

**Specific Objectives**

- To capture the strategies used to strengthen services and pathways for children, young people and families
- To identify the barriers to better patient care within the paediatric department
- To facilitate shared learning

**Methods** In June 2020, to capture the rapid changes in response to the coronavirus pandemic, the quality improvement 'Change Wall' initiative was used. Core teams and individuals in the paediatric department at Musgrove Park Hospital were asked five questions regarding changes to the department based on plan, do, study, act (PDSA) cycles. Responses were collated and shared via a wall display to disseminate key learning points.

**Results** We had responses from 13 teams within the paediatric department. Results showed respondents were broadly aiming to address three aspects of care in response to the coronavirus pandemic: ensuring appropriate and timely paediatric support for the acute services; striving to continue to maintain high quality communication with patients and their families; and to alter the physical environment in order to reduce the potential transmission of COVID-19.

Data captured showed multiple initiatives have been introduced. A key development was the introduction of a second paediatric high dependency area. An outpatient department working party was established and the waiting lists for new patients reduced from six months to two weeks. With paediatric oncology patients no longer able to ring the bell to celebrate the end of their treatment, a 'party in a box' was introduced.

To be able to provide greater out-of-hours support, the children and young people's mental health team and diabetes nursing team flexed their patterns of working.

Colleagues in the children's eating disorder service have changed their working too, which has helped to prevent long inpatient admissions. In one innovative case, they offered nasogastric tube feeding top ups at home, supported by the children's community nursing team, and prevented a child from being admitted to the most specialist care for four to six months.

**Conclusions** Overall, many of the changes have been felt to be positive and are being evaluated to continue long term because of the perceived benefit to patient care and the potential to ease winter pressures. We plan to continue to use the change wall to capture changes made within paediatrics beyond coronavirus. This will allow us to continue to disseminate knowledge of changes happening and inspire further change. We plan to re-visit each team in the next six months to explore which improvements have been sustained or adapted. Moving forward we also aim to capture the view of the patient and parent/carer with regards to their perceptions of changes made.

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### CLINICAL FEATURES AND OUTCOMES OF NEONATAL COVID-19: A SYSTEMATIC REVIEW

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**Background** In general, children with COVID-19 have milder illness and better prognosis compared to adults.

However, the neonatal population (from birth to 28 days of life) may be more vulnerable to severe COVID-19 disease due to the immaturity of neonatal immune system and possibility of in-utero infection from infected mothers. Comprehensive data on neonatal COVID-19 manifestations is currently lacking.

**Objectives** We aimed to determine the clinical manifestations and outcomes of neonates with COVID-19, and characterise these clinical characteristics based on illness severity.

**Methods** A systematic review (CRD42020183500) was conducted following the PRISMA guidelines with Embase, PubMed, and China Knowledge Resource Integrated (CNKI) databases until 1 August 2020. Additional studies were identified from references of included studies and the John Hopkins Centre for Humanitarian Health database. Studies reporting neonates ( $\leq 28$  days old) who tested positive for SARS-CoV-2 by reverse transcriptase PCR (RT-PCR) were included. Descriptive statistics were used to compare mild-moderately ill neonates (non-severe group) with severely-critically ill neonates (severe group). This grouping was based on the World Health Organization's definition. Continuous variables were analysed using Wilcoxon-Rank Sum Test. Dichotomous or categorical data were analysed with Chi-square and Fisher's Exact Tests. Quality of the studies were reviewed with Newcastle-Ottawa Scale and Murad Tool.

**Results** Sixty-seven studies were included out of 199 full text articles screened. Studies comprised of case reports, case series or cohort studies. Of ninety-nine neonates with COVID-19 infection, 72 (72.7%) were symptomatic. Amongst the symptomatic neonates, respiratory symptoms were common: shortness of breath (36.1%), nasal symptoms (19.4%), cough (18.1%). Other symptoms included fever (55.6%), feeding problems (31.9%) and gastrointestinal (GI) symptoms (16.7%). Lymphopenia was present in 43.9% (18 of 41 neonates tested). Elevated C-reactive protein was only reported in 13.2% (5 of 38 neonates tested), while 65.4% (34 of 52 neonates) had chest radiographs suggestive of pneumonia. Thirty neonates (30.3%) had severe-critical illness (severe group), while 69 (69.9%) had mild-moderate illness (non-severe group). Compared with the non-severe group, more neonates in the severe group were symptomatic (100% vs 60.9%,  $p < 0.001$ ), had dyspnoea (66.7% vs 14.3%,  $p < 0.001$ ) and abnormal chest radiographic findings (84.6% vs 61.5%,  $p = 0.038$ ). Accordingly, more neonates in the severe group were admitted to the intensive care unit (91.7% vs 41.7%,  $p < 0.001$ ). On the contrary, mild-moderately ill neonates had increased incidence of fever (69.0% vs 36.7%,  $p = 0.006$ ), and GI symptoms (26.2% vs 3.33%,  $p = 0.01$ ). Ten out of 11 of mild-moderately ill neonates displaying GI symptoms did not have dyspnoea. Laboratory findings, duration of hospital stay, birth characteristics and age at COVID-19 diagnoses were similar between these two groups. No mortalities were reported.

**Conclusions** Prognosis of COVID-19 neonates were favourable. We postulate that GI symptoms alone predict a better prognosis, while GI symptoms with dyspnoea predict a worse prognosis, as observed in adults. However, our studies were of moderate quality, and clinical findings and investigation results were not completely reported. As the pandemic evolves, prospective studies and more systematic reporting of cases will improve our understanding of neonatal COVID-19 and verify utility of symptoms and laboratory tests in predicting the severity of disease.