CONFERENCE ABSTRACTS

Award-winning abstracts from the first Paediatric and Child Health Association of Malawi Conference

Theme: *Using a multidisciplinary team approach to improve child health outcomes throughout Malawi*

The Paediatric and Child Health Association of Malawi (PACHA) held its first conference from September 22 to 24 2017 in Lilongwe, Malawi under the theme 'Using a multidisciplinary team approach to improve child health outcomes throughout Malawi.' Four guiding principles of the conference research team were: (1) to link research with practice in low resource settings, (2) bring together members of multiple disciplines to engender a more collaborative care environment for interprofessional pedagogy and practice, (3) facilitate communication between stakeholders at research institutions to identify shared goals in alignment with Malawi's national health research agenda, and (4) set the foundation for an annual conference where findings will inform practice and policy in Malawi. Out of 44 submissions, we selected four award-winning abstracts in paediatric and child health to reflect excellence in discovery or implementation research in Malawi. The four winning abstracts are highlighted below.

Elizabeth Glaser, Paul Pensulo, Pui-Ying Iroh Tam
(PACHA Research Committee)

Neonatal acquisition of Group B Streptococcus in Malawi: a mother and infant cohort

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Background

Group B Streptococcus (GBS) is a leading cause of neonatal invasive disease and death in both developed and developing countries. Malawi has made significant progress towards Millennium Development Goal 4, with a considerable fall in under 5 mortality (currently 79/1000 live births). Unfortunately, neonatal mortality remains largely unchanged over the past decade (~17-22 deaths per 1000 live births annually in Malawi) with approximately one-third of neonatal deaths in country being attributable to severe infection. Group B Streptococcus (GBS also known as Streptococcus agalactiae) is the most common cause of neonatal sepsis and a target for control. In Malawi, GBS incidence in young infants is estimated to be 1.81/1000 live births (95% CI 1.40–2.34) However, we need to better understand the true frequency of infections, the biology of disease in these settings, and, in particular, the relationship between maternal GBS carriage and neonatal invasive disease.

Objective

We hypothesized that contrary to established dogma, African neonatal GBS disease before and after the first week of life is largely due to maternally-derived infection.

Methods: We conducted an unselected cohort study of pregnant women and their infants with active surveillance for neonatal sepsis and meningitis to ascertain those affected by GBS. We also conducted a nested sub-study to collect GBS strains from mother-infant pairs for the first month of life, with weekly swabs of the baby's umbilicus, ears & throat.

Results

Maternal antenatal GBS colonization was 17%. Of these GBS isolates, 20% were serotype Ia; 5% serotype Ib; 1% serotype II; 46% serotype III; 28% serotype V. This mother-infant cohort had better than expected outcomes with lower than anticipated event rates, and lower than anticipated mortality rates. We had no episodes of proven GBS sepsis/meningitis within the cohort and fewer neonatal deaths than the national neonatal mortality rate of 17-22 deaths per 1000 per year. Among the 293 mother/infant dyads recruited to the colonization substudy, 6% of mothers were colonized with GBS (17% were serotype Ia; 61% serotype III; 22% serotype V). We suspect that this lower colonization rate may be due to the peripartum chlorhexidine vaginal cleansing now used widely in Malawi. 8.5% of neonates were colonized at some time during the follow-up period (35% were serotype Ia; 42% serotype III; 19% serotype V; 4% serotype VIII).

Conclusions

Neonatal events were less common than expected. Maternal GBS colonization and serotype distribution is comparable to similar settings in the region. As expected there was mother-to-infant GBS transmission, with evidence of intrapartum transmission in 6 of 14 maternal carriers. However, in 9 non-carrier mothers there was GBS acquisition demonstrated in all 9 babies, suggesting other common sources for early life acquisition.

The Effect of hypothermia on survival for neonates admitted with acute respiratory Illness

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Background

Neonatal hypothermia is a global challenge and is widely associated with increased risks of morbidity and mortality. Preterm infants are at an increased risk of hypothermia as they have a high body surface area to weight ratio, but even the full term newborn often cannot produce sufficient heat to prevent a fall in body temperature, especially on the first day of life.

Objective

To quantify case fatality rates for neonates admitted to central and district hospitals in Malawi for respiratory distress and treated with nasal oxygen and determine the impact of admission temperature and admission weight on survival.

Methods

The data for this analysis were collected at all 28 government district and central hospitals in Malawi. De-identified patient information was collected from standard Ministry of Health Acute Respiratory Illness (ARI) forms for hospitalized neonates presenting with respiratory illness. Admission temperature, admission weight, and month of admission were analyzed to determine incidence rates of hypothermia (admission temperature <36.5°C) and the effect on survival for neonates treated with nasal O_2. Differences in mean admission temperature were compared using a two-sided Student's t-test, and relative risk was calculated with respect to normothermic neonates and stratified by admission temperature, admission weight, and month/season.

