Clinical presentation and outcome of acute respiratory illnesses in South African children during the COVID-19 pandemic

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Introduction:

It is unknown if African children with acute respiratory tract infections (ARIs) caused by SARS-CoV-2 have higher morbidity and mortality. We investigated the presentation and outcomes of ARIs in children with real-time polymerase chain reaction (rt-PCR) confirmed SARS-CoV-2 compared with those who had a negative SARS-CoV-2 rt-PCR.

Methods:

Cross-sectional study of children aged 0-13 years old admitted with an ARI from May 5, 2020, to December 5, 2020, at Tygerberg Hospital in Cape Town, South Africa.

We collected data on clinical presentation, disease severity and outcomes and included results of routinely collected respiratory virus testing if performed.

- Chest radiographs (CXR) were reviewed by 2 blinded external experts.
- Upper respiratory tract infection (URTI) was defined as respiratory symptoms without tachypnoea/respiratory distress.
- Lower respiratory tract infection (LRTI) was defined as respiratory symptoms with tachypnea and/or respiratory distress.

We excluded infants in the neonatal wards. Univariate and multivariable analyses were performed.

TABLE - Patient characteristics

	SARS-CoV-2 Pos	SARS-CoV-2 Neg	P-value
N	38	138	
Age* (Months)	6.6 (2.1-23.7)	17.0 (4.6-42.0)	0.03
Age <1 year)	25 (63%)	56 (41%)	0.01
Female	21 (55%)	53 (38%)	0.06
Weight-for-age Z score (WAZ)*	-0.83 (-2.5 - -0.11)	-0.54 (-1.6 - -0.44)	0.03
Comorbidity	10 (26%)	43 (31%)	0.56
Wheeze	12 (33%)	71 (51%)	0.03
C-reactive protein*	14 (2-25)	10 (2-37)	0.93
White cell count*	12.7 (10.4-19.0)	11.9 (7.7-16.6)	0.33
CXR Alveolar changes	18 (48.6%)	39 (31.2%)	0.06
Low flow oxygen	27 (68%)	94 (68%)	0.73
High-flow or CPAP or IPPV	15 (38%)	36 (26%)	0.11
ICU admission	7 (18%)	9 (7%)	0.03
Oxygen duration (days)*	6 (1.0-9.2)	2 (1.0-4.5)	0.01
Length of stay*	7.0 (2.0-15.0)	3.0 (2.0-8.0)	0.01
Viruses other than SARS-CoV-2 found[$]	15/27 (55.5%)	56/81 (69.1%)	0.20
Human Rhinovirus (HRV)	9(33.3%)	47(58.0%)	0.03
RSV A/B	30(27.8%)	24(29.6%)	0.46
Adenovirus	5(18.5%)	5(6.2%)	0.06

* Median and interquartile ranges
[a] This includes children with current TB disease (7), HIV infected (9), asthma (7), cardiac (5), oncological (6), cerebral palsy (4). Selected other conditions included one child with diabetes and two children with sickle cell disease.
[$] Multiplex PCR testing for respiratory viral panel was only performed in 108 children.

Results:

176 children were included; 38 (21.6%) SARS-CoV-2 rt-PCR positive (Table 1).
LRTI was diagnosed in 31 (80%) of SARS-CoV-2 positive children and 102 (74%) of negative children (p=0.43).

There were no SARS-CoV-2 related deaths.

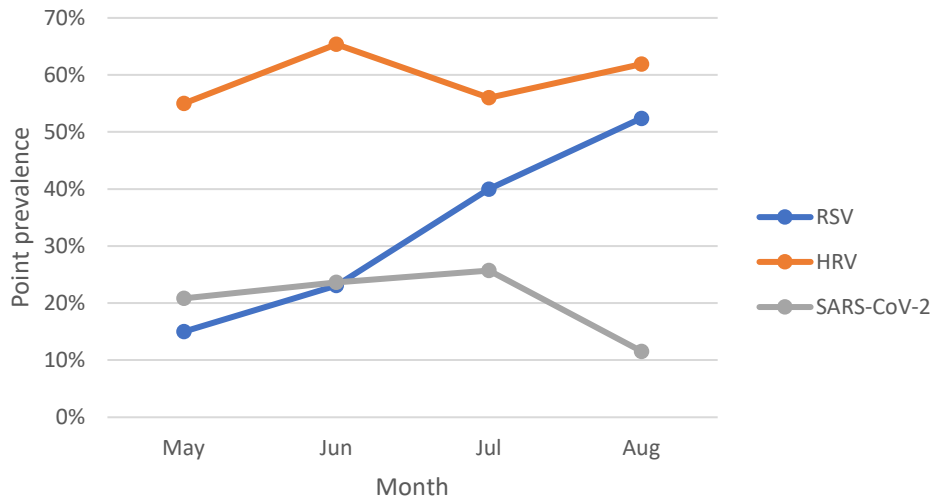
In multivariable analyses SARS-CoV-2 positive children:

- were more likely to be female (OR 2.68, 95% CI 1.18 – 6.07)
- had lower WAZ scores (OR 0.77, 95% CI 0.63-0.93)
- were more likely to have fever (OR 3.56, 95% CI 1.54-8.24) but less likely to have cough (OR 0.27, 95% CI 0.11-0.66)
- were not more likely to have a co-morbid condition
- were not more likely to need respiratory support, but if required this was needed for longer time period (OR 1.1, 95% CI 1.01 – 1.20)

Conclusion:

This study provides further evidence of severe COVID-19 infection among young South African children, with high morbidity and health resource implications.

Fig 1: Point prevalence of RSV, HRV and SARS-CoV-2 during May to August



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