those without severe ROP matched for GA and birth weight and there were notable differences regarding the Apgar score and the number of transfusions, the single statistically significant correlation that was found was with chronic lung disease ($p = 0.014$, OR 3.14).

Biography

Estera Lavinia Decean has completed her Neonatology training at the Iuliu Hatieganu University of Medicine and Pharmacy from Cluj-Napoca Romania in 2013. She is working as a Neonatologist at the level III maternity of the County Emergency Hospital in Sibiu.

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Bedside retino tele-ophthalmological screening, as an "off-label" transport activity: The Hungarian modelLajos Lantos¹, Erika Maka², Gabor Kovacs¹ and Zsolt Somogyvari^{1,2}¹Neonatal Emergency and Transport Service of the Peter Cerny Foundation, Hungary²Semmelweis University, Hungary

Background: Neonatal Emergency and Transport Service of the Peter Cerny Foundation (NETS-PCA) was founded in 1988 with the primary aim to ensure a special neonatal transport facility. Premature Eye Rescue Program (PCA-PERP) was established in 2008 and it uses wide field digital retinal imaging with remote interpretation (WFDI-TM).

Aim: The aim of our analysis was to demonstrate the feasibility and sustainability of the Program operated by NETS-PCA.

Methods: Premature eye rescue program (PCA-PERP) is based on bedside, non-invasive retinal examination performed by qualified neonatal nurse practitioners using a RetCam Shuttle portable WFDI camera. The images are transferred online and interpreted remotely by an ophthalmologist. To demonstrate the sustainability of the system the total cost of investment and maintenance were analysed over the first five year period and compared to the most recent 2018 data.

Results: Our cost-analysis of the first five years demonstrated that 3722 examinations were performed, saved 92,248 km and 3,633 staff working hours. The net present value was 127,847 Euro at the end of 2014 with a payback period of 4.1 years. In 2018 a total of 1034 screening examinations, 22 on-site laser treatments and post-intervention follow-up examinations were performed, resulted in savings of 10,215 running km and around 48,000 Euro.

Discussion: Advantages of PCA-PREP it can decrease the need for transport (neonatological benefit), the workload of ophthalmologists (health system benefit) and it has got documentation benefit (quality-control, patient follow-up, scientific analysis).

Conclusions: PCA-PREP as bedside ROP screening with telemedicine interpretation, beside clinical benefits, is a cost effective, feasible and sustainable system.

Biography

Lajos Lantos is a Neonatal Consultant of the Neonatal Emergency and Transport Service of the Peter Cerny Foundation, Budapest.

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Bubble CPAP in preterm babies with RDS with higher peak pressure

Lata Bhat

Indraprastha Apollo Hospital, India

The standard of care for respiratory support in neonates with respiratory failure is evolving toward the use of nasal continuous positive airway pressure (n-CPAP), mainly because of its association with lower rates of chronic lung disease (CLD) than invasive ventilation. Bubble nasal-CPAP (Bn-CPAP) has re-emerged as a strategy to address the high failure rates associated with conventional CPAP, still limited published data exists in terms of practical aspects of CPAP and optimal and maximum pressure which can be given. Different studies have quoted peak pressure up to 6 or 7, sometimes up to 8 and FiO₂ 0.4 to 0.6 as cut off before deciding as failure of CPAP and have recommended it's use for mild and moderate RDS only. In the COIN trial, maximum pressure of 8 cm water was used in CPAP group and the failure rate was 46%. CPAP group had higher rate of pneumothorax (9%) than the ventilator group (3%). We conducted an observational study to evaluate effectiveness of early Bn-CPAP as a successful primary approach in managing preterm neonates with RDS. CPAP failure rate was 4.1% overall and it was 14.3% in preterm <28 weeks. Success of Bn-CPAP in severe RDS was 84.6%. Success rate was 85.7% in babies <1 kg weight and it was 95.6% in <1.5 kg wt. babies. Peak pressure of ≥8cm water was given to 21.4% babies in success group out of which none developed pneumothorax. Our complication rate of CLD (mild CLD 2.7%), pneumothorax (2.7%), ROP (2.7%) and IVH (1.3%) was very low. A higher CPAP pressure had statistically significant association with severe RDS (p-value=0.05). It was found to be safe for preterm infants with RDS including <28weeks. A systematic review from Cochrane collaboration also showed that continuous distending airway pressure reduces risk of mortality and doesn't increase risk of pneumothorax.

