Impact of Respiratory Viral Infections and SARS-CoV-2 on the Management and Outcomes of Febrile Infants

as part of the Febrile Infants Regional Evaluation (FIRE) project

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Introduction

10-20% of febrile infants have a serious bacterial infection (SBI) (2) and differentiating SBI from self-limiting illnesses is challenging. Rapid viral testing is increasingly available in paediatric practice, raising the question of the influence of viral respiratory infection or SARS-CoV-2 on the management and outcome of febrile infants.

Methods

This was a retrospective, multi-centre, observational study conducted at 21 London hospitals within the REACH Network (1).

Inclusion criteria: Infants <90 days with a measured or caregiver reported fever ≥38℃, presenting to hospital between 2021- 2022.

Variables collected: investigations, hospital admission, administration of IV antibiotics and diagnosis

SBI is defined as: bacteraemia (positive, non-contaminant blood culture), meningitis (positive, non-contaminant CSF culture) or UTI (positive single-organism urine culture >100,000 CFU/ml).

Statistical analysis was conducted using SPSS and the variables described were compared between positive and negative NPA/SARS-CoV-2 results using Chi-square tests.

Table 1: Comparison of investigations, management and outcomes of NPA and SARS-CoV- positive and negative febrile infants

	NPA result			SARS-CoV-2 result		
	Positive	Negative	*p*	Positive	Negative	*p*
Investigations						
Full blood count	422/456 (92.5%)	398/415 (95.9%)	**.035**	295/320 (92.2%)	778/821 (94.8%)	.099
Blood culture	378/456 (82.9%)	356/415 (88.0%)	**.035**	248/320 (77.5%)	699/821 (85.1%)	**.002**
CSF culture	258/456 (56.6%)	271/415 (65.3%)	**.008**	136/320 (42.5%)	486/821 (59.2%)	**<.001**
Urine dip or culture	355/456 (77.9%)	340/415 81.9%	**.135**	222/320 (69.4%)	675/821 (82.2%)	**<.001**
Chest x-ray	109/456 (23.9%)	68/415 (16.4%)	**.006**	30/320 (9.4%)	151/821 (18.4%)	**<.001**
Management						
Inpatient admission	386/456 (84.6%)	374/415 (90.1%)	**.016**	257/320 (80.3%)	725/821 (88.3%)	**<.001**
IV antibiotics	351/456 (77.0%)	334/415 (80.5%)	.207	215/320 (67.2%)	644/821 (78.4%)	**<.001**
Outcomes						
SBI	36/456 (7.9%)	62/415 (14.9%)	**.001**	16/320 (5.0%)	109/712 (13.3%)	**<.001**

Results

2008 infants included in the study were included in the study. 44% underwent nasopharyngeal aspirate (NPA) testing for viral infections, of whom 52% were positive. 62% of infants were tested for SARS-CoV-2, of whom 30% were positive. Infants who tested positive for a respiratory virus on NPA or for SARS-CoV-2 were less likely to undergo blood culture, CSF culture and urine testing than those who were negative (table 1). Chest x-ray was more likely to be performed in those who had a positive NPA but was less likely to be performed in those who were positive for SARS-CoV-2 (table 1). Those who tested positive for either were less likely to be admitted to hospital or have a SBI (table 1). Additionally, infants with a positive SARS-CoV-2 test were less likely to receive IV antibiotics.

Conclusion

The presence of positive NPAs or SARS-CoV-2 swabs is associated with reduced investigation, inpatient admission and IV antibiotic use in febrile infants aged <90 days, despite their lack of inclusion in national clinical practice guidelines. Although in our cohort a positive respiratory virus test was associated with reduced odds of SBI, it is important that co-existent SBIs are not missed. The incorporation of rapid viral testing in clinical practice guidelines should be considered.

References

1 Loucaides E et al 2025 Research exposure in UK paediatric training: how do we address the gaps- experience from the London Research, Evaluation, Audit for Child Health (REACH) network. Archives of Disease in Childhood 110 (4) 256-264.

2. Kuppermann, N., et al 2019 A Clinical Prediction Rule to identify febrile infants 60 days and younger at low risk of serious bacterial infections JAMA Paediatrics 173(4), 342

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