

Self-perception of acute symptoms in adolescents with COVID-19



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SARS-CoV-2 infection among children and adolescents cause less severe illness and fewer deaths compared to adults.^{1,2} The biological mechanisms for the age-related differences in severity are still under investigation but diversity in functioning and maturity of the immune system existing between the young and the adults seem to play a fundamental role.³

While many data are available that well describe the disease in hospitalized adolescents,^{4,5} not much is known about the outcome of those who contract SARS-CoV-2 infection without requiring hospitalization. In particular, the few studies available report information provided by adult proxy, while we know very little about how adolescents perceive the disease.

A new important contribution filling this gap appears in this issue of the *Lancet Regional Health – Europe*, a retrospective analysis providing useful information on self-perception of disease severity in European adolescents.⁶ The study has a straightforward design: a questionnaire was submitted to all Danish teenagers between 15 and 18 years who had a positive PCR for SARS-CoV-2. A total of 6,630 subjects answered the questionnaire giving a clear picture on how the Danish adolescents perceived the acute symptom burden of SARS-CoV-2 infection. The median age of responders was 17.6 years, 58.4% were female. One third had no symptoms, while mild or severe symptom were reported by 57% and 9%, respectively. Females reported more symptoms than males but the fact that more girls answered the questionnaire might represent a bias. No criteria for symptom burden were given so the results are certainly influenced by subjectivity. Duration of the symptoms, a more objective parameter, ranged from 1 to 10 days in almost 70% of the subjects, but in 20% the symptoms persisted for more than

14 days (more details in the [Figure 1](#)). In the overall study population, the most prevalent symptoms were headache (39%), anosmia (36%), cough (32%), sore throat (31%), and ageusia (31%) ([Figure 1](#)). The subgroup reporting a severe burden of disease experienced a higher number of symptoms (eight versus two in the general population) and headache (81%), anosmia (67%), malaise (67%), fever (65%) were the most prevalent ([Figure 1](#)). The authors also looked at clinical history and conditions associated with symptom burden documenting that age, history of asthma, allergy, eczema, OCD/anxiety/depression, and previous Epstein-Barr virus infection were all associated with both the number and the severity of symptoms. Asthma and certain mental health conditions were common also in previous studies⁷ ([Figure 1](#)).

In terms of severity and duration of the disease, the results are in line with those already present in the literature; however, the incidence of the different symptoms is variable.⁸ Several factors could justify this discrepancy: for instance, the different methodology used to collect the data is certainly impacting the numbers. Interestingly, the results tend to vary between different geographical areas. An international network cohort analysis considering real-world data regarding children and adolescents diagnosed and/or hospitalized with COVID-19 collected from European primary care records, South Korean and US claims plus hospital databases showed that there are several differences between America, Asia, and Europe.⁹ The variability across health care systems, different measures of containment of the pandemic, possible genetic and environmental factors as well as the type of therapy used may explain the observed epidemiological and clinical differences.

Despite the lack of homogeneity of the results reported in different studies and between different geographic areas, one thing is certain: the mortality rate is low, but serious complications including hospitalization, hypoxemia, pneumonia and myocarditis^{1,9,10} are more frequent in adolescents with COVID-19 compared to in those with influenza.⁸ In addition, this new Danish study confirms that the symptom burden of SARS-CoV-2 infection is not trivial even when the disease is less severe and underlines the importance of extending

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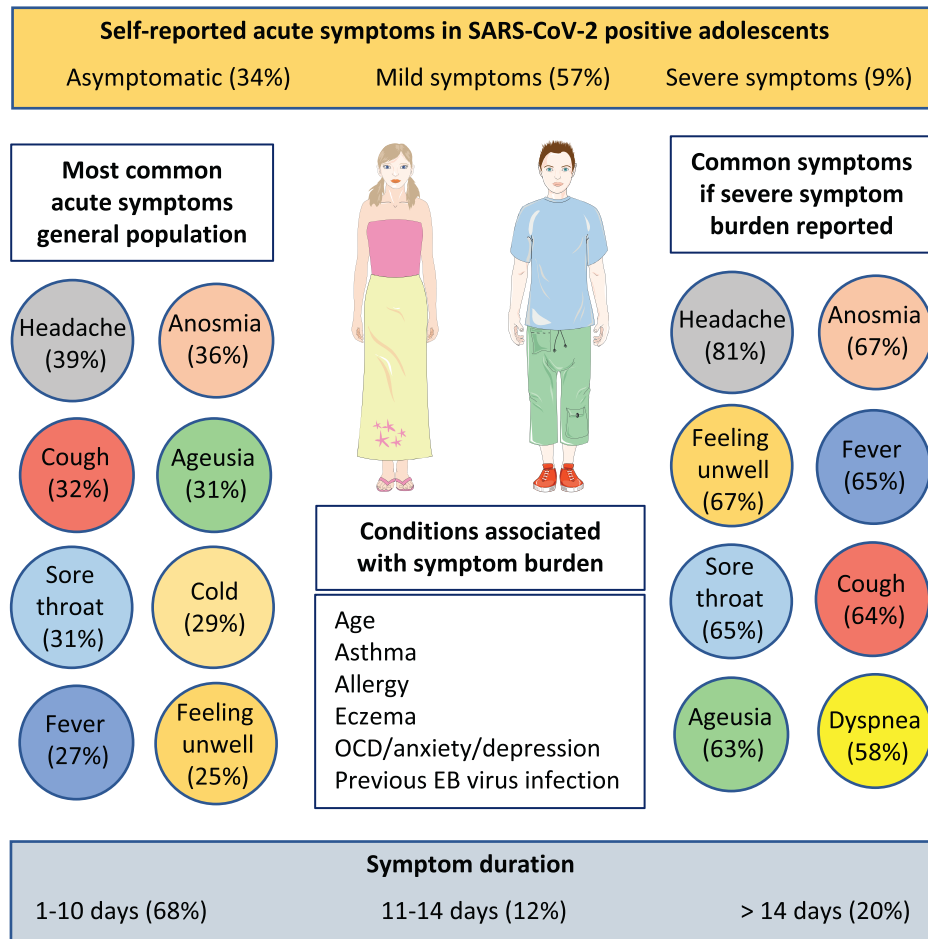


Figure 1. Main findings from a survey on how Danish adolescents testing positive for SARS-CoV-2 self-perceived acute symptoms.

measures to prevent symptomatic COVID-19 to include the youngest, especially the adolescents. It should be noted that these data refer to the first phase of the pandemic, when the Alpha and/or Delta variants of SARS-CoV-2 were dominant. Now that Omicron variants are dominant, the clinical manifestations of the disease are likely different, and the introduction of vaccines might have itself changed the scenario. A new study including both vaccinated and non-vaccinated adolescents would help establishing if, besides reducing mortality and ICU admissions, immunization is effective also in limiting symptom burden. Such data, together with those relating to the side effects of anti-SARS-CoV-2 vaccines, would go a long way in establishing evidence-based guidelines for prevention and treatment of COVID-19 in the youngest.

Finally, as in the case of adults, also for adolescents it would be desirable to understand more in depth the immunological, cellular, and possibly genetic mechanisms that influence the severity of the disease. This would help identifying therapeutic targets to prevent or cure COVID-19 and, more generally, it would lead us to a deeper understanding of the mechanisms by which

the immune system can be modulated to better defend ourselves in the event of future pandemics.

Contributors

MG as the sole author of this comment, contributed to all aspects of the paper.

Declaration of interests

None

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