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Detecting ADHD in Children with Supracondylar Humerus Fractures: New Insights

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Dear Editor,

We are writing to present our findings on the prevalence of attention deficit hyperactivity disorder (ADHD) symptoms in children with supracondylar humerus fractures (SUF). This study sheds light on an underexplored area and highlights the potential need for early screening and intervention for ADHD in pediatric orthopedic patients.

Elbow fractures, particularly supracondylar humerus fractures (SUF), are the most common type of fractures in childhood, often resulting from falls. Previous research has indicated that children with ADHD are at a higher risk of sustaining injuries, including fractures, due to their characteristic symptoms of inattention and hyperactivity/impulsivity. Despite the lack of a control group in our study, the prevalence of ADHD symptoms observed in our sample suggests a potential link worth exploring further. This study aims to highlight the need for early screening and intervention for ADHD in pediatric orthopedic patients to prevent future injuries and improve overall outcomes.

Attention Deficit Hyperactivity Disorder (ADHD) is a prevalent neurodevelopmental disorder characterized by persistent patterns of inattention, hyperactivity, and impulsivity that interfere with functioning or development. Globally, the prevalence of ADHD in children is estimated to range between 5% and 8%, with a similar observed in Brazil. Polanczyk et al. (2007) reported a worldwide prevalence of approximately 5.29%.

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ADHD significantly increases the risk of physical injuries. For instance, Prasad et al. (2018) found that children with ADHD had a 25% increased risk of fractures compared to their non-ADHD peers. Chou et al. (2014) and Guo et al. (2016) reported an increased fracture risk of 1.26 times and 1.41 times, respectively, in children with ADHD.

In Brazil, Costa et al. (2019) found that children with ADHD were significantly more likely to be involved in accidents leading to fractures, burns, and other injuries. The Brazilian Ministry of Health reported over 52,000 hospitalizations due to falls among children aged 0 to 14 in 2019 alone (Criança Segura, 2018).

Socioeconomic factors also play a role in ADHD prevalence and management. ADHD is more common in areas with higher social and economic vulnerability, as Russel et al. (2016) reported. This finding highlights the need for targeted public health interventions and improved access to diagnostic and treatment services for ADHD.

We investigated the presence of ADHD symptoms in a sample of children with SUF treated at the Orthopedics and Traumatology department of the Irmandade da Santa Casa de Misericórdia de São Paulo. We included 45 children (66.7% boys) aged 4 to 11 years (M=5.73; SD=1.88) with no previous diagnosis of ADHD. Researchers assessed ADHD symptoms using the Swanson, Nolan, and Pelham Questionnaire (SNAP-IV), which evaluates symptoms of inattention and hyperactivity/impulsivity. It is important to note that the SNAP-IV is a screening tool rather than a diagnostic instrument, which is crucial in interpreting our findings. We also collected data on the mechanism of the accident, emergency care history, socioeconomic status (SES), and school complaints. Data collection spanned from October 2021 to July 2022 using in-person and telephone interviews, with information stored in the REDCap software.

Our findings revealed a notable prevalence of ADHD symptoms among the children with SUF. Specifically, 28.9% exhibited symptoms of inattention, 31.1% exhibited hyperactivity/impulsivity, and 20% exhibited combined symptoms. These rates are significantly higher than the general population prevalence, which ranges from 5% to 8%. Boys were likelier to show these symptoms than girls, although the difference was insignificant. There was a significant association between school complaints and symptoms of inattention, suggesting that academic challenges may be a key indicator of underlying ADHD symptoms. However, there was no significant association between the number of emergency room visits due to accidents and ADHD symptoms nor between socioeconomic status and ADHD symptoms. This study was approved by the Ethics Committee of Santa Casa de São Paulo (Approval Number: 46121221.4.0000.5479).

The high prevalence of ADHD symptoms observed in our study underscores the potential need for routine screening in pediatric orthopedic settings. Early identification and intervention could be crucial in preventing further injuries and improving the quality of life for these children. We acknowledge several limitations of our study, including the lack of a control group and the cross-sectional design, which limits causal inference. Although our findings align with previous research suggesting a higher prevalence of ADHD among children with fractures, future research should include control groups and adopt longitudinal designs to understand better the temporal relationship between ADHD symptoms and fracture occurrence. Additionally, the relatively small sample size and the gender imbalance, with a higher proportion of boys than girls, may limit the generalizability of our findings. Boys are generally more prone to injuries, which could introduce bias in the results. Future studies should aim for larger, more diverse samples with balanced gender representation to enhance the validity and applicability of the findings. Moreover, using the SNAP-IV, a high-sensitivity but lower-specificity screening tool, may have led to inflated prevalence estimates. Future research should consider using more specific diagnostic tools to validate these findings.

In Brazil, high rates of childhood injuries make these findings particularly relevant. Data from the Brazilian Ministry of Health show that over 52,000 children were hospitalized due to falls in 2019 alone (Criança Segura, 2018). Costa et al. (2019) also found a higher likelihood of accidents leading to fractures among children with ADHD in Brazil. The significant association between school complaints and symptoms of inattention observed in our study suggests that academic challenges may be a key indicator of underlying ADHD symptoms, which aligns with findings by Serra-Pinheiro et al. (2008), who noted that teachers report more symptoms of inattention in children due to the demands for sustained attention in school.

Children with supracondylar humerus fractures exhibit a higher prevalence of ADHD symptoms compared to the general population. These findings highlight the importance of early screening and referral to specialists in orthopedic services. Further research with appropriate control groups is necessary to substantiate these observations and develop targeted interventions to reduce the risk of injuries among children with ADHD.

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Conflicts of Interest

The authors declare no conflict of interest.

References

Chou, I. C., Lin, C. C., Sung, F. C., & Kao, C. H. (2014). *Attention-deficit-hyperactivity disorder increases risk of bone fracture: A population-based cohort study*. Developmental Medicine & Child Neurology, 56(11), 1111-1116.

Criança Segura. (2018). *Análises de óbitos por faixa etária até 2018: Acidentes com crianças de 0 a 14 anos*. Retrieved from http://www.datasus.gov.br

Polanczyk, G., de Lima, M. S., Horta, B. L., Biederman, J., & Rohde, L. A. (2007). *The worldwide prevalence of ADHD: A systematic review and metaregression analysis*. American Journal of Psychiatry, 164(6), 942-948.

Prasad, V., West, J., Sayal, K., & Kendrick, D. (2018). *Injury among children and young people with and without attention-deficit hyperactivity disorder in the community: The risk of fractures, thermal injuries, and poisonings*. Child: Care, Health and Development, 44(6), 871-878.

Russell, A. E., Ford, T., Rosenberg, R., & Kelly, Y. (2016). *The association between socioeconomic disadvantage and attention deficit/hyperactivity disorder (ADHD): A systematic review*. Child Psychiatry & Human Development, 47(3), 440-458.

Serra-Pinheiro, M. A., Mattos, P., & Angélica Regalla, M. (2008). *Inattention, hyperactivity, and oppositional-*

defiant symptoms in Brazilian adolescents: Gender prevalence and agreement between teachers and parents in a non-English speaking population. Journal of Attention Disorders, 12(2), 135-140.