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ACTA PÆDIATRICA NURTURING THE CHILD WILEY

BRIEF REPORT

Will cases of multisystem inflammatory syndrome rise with the greater spread of the Omicron variant amongst children?

A number of variants have influenced global infection rates since COVID-19 was declared a pandemic in March 2020. Italy was the first Western country to be badly affected by the spread of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), and we are witnessing clear variations in the ages of infected subjects. Children now account for a higher percentage of people with the virus than they did at the start of the pandemic, and this raises concerns about whether we will see an increase in children with multisystem inflammatory syndrome associated with COVID-19 (MIS-C). Data provided by the Italian National Institute of Health, for the period 11 December 2021 to 11 January 2022, showed that 19.4% of the 2-million new cases of COVID-19 that were reported were patients under the 18 years of age.[1] This was much higher than the data provided by the Ministry of Health for the 6-month period up to 11 January 2022, which showed that 2.71% of the patients affected by COVID-19 were 12–19 years, and 4.65% were aged 5–11 years.[2] This new finding that 1 in 5 cases were paediatric patients also contrasts with the data published by the World Health Organization (WHO) for the first 30 days of the pandemic, which indicated that only 1.6% of the confirmed Italian cases were paediatric patients.[1]

The significant increase in paediatric cases of COVID-19 could be due to the combination of reduced restrictions and the emergence of new variants, notably Omicron. The Italian Government's measures for winter 20221/2022 have been very different to the previous winter. Schools have been kept open, with the help of surveillance testing, and distance learning has been less common. There has not been a lockdown and citizens aged 12 and over have been able to use green passes to gain access to public places, such as offices, gyms, bars and cinemas. Meanwhile, the spread of new variants may have contributed to making individuals who previously faced a lower risk more susceptible to this infection.[3] The SARS-CoV-2 Omicron variant was first isolated in South Africa in November 2021, and it has been defined as a variant of concern by the WHO.[3] It contains 32 mutations of the spike protein and is characterised by higher transmissibility and immune evasion, but lower pathogenicity.[3]

Italy started rolling out vaccines for selected age groups between 12 and 18 years in June 2021, which was about 6 months after the start of the international vaccination campaign. However, children under the age of 5 years are still not vaccinated. According to national data provided by Italian institutions, by 11 January 2022, 79.03% of the 4.6 million adolescents between 12 and 19 years had received at least one vaccine dose, 75.48% had received their second dose, and 7.97% had received their booster dose.[2] The vaccine for children aged 5–11 started to be rolled out in December 2021. By 11 January 2022, 18.44% had received at least one dose, and 2.43% had received their second dose.[2]

The acute disease still tends to be mild or asymptomatic in most paediatric cases, despite an increasing number of SARS-CoV-2 infections in children. But, the most fearful and serious complication at this age, especially for children who are not vaccinated, is MIS-C. This condition is a novel systemic hyperinflammatory disease that shares some of the typical features of toxic shock syndrome and of Kawasaki disease, despite being a very different condition.[4] It seems to affect children and adolescents who have had the SARS-CoV-2 infection in the last 2–6 weeks and the median age of those affected has been 8 years.[4] These patients can present with different signs or symptoms, including fever, conjunctivitis, cardiac manifestations, gastrointestinal symptoms, rashes and respiratory failure.[4] Children affected by MIS-C require hospitalisation for clinical surveillance and major therapies, and they are often admitted to paediatric intensive care units because they are in a critical condition.[4]

The real incidence of MIS-C is still not fully known. On the one hand, it is highly dependent on different risk factors, such as being aged between 6 and 12 years and obesity.[4] On the other hand, vaccination against SARS-CoV-2 seems to be a protective factor.[5] Population-based surveillance data from the USA has shown that, before the spread of the Omicron variant, vaccination reduced the incidence of MIS-C in 102 adolescents between 12 and 18 years of age. The data showed that 95% of those who were diagnosed had not been vaccinated, and the remaining 5% had received 2 doses of the vaccine at least 28 days before they were hospitalised.[5]

Abbreviations: MIS-C, multisystem inflammatory syndrome associated with COVID-19; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

We do not know if MIS-C may be more or less associated with the SARS-CoV-2 Omicron variant. Several studies have been evaluating the risk of MIS-C during different pandemic waves, according to the variants in circulation at the time. However, we do know that the Omicron variant could evade immunity in vaccinated subjects, due to the numerous mutations in the spike protein.[3] If it can do this, we speculate that we could also see an increase in MIS-C cases triggered by the Omicron variant in vaccinated children and adolescents. However, we do not have any data to support this hypothesis at this stage. In addition, we need to bear in mind that only a very small percentage of children under the age of 12 are currently vaccinated and that vaccinations have not been approved for children under the age of 5. We also need to consider the increasingly high rate of children with SARS-CoV-2 infections who are mainly unvaccinated. This, combined with the major circulation of the Omicron variant, could lead to an increase in the incidence of MIS-C. It is very important that paediatricians investigate any history of SARS-CoV-2 infections in patients or family members when children present with fever, a poor general condition and the possible involvement of one or more organs. MIS-C should be considered if all other infections have been excluded. Future prospective studies will be needed to compare MIS-C cases triggered by the Delta and Omicron variants.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

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