No One Will be Safe Until Our Children are Safe: Parent's Attitude Towards COVID-19 Childhood Immunization

To the Editors:

Containment of the devastating coronavirus disease 2019 (COVID-19) pandemic could be completed by means of a comprehensive, global immunization program. The United Nations rightly claims that "No one will be safe until everyone is safe." This mainly states that equity between all countries, genders, ethnic or religious groups is imperative to prevent the ongoing spread of infection, as well as for ethical and equal justice considerations.[1]

Currently, high-income countries (HICs) are immunizing at a much faster rate than low-income countries (LICs). This is likely to increase inequity and increase the risk of an ongoing pandemic, possibly with new viral variants. However, unvaccinated adults are not the only possible reservoir for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus. There are almost 2 billion children younger than 14 years of age in the world (https://www.unfpa.org/data/world-population-dashboard). Children are less likely to be infected by SARS-CoV-2 and infected children generally experience milder clinical symptoms when compared with adults.[2] However, SARS-CoV-2 can cause severe illness in children,[3] including the multisystem inflammatory syndrome (MIS-C), which can be fatal. Children do carry the virus and have the ability to contribute to the ongoing spread in communities.[4] In addition, there are indications that children may suffer from the so called long-COVID.

The United Nations claims that "No one will be safe until everyone is safe," raising the question of childhood COVID-19 vaccination. It must be argued that if the vaccines are shown to be safe for children, they should have the right of protection against SARS-CoV-2 infection, and it must be recognized that children may become an important reservoir for the virus. We believe that when global adult and risk group COVID-19 vaccination has been achieved, childhood COVID-19 immunization should be initiated.

Iceland is a HIC with a very positive attitude towards childhood vaccinations[5] and childhood immunization coverage well above 90%. To evaluate parental views on potential COVID-19 vaccinations in childhood, we performed two surveys in Iceland. In the first survey we received answers from 3373 parents of children younger than 16 years of age where the parents indicated if they would accept COVID-19 immunization for their children. In a separate study, we received answers from 2480 parents of children less than four years of age to the same question (Fig. 1).

The conclusion from both surveys was that parents in Iceland have a very positive attitude towards COVID-19 childhood immunization (Fig. 1), even for very young children, despite the lack of severe COVID-19 disease in the Icelandic pediatric population. This is encouraging, especially as the surveys were done in February and March 2021, before a discussion on childhood vaccination was initiated in the media.

Our results provide important information on parental perspectives on COVID-19 immunization that may help policymakers deciding on further public health measures including COVID-19 childhood immunization when adequate, adult global vaccine coverage has been achieved. With the recent FDA approval of at least one vaccine for 12- to 15-year-olds, this becomes even more relevant. Protecting children as well as adults against SARS-CoV-2 may enhance the possibility of keeping "everyone safe."

Ásgeir Haraldsson, MD, PhD
Children's Hospital Iceland
Landspitali University Hospital
Iceland
University of Iceland
Faculty of Medicine
Reykjavík, Iceland

Thorvardur J. Love, MD, PhD,
University of Iceland
Faculty of Medicine
Reykjavík, Iceland
Landspitali University Hospital
Iceland

Valtyr Stefansson Thors, MD, PhD
Children's Hospital Iceland
Landspitali University Hospital
Iceland
Faculty of Medicine
University of Iceland
Reykjavík, Iceland

The authors have no funding or conflicts of interest to disclose.

Address for correspondence: Ásgeir Haraldsson, MD, PhD, University of Iceland, Children's Hospital Iceland, Landspitali – University Hospital, 101 Reykjavík, Iceland. E-mail: asgeir@lsh.is.

ISSN: 0891-3668/21/4010-e388
DOI: 10.1097/INF.0000000000003236

ACKNOWLEDGMENTS

We thank Gunnar Steinn Ásgeirsson for assisting with data management.

