SUPPLEMENTARY MATERIALS

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Supplementary table 1. Criteria used for the diagnosis of neonatal sepsis (adapted from the NICE guidelines)[1]

MAJOR CRITERIA (start antibiotics if any of these are present)	
Confirmed sepsis or chorioamnionitis in mother Confirmed or suspected sepsis in twin Seizures Severe respiratory distress in a term infant Respiratory distress starting more than 4h after birth Signs of shock	
MINOR CRITERIA (start antibiotics if any two available)	
Antenatal	Rupture of membranes >18h Spontaneous preterm birth <37/40 weeks GBS sepsis in previous baby or documented GBS carriage in this pregnancy (urine or vaginal swab)
Natal	Born before arrival Meconium stained liquor
Postnatal	Respiratory distress that is not obviously related to: • Environmental hypothermia • "Delayed transition to extra-uterine life" i.e. mild to moderate respiratory distress apparent soon after birth that is improving with time. Hypoxia Apnoea Hypoglycaemia/ hyperglycaemia not otherwise explained Temperature instability not explained by environmental factors Acidosis not obviously related to HIE Unexplained bleeding or thrombocytopenia Mild encephalopathy/ altered responsiveness Altered tone not otherwise explained Feed intolerance/ feeding difficulty Abnormal heart rate (<90 or >160/min) Jaundice in first 24h

GBS: group B streptococcus; HIE: hypoxic-ischemic encephalopathy.

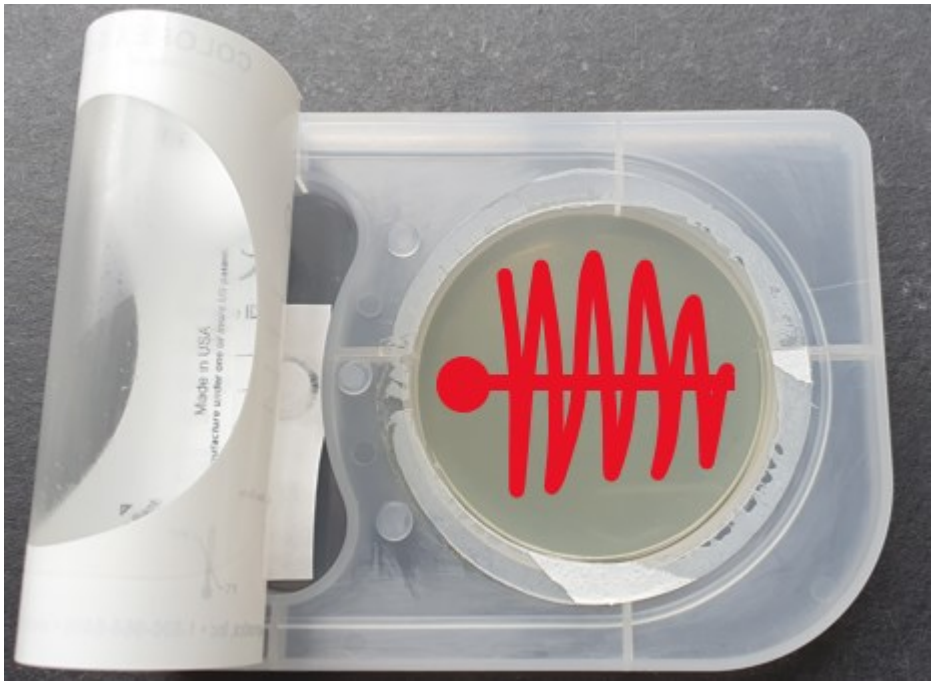
1. National Institute for Healthcare Excellence (NICE). Neonatal infection (early onset): antibiotics for prevention and treatment. Clinical guideline (August 2012). NICE, UK. Available from https://www.nice.org.uk/guidance/cg149. .
2. The European Committee on Antimicrobial Susceptibility Testing. Breakpoint tables for interpretation of MICs and zone diameters. Version 10.0, 2020. http://www.eucast.org.

