

Impact of neonatal sepsis calculator in West Midlands (UK)

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Archives of Disease in Childhood

Impact of Neonatal Sepsis Calculator in West Midlands (UK)

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Dear Editor,

The Kaiser Permanente Sepsis Risk Calculator (KP-SRC) was developed to predict early onset neonatal sepsis (EOS), using continuous variables (local EOS incidence rates, maternal factors, infant well-being) to guide decision making.[1]

KP-SRC has been adopted in Plymouth and Wales, reducing antibiotic use by up to 84%[2,3] compared with using National Institute of Clinical Excellence (NICE) guidelines. This may reduce antibiotic resistance, dysbiosis,[2] invasive procedures, and mother-baby separation, although some safety concerns have been raised.[4]

We performed a virtual application of the KP-SRC versus NICE guidance on postnatal antibiotic usage and length of stay, using anonymised clinical data collected prospectively across 11 neonatal units in the West Midlands, UK. The HRA confirmed ethical approval was not required.

All infants born ≥ 34 weeks gestation between 1st January 2020 and 29th February 2020 who were commenced on antibiotics for EOS and managed as per NICE guidelines were included. Those admitted to the neonatal unit prior to commencing antibiotics were excluded.

The KP-SRC was applied retrospectively, using two EOS incidence rates - 1/1000 and 2/1000 live births (West Midlands rate varies between 0.7-1.3/1000). KP-SRC recommendations were analysed against evidence of EOS.

Data from 626 infants were collected and 599 were included for analysis. (Figure 1)

KP-SRC would have led to antibiotic use in only 118 infants at an incidence of 2/1000 and 71 at 1/1000; a reduction of 80% and 88% respectively. If those recommended blood cultures only by KP-SRC were also treated, the reduction would be 49% and 72% respectively.

3/599 (0.5%) infants had positive blood cultures. One infant had GBS bacteraemia (CRP 28) and would have been recommended antibiotics using KP-SRC. Two infants had E. coli bacteraemia: one recommended observations by KP-SRC (CRP 37); the other recommended culture at 2/1000 and observations at 1/1000 (CRP 88). Due to persistent pyrexia, both would likely have commenced antibiotics subsequently under KP-SRC observations. All CSF cultures were negative.

27 (5%) infants had CRP levels >60 , including one of the babies with E. coli bacteraemia; 7 (26%) infants with CRP >60 would be recommended observations only, even using KP-SRC at 2/1000.

No infants received mechanical ventilation or inotropes, and there were no deaths.

Current antibiotic use using NICE guidance led to a mean treatment length of 68.0 hours (median 48 hours). This could be reduced by up to 38% at 1/1000 and 35% at 2/1000 KP-SRC if only babies recommended antibiotics were treated, and all other babies observed for 36 hours. If babies recommended either antibiotics or culture were treated, then reductions would be 30% at 1/1000 and 18% at 2/1000.

As reported by others, we conclude that implementation of KP-SRC could reduce antibiotic exposure in 49-88% of infants with a reduction in hospital stay by 18-38%.

However, a small group of infants initially recommended observations by KP-SRC, can have high CRP or bacteraemia. Therefore, emphasis on close observation, early recognition of deterioration and timely escalation is vitally important.

Further research is required to examine the safety of KP-SRC in the UK setting.

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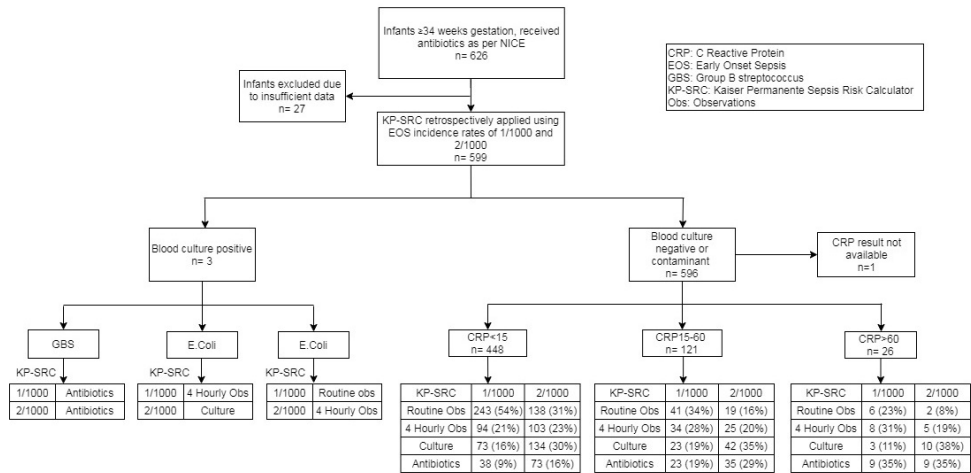


Figure 1: Retrospective Virtual Application of KP-SRC to Infants Receiving Antibiotics as per NICE EOS guidelines

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