



Editorial

Pediatric Migraine: Diagnosis and Management

Vincenzo Raieli ^{1,*}  and Vittorio Sciruicchio ² 

¹ Child Neuropsychiatry Unit ISMEP—ARNAS Civico Palermo, 90134 Palermo, Italy

² Children Epilepsy and EEG Center, PO, San Paolo ASL, 70132 Bari, Italy

* Correspondence: vincenzoraieli@gmail.com; Tel.: +39-09-1666-6015

The WHO recognizes migraine as one of the most disabling diseases. Much has been clarified in terms of pathophysiology and diagnosis, and recently new horizons have opened up in treating migraine. However, this information, which comes mainly from studies conducted among adults, is also applied to children and adolescents. The available data, however, could be oversimplified with a risk of being misleading.

In fact, pediatric migraines are present starting from the first stage of development. Furthermore, they must be interpreted according to a dynamic evolutionary model that takes into account biological, psychological, and social aspects [1]. Preschool migraines must be differentiated, not only from migraine headaches in the adult population but also from migraines arising at school age and later in adolescence [1]. Therefore, the expectations regarding the treatment of child migraines are often different from those in treating adults [2].

There are numerous aspects regarding this condition requiring clarification, such as the chronobiological correlation between age and clinical aspects of migraine or the predictors of the clinical history of migraine in the short, medium, and long term. Furthermore, how lifestyle can influence headache features and what influences the response to drug therapy in children, which appears to be different from that in adults, should be investigated.

Further, little is known about what induces remission or resumption of migraine attacks throughout a subject's life, thus necessitating both short- and long-term follow-up studies.

Overall, the scientific community's interest in migraine in childhood has recently increased, as well as that in burden [3], physiopathological peculiarities [4,5], comorbidities [6,7], and lifestyle evaluation or modification [8,9].

At the developmental age, it is also easier to observe atypical clinical pictures due to clinical [10] and/or atypical topographical characteristics [11].

In recent years, a progressive increase in emergency department visits due to headaches has been registered, of which a conspicuous proportion are minors suffering from migraine attacks. Their management is difficult, and there is a need for both guidelines for therapy and avoidance of unnecessary testing [12,13].

The need to investigate the child population specifically derives not only from studies on migraine-afflicted adults (including human models), but also from pathogenetic, functional, and clinical-therapeutic studies from several areas of research suggesting that children are not simply "little adults" [14–17].

Currently, the most suitable model for interpreting a child's migraine is a bio-psycho-social model that takes into account the genetic-neurobiological, psychological, and behavioral aspects corresponding to the child's age and environmental conditioning [18]. Only from this perspective can the meaning of migraine for every child be grasped and, as result, an individualized diagnostic-therapeutic intervention can be planned. In our opinion, this is a very open field of research of interest for many researchers.

This Special Issue, "Pediatric Migraine: diagnosis and management", aims to collect contributions from researchers focused on the specific peculiarities of migraine in young



Citation: Raieli, V.; Sciruicchio, V. Pediatric Migraine: Diagnosis and Management. *J. Clin. Med.* **2022**, *11*, 7252. <https://doi.org/10.3390/jcm11247252>

Received: 28 November 2022

Accepted: 5 December 2022

Published: 7 December 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

subjects, who are in a developmental period involving significant changes in their biology and psychology.

The main goal is to provide useful suggestions and open the field up for further reflections and research initiatives.