REFERENCES

1. Haraldsson A. Vaccine implementation reduces inequity. *Lancet Glob Health*. 2018;6:e1264–e1265.
2. Zimmermann P, Curtis N. Why is COVID-19 less severe in children? A review of the proposed mechanisms underlying the age-related difference in severity of SARS-CoV-2 infections. *Arch Dis Child*. 2021;106:429.
3. Williams N, Radia T, Harman K, et al. COVID-19 severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in children and adolescents: a systematic review of critically unwell children and the association with underlying comorbidities. *Eur J Pediatr*. 2021;180:689–697.
4. Baggio S, L'Huillier AG, Yerly S, et al. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) viral load in the upper respiratory tract of children and adults with early acute coronavirus disease 2019 (COVID-19). *Clin Infect Dis*. 2021;73:148–150.
5. Óskarsson Ý, Guðnason Þ, Jónsdóttir GA, et al. Public opinion on childhood immunisations in Iceland. *Vaccine*. 2015;33:7211–7216.

Diagnosing Severe Acute Respiratory Syndrome Coronavirus 2–Associated Encephalomyelitis and Radiculitis Requires Verification of the Virus

To the Editors:

We read with interest the article by Khera et al (1) about an 11-year-old female who developed acute-onset quadruparesis and respiratory insufficiency shortly after onset of fever but without coughing or dyspnea. Neurologic abnormalities were attributed to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)–associated myelitis and radiculitis, as the patient tested positive for SARS-CoV-2 antibodies.[1] The study is appealing but raises concerns.

We do not agree with the diagnosis "longitudinal extensive transverse myelitis."[1] The patient had at least 3 cerebral lesions which were hyperintense on fluid-attenuated inversion recovery and diffusion weighted imaging.[1] However, there is no discussion about the etiology of these lesions. To further assess their etiology, we need to know the results of ADC maps and magnetic resonance angiography and if these lesions represent a cytotoxic or a vasogenic edema. Asymmetric, subcortical, fluid-attenuated inversion recovery hyperintense lesions are

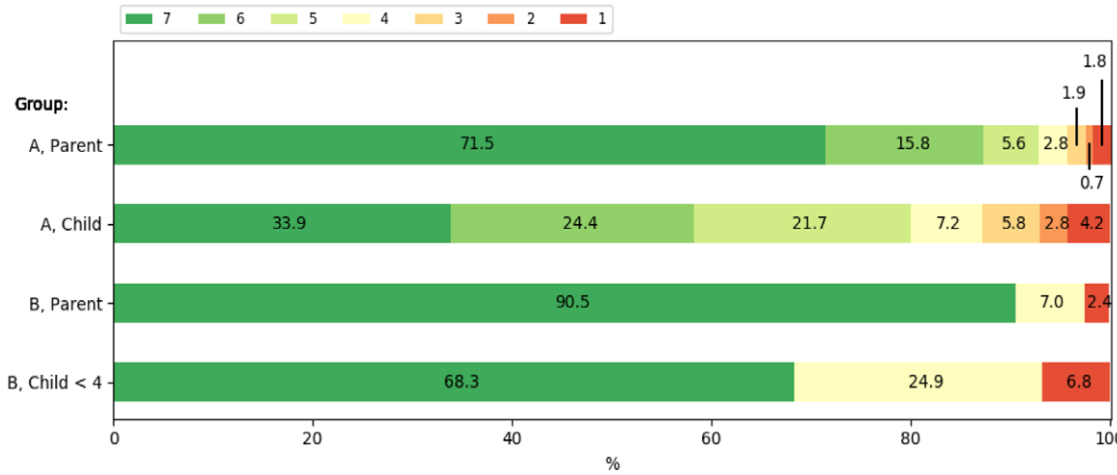

FIGURE 1. Results of questionnaires sent to parents on the attitude towards COVID-19 childhood immunization. **Group A**: 3373 parents answered an online survey conducted by the University of Iceland. Participation rate 43.2%. Questions: How likely or unlikely is it that you will accept COVID-19 vaccination when offered to you? If COVID-19 vaccination will be offered to your child/children (born 2006 or later), how likely or unlikely is it that you will accept the vaccination for your child/children? Answers: 1: Definitely not; 2: Very unlikely; 3; Rather unlikely; 4: Neither likely nor unlikely; 5: Likely; 6: Very likely; 7: Definitely. **Group B**: 2480 parents of children less than four years of age answered an online survey conducted by the Children's Hospital Iceland. Participation rate 61%. Questions: When COVID-19 vaccine will be available for you, will you accept it? When COVID-19 vaccine will be available for you, will you accept it for your child? Answers: 1: No; 4: Undecided/don't want to answer; 7: Yes. No parents declined participation in neither study. COVID-19, coronavirus disease 2019.

typical for acute, disseminated encephalomyelitis (ADEM).[2] ADEM lesions may be hyperintense on diffusion weighted imaging and may even enhance upon contrast medium.[2] Thus, we suggest diagnosing rather ADEM than longitudinal extensive transverse myelitis.

