Canadian Paediatric Surveillance Program Commentary on Hospitalizations from COVID-19 among children in Canada

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With school re-opening across Canada, there is concern about the risks to children from acute SARS-CoV-2 infection (COVID-19). Parents, teachers, and policymakers are trying to make the best decisions for children based on the available data. Recognizing the need for paediatric-specific data on the impact of COVID-19 on children in Canada, the Canadian Paediatric Surveillance Program (CPSP), a joint program of the Canadian Paediatric Society (CPS) and the Public Health Agency of Canada (PHAC), launched the CPSP COVID-19 surveillance study at the beginning of April 2020.

Leveraging the established infrastructure of the CPSP, this study was designed to collect data on paediatric patients (children from birth to their 18th birthday) diagnosed with COVID-19 throughout the pandemic. Specifically, the study captures data from children with clinician reported microbiologically confirmed COVID-19 infection who were either hospitalized or considered to be potentially at "high risk" of severe outcomes due to their very young age (less than 12 months) or an underlying complex medical condition. Following reports of a new, paediatric multi-system inflammatory syndrome temporally associated with COVID-19 (also known as MIS-C, or Multisystem Inflammatory Syndrome in Children), the study protocol was amended to also include cases of MIS-C. Current case definitions of MIS-C include all suspected cases temporally linked to COVID-19, with or without microbiological or serological confirmation.

The CPSP COVID-19 study identifies cases through voluntary weekly questionnaires of approximately 2,800 paediatricians and paediatric subspecialists practicing in hospitals and community practices across all jurisdictions in Canada. Participants are asked to indicate if they have encountered a new case meeting one of the surveillance case definitions. If so, they are directed to complete a detailed questionnaire online. As per CPSP policy, the CPSP protocol and questionnaire have been reviewed to meet the privacy and research ethics requirements of PHAC, receiving the necessary approvals from the home institutions of the principal investigators and from each province. The full study protocol, list of investigators, and questionnaire is available online.[1]

This report addresses the risk of hospitalization and severe disease in children with COVID-19 in Canada. Given the urgent need for paediatric- specific data in the context of school re-opening, the lead investigators felt it necessary to communicate results on these outcomes, pending full publication on the epidemiology and risk factors for hospitalization, and outcomes among all children with co-morbidities.

Data on hospitalization and outcomes presented here have been compiled using cases reported to the CPSP until August 20th 2020 as well as through the CPSP COVID-19 network of investigators, representing the major tertiary care paediatric centers in Canada who generally manage most severe acute COVID-19 in children. In addition to cases reported and registered to date in the CPSP database, investigators were contacted during the week of August 20th 2020 to reconfirm case numbers and report any additional cases that may not yet be registered into the CPSP system.

This report does not include details on children with the MIS-C. Analyses of MIS-C cases are underway, and early results will be communicated as soon as they are available.

As of August 26th 2020, 10 467 cases of SARS-CoV-2 among children 0-19 years of age have been reported to PHAC, including 149 hospitalizations (1.3% of all hospitalizations for COVID-19 in Canada), and 29 ICU admissions (1.2% of all ICU admissions for COVID-19 in Canada). [2] 111 of these hospitalizations and 13 ICU admissions among children 0-18 years of age have been reported to the CPSP investigators. Among those for whom the cause of hospitalization is known (n=89), only 51% were clinician identified as COVID-19 related. In the remaining cases, hospitalization was for other reasons (including surgery) with an incidental finding of SARS-CoV-2 infection on admission screening, or for isolation purposes (e.g. children transferred from long-term care facilities for quarantine after testing positive.) Of the 13 ICU admissions, less than 5 (0.04%) required mechanical ventilation, and no deaths were reported to CPSP. In comparison, PHAC data reports that among the 84 979 cases of all ages for whom hospitalization status was available, 13.5% of of these cases were hospitalized, 20.3% required ICU, and 4.1% mechanical ventilation.

Limitations to these findings include 1) Different paediatric age case definitions: While the CPSP study incudes children less than 18 years of age, PHAC data includes data on children less than 20. CPSP therefore will not capture hospitalizations and outcomes among those 18-19 years of age 2) Unreported cases: Children hospitalized in a non-tertiary care center (i.e. a site not represented by the list of investigators) may not have been reported, as CPSP reporting is voluntary. While possible, we believe that this is unlikely, as dominant practice patterns would dictate that children with COVID-19 requiring hospitalization be referred to a major paediatric health care facility.3) Delays in reporting cases to CPSP: While PHAC cases are reported based on positive tests by reference labs and thus are captured in near real time, CPSP reports by physicians may be delayed and thus reported in weeks following their actual diagnosis.

In summary, these data illustrate that acute COVID-19 in Canadian children is mild in severity compared to Canadian adults, with 1.3% of paediatric cases being hospitalized and only 51% of those COVID-19 related. However, it is important to note that these data were collected during a period of time in which most children were not attending school and had significantly reduced exposure to other children and adults. These data also do not allow us to make inferences on the risks of transmission from children to adults within schools, the home, or community. Tracking the paediatric experience with this novel virus will be critical following the reopening of schools, to help guide public health practice in Canada.

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