Supplementary table 2. Bacterial identification and antimicrobial susceptibility testing according to pathogen

Gram-stain result	Drugs tests for AST[#]	Other tests for identification
Gram positive cocci (clusters)	Cefoxitin, vancomycin	Catalase, coagulase
Gram positive cocci (chains)	Ampicillin, vancomycin	Catalase, bile-aesculin
Gram negative bacilli	Ceftriaxone, imipenem, ciprofloxacin, chloramphenicol, gentamicin, amikacin	API 20E*

All positive blood cultures were plated on blood, chocolate and MacConkey agar.
**API 20E results were interpreted using the API 20E version 5.0 database.*
[#]Internal quality control for AST was conducted and interpreted in accordance to EUCAST recommendations (Routine and extended internal quality control for MIC determination and disk diffusion as recommended by EUCAST Version 10.0, valid from 2020-01-01, www.eucast.org)
AST: antimicrobial susceptibility testing

Supplementary figure 1. Inoculation technique for the InTrays. (one drop of blood from the positive blood culture is inoculated and streaked on the plate).



Risk factor analysis for isolation of *K. pneumoniae* from blood cultures

Characteristics between neonates with *K. pneumoniae* sepsis and those where the pathogen was not isolated were compared. Differences between groups were assessed using the $\chi 2$ test for categorical and the Mann-Whitney U test for continuous variables. The level of significance was considered at $p \leq 0.05$. For the risk factor analysis, the outcome was isolation of *K. pneumoniae* from the blood culture. Multivariable analysis using logistic regression was performed for variables which showed an association in the bivariate analysis at a p-value of <0.20.

Infections with *K. pneumoniae* were more frequent in neonates where the blood culture was collected within 72 hours of birth 38/75 (50.7%) compared with those who had blood cultures done more than 72 hours after birth 16/124 (12.9%, p<0.001). Among the baseline characteristics, low or very low birth weight and age of sepsis onset, were associated with *K. pneumoniae* infection (Supplementary Table S4) in the bivariate analysis and after adjustment. Neonates with a low or very low birth weight had an adjusted OR for *K. pneumoniae* infection of 4.5 (95% CI 1.95-10.21, p<0.001).

Supplementary table 4. Risk factors for *Klebsiella pneumoniae* infections

Characteristic	Odds ratio	95% CI	p-value	Adjusted Odds Ratio	95% CI	p-value
Maternal age	1.003	0.96-1.05	0.895			
Number of ANC visits	0.933	0.77-1.13	0.480			
Mother is HIV+	1.776	0.69-4.57	0.233			
Primigravida	1.188	0.64-2.21	0.587			
Birth outside a healthcare facility	2.143	0.87-5.28	0.097			
Outborn*	2.198	1.15-4.18	0.016	2.086	1.02-4.25	0.043
Prolonged rupture of membranes	0.780	0.24-2.54	0.680			
Caesarean delivery	1.053	0.50-2.21	0.891			
Female sex	0.548	0.29-1.02	0.059	0.669	0.33-1.35	0.261
Low or very low birth weight	5.397	2.47-11.78	<0.001	4.459	1.95-10.21	<0.001
1-minute Apgar score	1.033	0.89-1.20	0.676			
5-minute Apgar score	1.023	0.86-1.22	0.803			
Required oxygen or respiratory support	1.319	0.71-2.46	0.384			
Difficulties feeding	4.765	1.79-12.66	0.002			
Required surgery	1.871	0.43-8.10	0.402			
Age at blood culture collection	1.093	1.03-1.16	0.005	1.081	1.00-1.17	0.055
Length of hospital stay in days	1.03	1.00-106	0.025	1.008	0.97-1.05	0.696

*Respiratory support = need for supplemental oxygen, CPAP or invasive ventilation. *Outborn: born outside Harare Hospital. Difficulties feeding was not included in the multivariable analysis as it is strongly correlated to birth weight. Birth outside a healthcare facility was not included in the multivariable analysis.*

Outcomes of neonates with ESBL-*K. pneumoniae* sepsis

Supplementary figure 4. Survival analysis for neonates with and without *K. pneumoniae* sepsis