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EDITORIAL

Addressing mental health issues in immunocompromised adolescents with chronic diseases during the COVID-19 pandemic

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*See paper by Lindoso et al. in pages x-y. The COVID-19 pandemic has caused a major disruption of the everyday lives of children and adolescents around the world. Although adolescents are generally not at risk of developing severe COVID-19,¹ they were heavily impacted by changes in their daily lives, including social isolation due to school closures and physical distancing, decreased peer interactions, restrictions on physical activity, and increased family stress.^{2,3} While social distancing measures helped contain the virus, they also caused notable adverse effects on adolescents' mental and physical health. Several cross-sectional^{4,5} and longitudinal studies⁶ based on the general adolescent population reported increased prevalence of mental illnesses during the COVID-19 pandemic, and meta-analysis of pooled data including 80.879 children and adolescents revealed that the prevalence of depression and anxiety, the two most common mental health concerns in youth, have doubled compared with pre-pandemic estimates and remained high also later in the pandemic.⁷ Adolescents with preexisting chronic medical conditions were exposed to additional precipitants of psychological stress during the pandemic such as missed or delayed healthcare appointments, uncertainty about the advancement of the disease, protective behaviors with quarantining, feeling of helplessness, and possible shortage of supplies of medicines.⁸ Therefore, from a

mental health perspective, it appears that they may be affected differently with the potential for a widening of existing disparities in health and developmental outcomes.

In *Jornal de Pediatria*, Lindoso and colleagues⁹ report their findings from a single-center, cross-sectional study of physical and mental health impacts during COVID-19 pandemic in 355 adolescents with different preexisting chronic immunocompromised conditions (gastrointestinal, liver, rheumatic or renal disease). Participants were aged 10-18 years of whom 61% were female. The study was conducted during the first year of the pandemic when all the restrictive measures to contain the spread of the SARS-CoV-2 infection were in place, including physical distancing, social isolation, and mandatory wear of face masks. Data were collected with the use of an online survey that included questions on the socio-demographic background, educational issues, healthcare routine, and the impact of quarantine on mental health during the COVID-19 pandemic. Additionally, the strengths and difficulties questionnaire (SDQ) was used as a screening tool to detect any emotional or behavioral problems linked with the pandemics in the previous month. The study showed no differences in the total difficulties score of SDQ in patients (30%) and controls (31%, $p = 0.775$), which is reassuring and shows that chronic immunocompromised conditions do not present an additional risk factor for physical and mental health problems in adolescents during the pandemic. Importantly, the study identified several subgroups of patients with chronic medical conditions that showed higher frequency of abnormal total difficulties score and need to be further monitored and

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assessed. The risk groups that were independently associated with abnormal total difficulties score in logistic regression analysis include female sex, household members working outside of home and fear of underlying disease activity or complication. Of note, the study also demonstrated protective factors that were inversely associated with abnormal total difficulties score of SDQ, such as school homework and physical activity. Additional analysis of patients with chronic immunocompromised conditions and preexisting psychiatric disorders underlined the specific vulnerability of this group that showed abnormalities in total difficulties score of SDQ, emotional, conduct, hyperactivity, and peer problems compared to those without psychiatric disorders. The study did not find any differences between patients with gastrointestinal, liver, rheumatic or renal conditions.

There are only a few reports addressing the impacts of the COVID-19 pandemic on mental health in adolescents with chronic immunosuppressive diseases,^{8,10,11} and the study by Lindoso and colleagues⁹ provides the first systematic assessment of this problem. Despite convincing results, there are important considerations when translating these findings into clinical practice. The study was designed as a cross-sectional online survey, which offered a fast and practical option for gathering data remotely during the first year of the pandemic but also have several limitations compared to traditional face-to-face interviews due to poor description of the patient selection and limited generalizability of findings to the target population.¹² The study involved a heterogeneous patient population with 11 different chronic immune-mediated diseases or diseases that required immunosuppressive medications, and it did not provide any information on underlying disease activity at the time of the online survey, there is a lack of data on disease duration and course as well as missing data on prescribed medications. Data on the activity of the underlying disease seems particularly important as the study results revealed fear of underlying disease activity as one of the independent risk factors associated with abnormal difficulties score of SDQ.⁹ Moreover, some of the investigated chronic diseases (e.g. childhood-onset systemic lupus erythematosus) could directly affect the central nervous system and cause a broad range of mental health disorders.

The effects of COVID-19 lockdown on mental health were more thoroughly examined in adult patients with various immunosuppressive diseases, and the published data consistently demonstrate a significant impact on anxiety levels and decreased quality of life.¹³⁻¹⁵ One of the strongest identified predictors of increased anxiety was fear due to the perceived risk of more severe COVID-19 infection in immunocompromised individuals, which was linked with ongoing media reports highlighting a greater risk of severe outcomes in these patients.¹³ On the other side, participation in different types of physical activity such as walking and exercise was positively associated with indicators of mental health and psychological wellbeing in adult patients with immunosuppressive diseases.^{16,17} Although the detrimental effects of lockdown on mental health are well established also in the general adolescent population,⁷ some data from recent studies suggest that these findings cannot be simply extrapolated to the at-risk adolescent population. For example, a Dutch longitudinal study¹⁸ reported a decrease in psychiatric

symptoms during the COVID-19 pandemic in adolescents with more severe pre-pandemic emotional and behavioral problems, while adolescents without significant pre-pandemic problems showed a small increase in depression and stress. Therefore, pre-pandemic health and disease activity could be an important determinants to understand how lockdown measures affect adolescent mental health problems and their resilience during the pandemic.

Future longitudinal analyses needs to be performed in order to be able to accurately assess the outcome and time course of adolescents with different immunocompromised conditions and to establish core risk as well as protective factors for mental health problems linked with the COVID-19 pandemic. Ideally, these studies should compare mental health status assessments before, during, and post-pandemic within each disease group and stratify patients based on the underlying disease activity. Regarding the diagnostic tools for assessing the mental health status, additional multimodal approaches could help to improve the diagnostic accuracy, including both parent-reported questionnaires and face-to-face interviews. Moreover, age-matched healthy control groups should be longitudinally examined and the data compared with at-risk adolescent populations.

Despite its limitations, the study by Lindoso and colleagues⁹ represents an important step in addressing the mental health issues in immunocompromised adolescents with chronic diseases during the COVID-19 pandemic and underscores the need to perform longitudinal studies in these patients to address and evaluate factors that influence psychological problems. Although the study findings look reassuring, the risk factors need to be taken into account in order to mitigate mental health concerns by adequate and timely intervention. Treating physicians should be well aware of potential psychological symptoms of anxiety and depression in immunocompromised adolescents and be able to perform basic screening. Adolescents with chronic immunosuppressive diseases and comorbid psychological problems or those at risk of developing mental health problems should be targeted and screened on a regular basis. For vulnerable adolescents and their families, intensive psychological support should be offered via psychoeducation and learning how to implement consistent and predictable routines around schoolwork, sleep, screen use, and physical activity.

Conflicts of interest

The authors declare no conflicts of interest.

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