Impact of the new NICE guidance 2021 on management of early onset neonatal sepsis

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In April 2021 the National Institute for Health Care Excellence (NICE) published new guidelines for neonatal infection,[1] replacing the 2012 guidance. In order to reduce antibiotic usage in healthy infants, NICE modified risk factors and allowed use of Kaiser Permanente Sepsis Risk Calculator (KP-SRC)[2] as an alternative with prospective audit. KP-SRC provides recommendations for antibiotics, culture with observation or observation only. Previous studies[3], including from our group[4], demonstrated significant reductions (up to 84%) in antibiotic usage on virtual application of KP-SRC compared to NICE 2012. No studies examining the impact of NICE 2021, or its effect in conjunction with KP-SRC, have yet been published.

We performed a retrospective application of NICE 2021 using data collected from 11 neonatal units in the West Midlands, UK. We included all infants born ≥34 weeks' gestation between 1 January 2020 and 29 February 2020, not directly admitted to NNU, commenced on antibiotics following NICE 2012. KP-SRC was also retrospectively applied (EOS incidence rate 2/1000; regional rates vary from 0.7-1.3/1000).

Figure 1: Retrospective virtual application of NICE Guidelines for Neonatal Infection 2021, compared to KP-SRC and previous NICE Guidelines 2012

Data from 626 infants was collected and 572 were included for analysis (Figure 1). NICE 2012 recommended antibiotics in 95.5% (of the 626), therefore 4.5% may have had unnecessary treatment. NICE 2021 reduced antibiotic usage by 39.5% compared to appropriate application of NICE 2012. When KP-SRC was additionally applied there was an overall reduction from NICE 2012 of 82%. If those recommended cultures by KP-SRC also received antibiotics, as recommended by regional guidelines, the overall reduction from NICE 2012 would be 63.5%.

Table 1: Estimated percentages of live births >34 weeks receiving antibiotics in postnatal settings, following virtual application of NICE 2021 guidelines and KP-SRC.

	Live births Total Jan-Feb 2020	Current practice Abx	NICE 2012 Applied*	KP-SRC 2/1000 Abx indicated plus NICE 2012*	KP-SRC 2/1000 Abx and Culture indicated plus NICE 2012*	NICE 2021*	KP-SRC 2/1000 Abx indicated plus NICE 2021*	KP-SRC 2/1000 Abx and Culture indicated plus NICE 2021*
n	7833	624	572	118	306	346	103	209
%		8.0	7.3	1.5	3.9	4.4	1.3	2.7

*Analysis of 599 infants with complete data
Abx: Antibiotics
NICE 2012: Neonatal infection (early onset): antibiotics for prevention and treatment, Clinical guideline [CG149] 2012
KP-SRC: Kaiser Permanente Sepsis Risk Calculator
NICE 2021: Neonatal infection: antibiotics for prevention and treatment NICE guideline [NG195] 2021

At baseline, 7.3% of live births >34 weeks in postnatal settings were recommended antibiotics using NICE 2012 (Table 1). NICE 2021 may reduce this to 4.4% and KP-SRC may reduce it to 2.7%,,treating those recommended both culture and antibiotics.

Three infants had a positive blood culture (0.5%), all were recommended antibiotics using both NICE 2012 and 2021. One had Group B Streptococcus bacteraemia (CRP 28), KP-SRC recommended antibiotics. Two infants had Escherichia coli bacteraemia; both were pyrexial. One with CRP 88, KP-SRC recommended culture and one with CRP 37 KP-SRC recommended observations. As symptomatic, it is likely that these infants would receive antibiotics under whichever system used. All cerebrospinal fluid cultures were negative. No infants received mechanical ventilation or inotropes, and there were no deaths.

Of the 26 (4.5%) infants with CRP>60, NICE 2021 recommended antibiotics in 18 and KP-SRC recommended antibiotics in 9, culture in 11 and observations in the rest (6).

We conclude that NICE 2021 may reduce antibiotic exposure in infants on the postnatal ward by up to 39.5%. Subsequent implementation of KP-SRC to those infants could reduce antibiotic exposure by up to 63.5%–82%. In clinical practice,, some infants on KP-SRC observations may later become symptomatic needing treatment and therefore the reduction may be slightly less. A prospective audit with KP-SRC as recommended by NICE would be beneficial in reviewing the safety and efficacy of KP-SRC.

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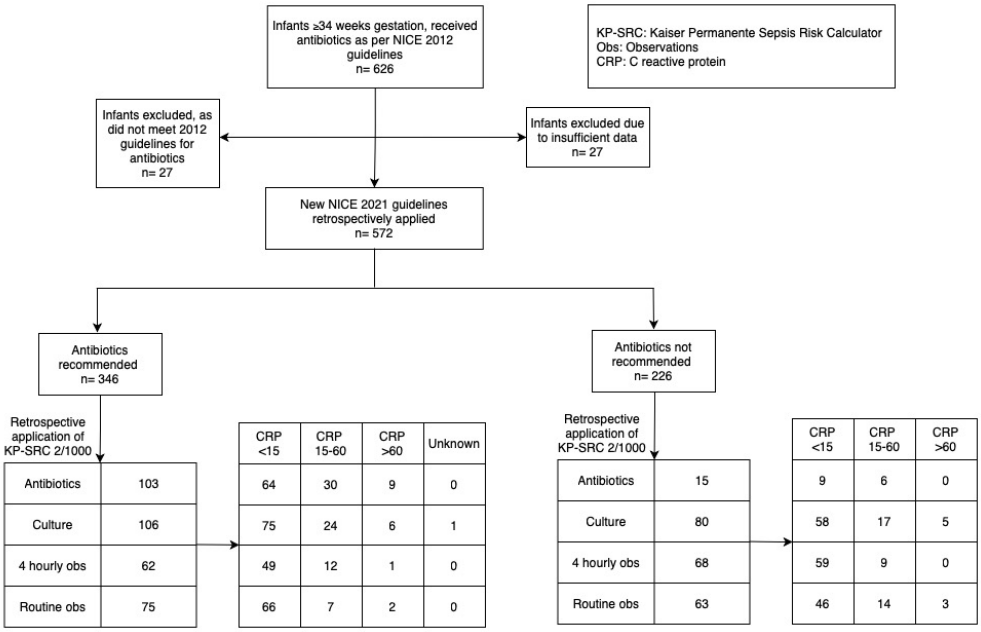

		CRP <15	CRP 15-60	CRP >60	Unknown
Antibiotics	103	64	30	9	0
Culture	106	75	24	6	1
4 hourly obs	62	49	12	1	0
Routine obs	75	66	7	2	0

		CRP <15	CRP 15-60	CRP >60
Antibiotics	15	9	6	0
Culture	80	58	17	5
4 hourly obs	68	59	9	0
Routine obs	63	46	14	3

Figure 1: Retrospective virtual application of NICE Guidelines for Neonatal Infection 2021, compared to KP-SRC and previous NICE Guidelines 2012

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