The patient presented with quadruparesis with lower limb predominance.[1] However, myelitis extended only between D7 and D10, which does not explain upper limb muscle weakness. Thus, we should know the results of nerve conduction studies of the upper limbs including results of F-wave studies. Assuming that upper limb weakness was due to radiculitis of cervical nerve roots and in the light of the diagnosis "motor axonal polyradiculopathy," we can expect increased F-wave latencies, normal nerve conduction velocity and reduced compound muscle action potentials of the radial, ulnar and median nerves. An argument against radiculitis, however, is that tendon reflexes on the upper limbs were preserved. Did cervical nerve roots enhance on cervical magnetic resonance imaging as did lumbar nerve roots? Arguments against the central nervous system lesion as cause of upper limb weakness are that the lesions were unilateral and in the postcentral areas. The discrepancy between the location of the central nervous system lesions and absence of sensory disturbances requires clarification.

It is unclear if respiratory insufficiency was muscular (ie, because of affection of the respiratory muscles in GBS), because of myelitis or because of pneumonia from the virus. Thus, we should know the results of thoracic computed tomography scans to confirm or rule out coronavirus disease 2019 pneumonia respectively acute respiratory distress syndrome. It would be interesting to know if nerve conduction studies of the phrenic nerve were carried out and if neuropathy had also affected this nerve.

Missing in Table 1[1] are reference limits for cerebrospinal fluid protein, why it cannot be assessed if cerebrospinal fluid protein was elevated, which is crucial for diagnosing GBS according to the Brighton criteria.

We should know how many days after onset of fever the patient tested positive for SARS-CoV-2 antibodies (become positive 1–3 weeks after onset). If the interval was >3 weeks, it is unlikely that SARS-CoV-2 was responsible for the neurologic compromise. In this case, the patient had experienced the viral infection already before onset of fever, suggesting that SARS-CoV-2 was not causative for ADEM with polyradiculitis, an association which has been previously reported.[3] We should know if dural arteriovenous fistula was excluded.[4]

Overall, this interesting study has several limitations which challenge the results and their interpretation.

Josef Finsterer, MD, PhD
Klinik Landstrasse, Messerli Institute
Vienna, Austria

Fulvio A. Scorza, MD
Disciplina de Neurociência, Universidade Federal de São Paulo/Escola Paulista de Medicina (UNIFESP/EPM)
São Paulo, Brazil

REFERENCES

1. Khera D, Didel S, Panda S, et al. Concurrent longitudinally extensive transverse myelitis and Guillain-Barré syndrome in a child secondary to COVID-19 infection: a severe neuroimmunologic complication of COVID-19. *Pediatr Infect Dis J.* 2021;40:e236–e239.
2. Kawanaka Y, Ando K, Ishikura R, et al. Delayed appearance of transient hyperintensity foci on T1-weighted magnetic resonance imaging in acute disseminated encephalomyelitis. *Jpn J Radiol.* 2019;37:277–282.
3. Martín Moyano J, Delgado Gil V, García Martín G. Guillain-Barré and transverse myelitis overlap syndrome: two case reports. *Med Clin (Barc).* 2021;157:214–216.
4. Whittam D, Huda S, Gibbons E, et al. A case series of intracranial dural arteriovenous fistulae mimicking cervical myelitis: a diagnosis not to be missed [published online ahead of print April 26, 2021]. *J Neurol.* doi: 10.1007/s00415-021-10571-0.

The authors have no funding or conflicts of interest to disclose.
Availability of Data: All data are available.
Ethical Approval: The research has been given ethical approval.
J.F. contributed to concept, writing literature search, and discussion. F.S. contributed to literature search, and discussion.
Address for Correspondence: Josef Finsterer, MD, PhD, Klinik Landstrasse, Messerli Institute, Vienna, Austria. E-mail: fifigs1@yahoo.de.

ISSN: 0891-3668/21/4010-e389
DOI: 10.1097/INF.0000000000003234