**Supplementary Table 1: Risk Factors for and Symptoms of Neonatal Sepsis as per Iliff[1]**

|  |  |
| --- | --- |
| **Maternal Risk Factors\*** | Prolonged Rupture of Membranes (PROM)> 24 hours |
|  | Preterm labour (≤36 weeks) |
|  | Maternal pyrexia > 38°C for > 2 hours |
|  | Prolonged labour > 24 hours especially with ruptured membranes |
|  | History of chorioamnionitis |
|  | Maternal urinary tract infection (UTI) within 7 days of delivery |
|  | Group B Streptococcus carriage in the mother (on high vaginal swab) |
|  | Mother presently on antibiotics for sepsis |
|  | Culture proven infection in mother (blood/urine) done in labour or < 24 hours post delivery |
| **Infant Risk Factors\*** | Born before arrival |
|  | Dumped babies |
| **Symptomatic features in infant\*** |  |
| General | Poor suck |
|  | Vomiting |
|  | Irritable |
|  | Weak cry |
|  | Lethargy |
|  | Unstable temperature |
|  | Jaundice |
|  | Infection in twin |
| Respiratory | Respiratory distress |
|  | Apnoea |
|  | Cyanosis |
| Neurological | Seizures |
|  | Jitteriness |
|  | Bulging fontanelle |
|  | Reduced tone |
|  | Abnormal primitive reflexes |
| Abdomen | Distension |
|  | Umbilical flare |
| Cardiovascular | Tachy/bradycardia |

\*Babies with one risk factor and no symptoms to be observed for 24 hours on the neonatal unit. Symptomatic babies or babies with 2 or more risk factors to be managed as suspected sepsis. Investigations to include a full blood count, C-reactive protein, blood culture prior to commencement of antibiotics.

References

[1] Iliff PB, C.; Chimhini, G.; Chimhuya, S.; Chitsike, I.; Kandawasvika, G.; Mujuru, H.; Nathoo, K.; Powell, G., Stranix, L.; Ticklay, I. *Peter Iliff’s Harare Hospital Neonatal Handbook,* 2nd edn.: Health Partners International of Canada 2013.

**Supplementary Table 2: Antimicrobials prescribed at admission for 650 babies admitted to Harare Central Neonatal Unit at initial and repeat audit.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Antibiotics at admission | Initial audit (n) | Percentage | Repeat audit (n) | Percentage | P value (fishers exact test) |
| Benzyl penicillin | 298 | 65% | 92 | 51% | 0.0001 |
| Gentamicin | 307 | 67% | 92 | 51% | <0.0001 |
| Amoxicillin | 100 | 22% | 0 | 0% | <0.0001 |
| Ampicillin | 16 | 3% | 0 | 0% | 0.005 |
| Cloxacillin | 1 | 0.2% | 0 | 0% | 1.00 |
| Ceftriaxone | 41 | 9% | 3 | 2% | 0.0004 |
| Procaine pencillin | 1 | 0.2% | 1 | 0.5% | 0.50 |
| Metronidazole | 14 | 3% | 1 | 0.5% | 0.08 |
| Ciprofloxacin | 1 | 0.2% | 0 | 0% | 1.00 |

**Supplementary Table 3**

Days of Therapy/1000 patient days for specific antibiotic at first and repeat audit

|  |  |  |
| --- | --- | --- |
| Antibiotic | DOT first audit | DOT repeat audit |
| Amoxicillin | 148 | 0 |
| Ampicillin | 20 | 0 |
| Benzylpenicillin | 418 | 505 |
| Ceftriaxone | 154 | 45 |
| Chloramphenicol | 0 | 11 |
| Ciprofloxacin | 4 | 0 |
| Cloxacillin | 12 | 0 |
| Gentamicin | 416 | 505 |
| Imipenem | 16 | 0 |
| Metronidazole | 48 | 14 |
| Procaine penicillin | 5 | 2 |
| Tetracycline | 0 | 8 |
| Vancomycin | 3 | 23 |

**Supplementary Table 4**

**Table of seven blood culture results received in time to alter therapy (before the baby had already been discharged or died).**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Organism | Days to results | Sensitive | Resistant | Action taken | Outcome |
| *Klebsiella pneumoniae* | 4 | imipenem | All others | Imipenem started on day of receipt (6 days) | Started again after a week interruption |
| Non-lactose fermenting coliform | 4 | Imipenem | Ceftazidime | Changed from ceftriaxone🡪Amoxicillin on day of culture | Home day of result |
| Lactose-fermenting coliform | 6 | Imipenem | Ceftazidime | Ceftriaxone & Metronidazole continued | Died 3 days later |
| *Klebsiella pneumoniae* | 4 | Imipenem, ciprofloxacin | Ceftriaxone | Changed from metro monotherapy to imipenem after a week | Treated for 14 days although late |
| *Klebsiella pneumoniae* | 5 | Imipenem  ciprofloxacin | Ceftriaxone | Changed on day of result to imipenem | 14 days of treatment. Survived |
| *Staphylococcus aureus* | 5 | Ceftriaxone | Clindamycin | On Ceftriaxone for a week when culture taken | Discharged on oral amoxicillin |
| *Klebsiella pneumoniae* | 5 | Imipenem | All others | Already on empiric imipenem | Died 3 days after culture result |

**Supplementary Results and Discussion**

**Blood Culture Results**

In the primary audit, only 33% of blood cultures sent had results received filed in the patient notes. This is likely due to the delays first in processing the cultures, then the cumbersome method of interns having to pick up results from the laboratory in person and then file them. The rapid turnover of patients meant that it was often difficult for interns to match a result to a set of notes, especially as the patient might have already been discharged or died. This in turn led to many results not being filed with patient notes at all. Improving the timely feedback of blood culture results between laboratory and neonatal unit is a key aim of the NeoTree project, which has an additional laboratory arm to streamline and improve accuracy of blood culture result feedback.

**Supplementary Figure 1 Legend: Blood culture results at admission and subsequent episodes of sepsis**

CONS: coagulase-negative staphylococcus

E\_coli: *Escherichia coli*

GAS: Group A streptococcus

GDS: Group D streptococcus

Klebsiella: *Klebsiella pneumoniae*

LFC: lactose fermenting coliforms

NLFC: non-lactose fermenting coliforms

S\_aureus: *Staphylococcus aureus*