Biography

Lata Bhat has completed her MRCPCH (UK) in 2003 and has been conferred FRCPCH (London) in 2015. She did fellowship in Neonatology from London in 2005. Prior to that, she did Postgraduation in Pediatrics from Safdarjung hospital in Delhi in 1991. She has about 25 years of experience in neonatology. Currently, she is working as a Senior Consultant Neonatologist in Indraprastha Apollo hospital at Delhi, India which is a popular corporate hospital. She has 21 publications in reputed national and international journals, two research publications in American journal of neonatal biology and she has co-authored five books. Her areas of special interest are use of bubble CPAP in neonates with respiratory failure and follow up of high risk babies. She is the Founder President of foundation for high risk babies and child development and convener of Indian foundation of preterm babies.

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High-frequency oscillatory ventilation: What is new?

Prashanth Gouda

National University of Science and Technology, Oman

High-frequency oscillatory ventilation (HFOV) was developed as a new technique of ventilation technique in late seventies, twenty years after the invention of the first artificial respirator. In this mode of ventilation, tidal volumes are smaller than anatomical dead space and respiratory rate is supra-physiological. Animal models showed that HFOV was able to achieve adequate gas exchange with lower inflation pressure at the alveoli with a relatively constant volume above the functional residual capacity leading to significant mitigation of preterm lung injury in the form of volutrauma, barotrauma and atelectrauma. However, early clinical trials failed to demonstrate consistently, favorable results in terms of pulmonary outcome when compared to standard modes of ventilation. Subsequent emergence of volume guarantee (VG) in combination with HFOV made it possible to play with frequency and tidal volume. The addition of VG setting to the ventilator can help to optimize ventilation (stable carbon dioxide removal) as well as oxygenation. Currently, attempts are being made to determine the highest frequency and the lowest tidal volume according to gestational age and birth weight to define a new lung protection strategy. Indeed HFOV with or without VG is increasingly used in preterm infants with respiratory failure. Current evidence suggests that early HFOV could reduce lung injury in combination with an open lung strategy. Nasal HFOV has come up as the newest mode of high-frequency ventilation in neonates. The latest evidence suggests that following surfactant administration, nasal HFOV could be superior to nasal CPAP in preterm infants with moderate to severe RDS without increase in adverse effects.

Biography

Prashanth Gouda has completed his Graduation in Medicine at Rajiv Gandhi University Bangalore and Postgraduate studies at King George Medical University, Lucknow, India. He has served at several reputed medical institutions and research centers in India including KLE University and PGIMER Chandigarh. Currently, he serves as the Faculty of Pediatrics in College of Medicine and Health Sciences at National University of Science and Technology, Muscat, Oman. He has published more than 40 papers in various journals and has been serving in reputed international pediatrics and neonatology journals as Editorial Board Member and Referee.

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Oesophageal atresia with tracheoesophageal fistula: An unusual radiological presentation

Neaha Patel

Homerton University Hospital, UK

A term male infant was admitted to the local neonatal unit at eighteen hours with respiratory distress and copious white secretions. He was intubated and ventilated; on chest x-ray (CXR) the nasogastric tube (NGT) was seen in the stomach and he was extubated shortly afterwards. Six hours after extubation, he developed respiratory distress and was reintubated. The NGT was re-inserted but appeared coiled on repeat CXR, suggesting oesophageal atresia (OA) with tracheo-oesophageal fistula (TOF). He was transferred to our neonatal unit and had an uncomplicated surgical repair. Revisiting his initial CXR, the NGT can be seen parallel to the endotracheal tube, passing through the TOF into the oesophagus where a kink is seen and onwards into the stomach. Post extubation, the oesophageal pouch appears as a lucency extending from the neck into the upper mediastinum. In OA with distal TOF, an NGT coiled in the oesophageal pouch on CXR is usually diagnostic. Rarely, however, the NGT may enter the stomach via the trachea and fistula, as seen in this case. The key message is that neither an NGT in the stomach nor a positive pH test excludes OA with distal TOF. In H-type fistulae, the NGT would also appear in the stomach. Careful review of the CXR is advised to avoid delaying diagnosis; an NGT travelling alongside the endotracheal tube, or a kink in its course, may act as indicator.

Biography

Neaha Patel has completed her Graduation from the University of Birmingham in 2013 and is currently an ST4 Pediatric Registrar working in the Neonatal Intensive Care Unit at the Homerton University Hospital. She has a keen interest in neonatology and is pursuing her Postgraduate Diploma in Pediatric Infectious Diseases at Oxford University, with a view to develop an interest in neonatal infection. She has published one work in a reputed journal.