Results

Incidence rates of hypothermia increased through the cold and rainy seasons (November-August) and decreased during the hot season (September-October). Although incidence rates of hypothermia were higher for infants with lower admission weights, there was no trend seen to correlate admission weight with season. When stratified by weight, the average admission temperature for neonates who survived to discharge was higher than those who did not, and became statistically significant ($p<0.05$) amongst neonates with higher admission weights. When stratified by month, the average admission temperature of neonates who survived to discharge was always significantly higher than those who did not. Relative risk analyses showed that neonates with extreme hypothermia (<32°C) had a risk of mortality nearly 4 times higher than those that were normothermic (36.5°C-37.5°C). Furthermore, extremely low admission weight neonates who were also extremely hypothermic (<1000g, <32°C) had a risk of mortality nearly 7 times higher than those who were normothermic with an admission weight >2500g.

Conclusion

Hypothermia upon admission is a pervasive problem affecting neonates in respiratory distress.

Strengthening practices that reduce hypothermia at birth: A case at Queen Elizabeth Central Hospital (QECH), Blantyre, Malawi

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Background

Hypothermia at birth contributes to neonatal morbidity and mortality in developing countries yet is a neglected aspect of care. At Queen Elizabeth Central Hospital (QECH), the largest health facility in Malawi, 47 % of neonates admitted during the first two months of 2016 had temperatures below 36°C, meeting criteria for hypothermia. Factors contributing to low neonatal temperature included: inadequate drying at birth, inappropriate warming practices, lack of adequate clothing and linens available at birth facilities, and a dearth of training for staff and mothers on the risks of and ways to prevent hypothermia.

Objective

To reduce cases of hypothermia in neonates born at QECH via a practice improvement initiative in the labour ward focusing on thermal protection at birth.

Methods: We conducted trainings of nurse midwives and support staff to reinforce thermal protection practices at birth, which included immediate drying, use of receiving towels, hats, bed sheets, and skin-to-skin contact for 1 hour after delivery. Information was disseminated through posters developed to share best practices on reducing hypothermia and through incorporating hypothermia prevention into antenatal lessons.

Results and discussion

At baseline, the first two months of 2016, 47% of neonates admitted to the unit met the criteria for hypothermia, i.e. temperatures below 36oC. Following training and resource mobilization, cases of hypothermia decreased to 27.9% of admitted neonates in December 2016, 26% in January 2017, and 18.9 % in February 2017. This was a decline of 59% over a 12 month period. Only 5.9% of infants born at QECH between December 2016 and February 2017 were admitted to the neonatal unit with temperatures between 32-34.9oC (moderate to extreme hypothermia), as compared to 30% of those referred from other facilities.

Conclusions

Through training and resources mobilization, improved practices at birth were observed, including thorough drying, routine practices of skin-to-skin contact for stable neonates, and availability and use of receiving towels, hats, and posters in the labour ward.

Leadership skills and mentorship are vital if quality care is to be achieved. There is a need to roll out the project to referring health centres to determine if the practices strengthened in this project will assist in improving the overall survival rates of neonates.

Treating brain swelling in paediatric cerebral malaria

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Background

Malaria remains a major cause of morbidity and mortality claiming more than 750,000 lives each year. Cerebral malaria (CM) is a severe complication characterized by coma and seizures with Plasmodium falciparum as the specific primary cause of severe disease worldwide. The case fatality rate of CM is 15-50% with an annual incidence ranging from 1-12 cases per 1,000 children in malaria-endemic regions and 85% of the morbidity and mortality occurring in young African children. Ongoing malaria studies in Malawi suggest that children with retinopathy-positive CM and increased brain volume have an increased likelihood of mortality, with death occurring due to respiratory arrest secondary to intracranial hypertension. Although children with increased brain volume due to CM are at increased risk of death, the majority recover quickly and completely, suggesting that the adverse effects of the condition on respiratory status are reversible and short-lived hence this clinical trial.

Objectives

(Primary) 1. Evaluate adjunct therapy targeting CM children with increased brain volume. 2. Compare final outcomes in pediatric CM patients receiving usual care (raising the head of the bed at 30 degrees and anti- malarial treatment) with both of the two interventions (usual care + immediate ventilation or usual care + hypertonic saline). (Secondary) Compare rates of adverse neurological outcomes in those assigned to two interventions and those assigned to usual care among survivors.

Methods

Study Design: This is a prospective, randomized, controlled non-blinded clinical trial of two adjunctive therapeutic approaches in treating increased brain volume. Study Population: Malawian children, aged 6 months to 8 years, with cerebral malaria, known malarial retinopathy status and Magnetic Resonance Imaging (MRI) evidence of severely increased brain volume. Total of 195 children, 65 randomised to each arm. Study Duration: Six years participant accrual; one year data analysis. Study Site: Paediatric Research Ward and Paediatric Intensive Care Unit, Queen Elizabeth Central Hospital, Blantyre Malawi. Collection Method: Data will be collected by study clinicians using standardised neurologic observations: The Malawi Developmental Assessment Tool (MDAT) for participants up to the age of 35 months, the Kaufman Assessment Battery for Children, Version II (KABC-II), for participants > 35 months, and Glasgow Outcome Scale (GOS). Analysis: ANOVA, nonparametric, and chi-square tests.

Expected outcomes

Primary outcome: Treatment success or failure (a composite of death, ventilatory rescue, and brain death) determined within 7 days of entry. Secondary outcome: Neurological sequelae in survivors assessed on follow-up using MDAT, KABC II and GOS.