LETTER

Testing strategy for SARS-CoV-2 in the paediatric emergency department

The rapid spread of the novel coronavirus (severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)) in Italy forced a prompt hospital reorganisation in the past 2 months. Every clinic has been divided into two separate departments, based on the detection of SARS-CoV-2 in the nasopharyngeal swab. In children, three main variables complicate this: first, the not optimal sensitivity of nasopharyngeal swabs, mainly due to technical difficulties; second, the need of a caregiver during the hospital stay; finally, the high number of paediatric diseases manifesting with fever or cough, thus sharing symptoms of COVID-19, which cause about 25% of hospital stay; finally, the high number of paediatric cases. All these elements make the paediatric testing strategy more challenging.

We performed an observational study at Regina Margherita Children’s Hospital of Turin. Two cohorts of patients were collected: cohort A included all the children admitted to the ED from 2 March 2020 through 22 April 2020, with COVID-19-related symptoms; cohort B was composed of patients without any COVID-19-associated symptoms, who were swabbed as a screening test before hospital admission, between 31 March 2020 and 22 April 2020. Three hundred and forty-five patients were tested, 169 females and 175 males, with a median age of 3.91 years (range, 0–18 years). Two hundred and forty-five patients were enrolled in cohort A, 46.7% were females, equally distributed into age groups. One hundred and sixty children were admitted, and at least one of their parents was tested for SARS-CoV2, proving positive in 18 cases. Twenty-five children were positive for SARS-CoV2, and another five patients were admitted to the COVID department due to the positivity of parents’ nasal swab. Clinical findings of cohort A patients are summarised in table 1.

Cohort B was composed of 100 patients, 55% females. A parent of all patients was tested for SARS-CoV2; one child and two parents were positive. We found 7% and 2% of parents in the two cohorts were positive for SARS-CoV-2, despite the local population rate being 0.4%. Only 4 out of 20 of them were mildly symptomatic (cough, low-grade fever or smell and taste dysfunction). Their families were composed on average of four people; in 11 cases they reported a confirmed or possible contact with a COVID-19 case.

We analysed the children’s symptoms to identify COVID-19 in the paediatric ED. Cough was the only isolated manifestation significantly associated with SARS-CoV-2 infection. Fever was significantly related to COVID-19 only if paired with another symptom. The risk of infection was not associated with the number of symptoms. Conversely, a previous COVID-19 parental contact made it around 10 times more likely that the symptomatic child was affected by COVID-19 (relative risk 9.93).

An asymptomatic child with a forearm fracture and five symptomatic children, all negative for SARS-CoV-2, were admitted to the COVID-19 department based on the caregiver’s positive test for SARS-CoV-2. In one of these cases, the child was retested, proving positive.

If one of these misdiagnosed COVID-19 couples (child and caregiver) had been admitted to the COVID-free area, healthcare workers might have been exposed to the virus, increasing the risk of nosocomial spread of the infection.

To our knowledge, this is the first report that highlights the importance of analysing the children’s caregivers before hospital admission. Our study suggests that for every 100 children tested in the ED during COVID-19 pandemic, despite a negative result, at least two of them had a parent positive for SARS-CoV2.

For this reason, regardless of the reason for the admission, we propose to regularly test both children and their caregivers on admission to the hospital to increase the sensitivity of the test and to allow the correct allocation of patients, avoiding the in-hospital spread of the infection.
AV and RR critically revised the manuscript. CB and SG supervised data collection and critically reviewed the manuscript. All authors approved the final version of the manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; internally peer reviewed.

This article is made freely available for use in accordance with BMJ's website terms and conditions for the duration of the covid-19 pandemic or until otherwise determined by BMJ. You may use, download and print the article for any lawful, non-commercial purpose (including text and data mining) provided that all copyright notices and trade marks are retained.

© Author(s) (or their employer(s)) 2020. No commercial re-use. See rights and permissions. Published by BMJ.

To cite Denina M, Aguzzi S, Versace A, et al. Arch Dis Child Epub ahead of print: [please include Day Month Year]. doi:10.1136/archdischild-2020-319806

Accepted 16 June 2020
Arch Dis Child 2020;0:1–2.
doi:10.1136/archdischild-2020-319806

ORCID iD
Marco Denina http://orcid.org/0000-0002-8495-1844

REFERENCES