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Role of nutrition and stimulation in infant brain development: An evidence based review

Surajeet Kumar Patra
RB Health, India

Genes provide the blueprint for brain development but the environment shapes it. Nutrition in first 1000 days (Maternal nutrition and the child's nutrition in the first two years of life) are crucial factors in a child's neurodevelopment and lifelong mental health. The brain development is influenced by genetics (non-modifiable) and environment-and that there is an early window of opportunity to provide the nourishment, stimulation and security children need for their brains need to develop fully-and to help fulfill their own potential. In gestation and infancy, the brain is an 'energy hog', consuming between 50 and 75 per cent of all the energy absorbed by the body from food, including fats, proteins, vitamins and minerals. Inadequate nutrition, during that period affects the structure and functions of the brain in ways that are difficult to offset later. Although all nutrients are necessary for brain growth, key nutrients that support neurodevelopment include protein, specific fats (e.g LCPUFA), glucose, iron, iodine, zinc, choline, folate, vitamins A, D, B6 and B12. Failure to provide key nutrients during this critical period of brain development may result in lifelong deficits in brain function despite subsequent nutrient repletion. Early stimulation and interaction with parents and caregivers jump start the journey of brain development and a lifetime of learning.

Biography

Surajeet Kumar Patra has completed his MD at Lady Hardinge Medical College, New Delhi and University of Delhi, India. He has published 27 papers in reputed International journals and has participated in more than 15 international and national conferences as a Speaker and also won many awards. Currently, he has been associated with RB Health in Medical Affairs.

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Transferring preterm infants into an open cot at <1400 grams

Anup Kage, Dimitrios Rallis and Catherine Longley
Imperial College Healthcare NHS Trust, UK

Background: There is wide variation between when infants are transferred from an incubator to an open cot in neonatal units.

Objective: To evaluate the practices regarding the timing of transitioning infants into an open cot.

Method: Retrospective cohort study across two neonatal units assessing timing of transition to open cot. The corrected age and weight that infants were transferred into an open cot were collected along with hypothermic episodes, weight gain, mode of feeding at discharge and length of stay.

Results: Totally 185 preterm infants were analysed with mean gestational age 29 ± 2.4 weeks and birth weight 1142 ± 257 g. The mean weight of moving into an open cot was 1368 ± 160 g at a corrected age $33 + 2 \pm 1.8$ weeks. Half of the infants (48%) developed episodes of hypothermia, but none required to return to an incubator. The mean corrected age at discharge was 37 ± 1.7 weeks; 69% of the infants were breastfed. Of the total, 115 infants (62%) were transferred early at a mean weight 1277 ± 95 g compared to 70 infants of standard transfer with a mean weight 1516 ± 132 g. Infants of the early group had higher weight gain, were discharged earlier and had shorter length of stay.

Conclusions: Stable preterm infants can be safely moved to an open cot at <33 weeks and weight <1400 g. Earlier transfer into an open cot was associated with earlier home discharge, shorter length of stay and higher daily weight gain.

Biography

Anup Kage is a Consultant in Neonatology at Imperial College Healthcare, NHS Trust. He specializes in Children's & Adolescent Services.

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A two year re-audit in a district general hospital: Antibiotics in early-onset neonatal infection

Neaha Patel

Homerton University Hospital, UK

Early-onset neonatal infection (<72 hours of birth) can result in significant morbidity and mortality in newborn babies. We conducted an audit in 2016 to assess the compliance at a district general hospital against the NICE CG149 guideline outlining the standards for antibiotics in early-onset of neonatal infection. This was re-audited in 2018 to review whether recommendations implemented had been effective. We collected data retrospectively of fifty babies that had been treated on the postnatal ward for suspected sepsis. The same number of patients were audited in 2016. Babies admitted to the neonatal unit were excluded. Results found that only 52% of babies in 2016 and 54% of babies in 2018 are receiving their first dose of antibiotics within one hour of decision to treat. This is due to the midwives being preoccupied with caring for the mother post-partum and despite this issue being raised at labour ward forum two years ago, no change was seen. The lack of improvement over the past two years was disappointing, and as such has resulted in recommendations to increase the number of transitional care nurses and considering allocating a neonatal nurse to administer antibiotics on labour ward. Another key recommendation is to allow the neonatal doctors to administer the first dose of IV antibiotics at time of cannulation to prevent delay; this is a method that is employed in other hospitals in the trust and is extremely effective. A re-audit will be performed in two years to observe whether an improvement is seen.

Biography

Neaha Patel has completed her Graduation from the University of Birmingham in 2013 and is currently an ST4 Pediatric Registrar working in the Neonatal Intensive Care Unit at the Homerton University Hospital. She has a keen interest in neonatology and is pursuing her Postgraduate Diploma in Pediatric Infectious Diseases at Oxford University, with a view to develop an interest in neonatal infection. She has published one work in a reputed journal.

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Antepartum and intrapartum risk factors for neonatal hypoxic-ischemic encephalopathy: A systematic review with meta-analysis

A Cristina Rossi

Ospedale della Murgia, Italy

The aim of this study is to review literature about the risk factors of neonatal hypoxic ischemic encephalopathy (HIE). A search in PubMed, MEDLINE, Embase, Clinicaltrials.gov and reference lists from 1999 to 2018 was performed. Key words: Neonatal encephalopathy, hypoxic-ischemic encephalopathy, fetal/neonatal brain injury, sentinel event, birth asphyxia, cerebral palsy, neonatal seizure, fetal pH, Apgar score, term delivery, intrapartum/antepartum risk factors. Inclusion criteria: study population composed of neonates who manifested HIE within 28 days from delivery, data reported in proportional rate. Studies were excluded if they did not meet inclusion criteria, included preterm pregnancies, postnatal conditions leading to HIE and/or fetal malformations, focused on a single risk factors, were not in English language. PRISMA guidelines were followed. Inter-studies heterogeneity was assessed and random or fixed models were generated as appropriate. Comparison between neonates with HIE vs. controls was performed by calculating odds ratio and 95% Confidence Interval (OR-95%CI). Differences were significant if 95% CI did not encompass 1. Twelve articles were included. Fetuses with growth restriction (OR: 2.87; 95% CI: 1.77-4.67), non-reassuring cardiotocography (OR: 6.38; 95% CI: 2.56-15.93), emergency cesarean section (OR: 3.69; 95% CI: 2.75-4.96), meconium (OR: 3.76; 95% CI: 2.58-5.46) and chorioamnionitis (OR: 3.46; 95% CI: 2.07-5.79) were at higher risk of developing HIE. Nulliparity, gestational diabetes, hypertension, oligohydramnios, polyhydramnios, male gender, induction of labor, labor augmentation, premature rupture of membrane and vacuum delivery were not significantly different. Neonatal hypoxic ischemic encephalopathy has multifactorial origin and its cause is often undetermined and not preventable.

Biography

A Cristina Rossi has completed her degree in Medicine and Residency in Obstetrics and Gynecology from University of Bari, Italy respectively in 1998 and 2003. She was a Research Fellow at Tampa General Hospital with Dr. Quintero (Tampa, Florida) in 2004. She is a Consultant in Obstetrics and Gynecology at Ospedale della Murgia, ASL Bari, Italy. She has published more than 35 papers in reputed journals and has been serving as Reviewer of indexed journals.

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Birth weight discordance and increased neonatal and infant mortality rates among Japanese zygotic twins

Yoko Imaizumi
Osaka University, Japan

The relationship between birth weight discordance (BWD) and infant mortality rate (IMR) among zygotic twins was analyzed among Japanese population during 1995-2008. 128,236 monozygotic (MZ) and 180,920 dizygotic (DZ) twins were used as denominators to compute IMRs and neonatal mortality rate (NMR) in zygotic twins. Numbers of infant deaths were 1,858 MZ and 1,620 DZ twins and neonatal deaths were 1,522 and 1,329, respectively. Proportions of neonatal deaths among infant deaths were 82% for both zygotic twins. BWD levels were classified into seven groups from <5% to 30% \geq . The lowest IMR was 7.5 per 1000 live births at 5-9% in MZ and 6.7 at <5% in DZ twins. IMRs were significantly higher in MZ than DZ twins except two BWD levels from 5%-9% to 10-14%. The lowest IMR in MZ twins was significantly increased after 10-14%. The lowest IMR in DZ twins was 6.7 at <5% and significantly increased at 10-14% and after 25-29%. The relationship between neonatal mortality rate (NMR) and BWD was analyzed for 1999-2008. NMR was the lowest at 5-9% (6.1) in MZ and at <5% (4.0) in DZ twins. The NMR was significantly higher in MZ than DZ twins except 15-19%. As for MZ twins, the lowest NMR at 5-9% significantly increased after 15-19%. The lowest NMR in DZ twins at <5% was significantly increased with BWD after 10-14%. NMRs in DZ twins were 4.0 at <5% and slowly increased with BWD levels by 25-29% (8.4) and suddenly increased after \geq 30% (24.6).

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