Author Contributions: V.R. and V.S. equally contributed to the conceptualization and writing of the manuscript. All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Raieli, V.; D'Amico, A.; Piro, E. Migraine in Children Under 7 Years of Age: A Review. *Curr. Pain Headache Rep.* **2020**, *24*, 79. [\[CrossRef\]](#) [\[PubMed\]](#)
2. Raieli, V.; Compagno, A.; Puma, D.; La Vecchia, M.; Pandolfi, E.; La Franca, G.; Ragusa, D. Headache: What do children and mothers expect from paediatricians? *Headache* **2010**, *50*, 290–300. [\[CrossRef\]](#) [\[PubMed\]](#)
3. Leonardi, M.; Grazi, L.; D'Amico, D.; Martelletti, P.; Guastafierro, E.; Toppo, C.; Raggi, A. Global Burden of Headache Disorders in Children and Adolescents 2007–2017. *Int. J. Environ. Res. Public Health* **2020**, *18*, 250. [\[CrossRef\]](#) [\[PubMed\]](#)
4. Forland-Schill, A.; Berring-Uldum, A.; Mol debes, A. Migraine pathophysiology in children and adolescents: A review of the literature. *J. Child Neurol* **2002**, *37*, 642–651. [\[CrossRef\]](#) [\[PubMed\]](#)
5. De Tommaso, M.; Scirucchio, V. Migraine and Central Sensitization: Clinical Features, Main Comorbidities and Therapeutic Perspectives. *Curr. Rheumatol. Rev.* **2016**, *12*, 113–126. [\[CrossRef\]](#) [\[PubMed\]](#)
6. Altamura, C.; Corbelli, I.; de Tommaso, M.; Di Lorenzo, C.; Di Lorenzo, G.; Di Renzo, A.; Filippi, M.; Jannini, T.B.; Messina, R.; Parisi, P.; et al. Pathophysiological Bases of Comorbidity in Migraine. *Front. Hum. Neurosci.* **2021**, *15*, 640574. [\[CrossRef\]](#) [\[PubMed\]](#)
7. de Tommaso, M.; Scirucchio, V.; Delussi, M.; Vecchio, E.; Goffredo, M.; Simeone, M.; Barbaro, M.G.F. Symptoms of central sensitization and comorbidity for juvenile fibromyalgia in childhood migraine: An observational study in a tertiary headache center. *J. Headache Pain* **2017**, *18*, 1–10. [\[CrossRef\]](#) [\[PubMed\]](#)
8. Raucci, U.; Boni, A.; Evangelisti, M.; Della Vecchia, N.; Velardi, M.; Ursitti, F.; Terrin, G.; Di Nardo, G.; Reale, A.; Villani, A.; et al. Lifestyle Modifications to Help Prevent Headache at a Developmental Age. *Front. Neurol.* **2021**, *11*, 618375. [\[CrossRef\]](#) [\[PubMed\]](#)
9. Scirucchio, V.; Simeone, M.; Barbaro, M.G.F.; Tanzi, R.C.; Delussi, M.; Libro, G.; D'Agnano, D.; Basilianna, R.; De Tommaso, M. Pain Catastrophizing in Childhood Migraine: An Observational Study in a Tertiary Headache Center. *Front. Neurol.* **2019**, *10*, 114. [\[CrossRef\]](#) [\[PubMed\]](#)
10. Raieli, V.; Capizzi, M.; Marino, A.; Di Nardo, G.; Raucci, U.; Parisi, P. Study on “Atypical” Migraine Auras in the Pediatric Age: The Role of Cortical Spreading Depression and the Physiopathogenetic Hypothesis Arising from Our Clinical Cases. *Life* **2022**, *12*, 450. [\[CrossRef\]](#) [\[PubMed\]](#)
11. Raieli, V.; Reina, F.; D'Agnano, D.; Nocera, G.M.; Capizzi, M.; Marchese, F.; Scirucchio, V. The Pediatric Trochlear Migraine: Diagnostic and Therapeutic Implications. *J. Clin. Med.* **2022**, *11*, 2826. [\[CrossRef\]](#) [\[PubMed\]](#)
12. Perry, M.C.; Yaeger, S.K.; Toto, R.L.; Suresh, S.; Hickey, R.W. A modern epidemic: Increasing pediatric emergency department visits and admissions for headache. *Pediatr. Neurol.* **2018**, *89*, 19–25. [\[CrossRef\]](#) [\[PubMed\]](#)
13. Vetri, L.; Messina, L.M.; Drago, F.; D'Aiuto, F.; Vanadia, F.; Brighina, F.; Raieli, V. Are paediatric headaches in the emergency department increasing? An Italian experience. *Funct. Neurol.* **2019**, *34*, 188–195. [\[PubMed\]](#)
14. Maneyapanda, S.B.; Venkatasubramanian, A. Relationship Between Significant Perinatal Events and Migraine Severity. *Pediatrics* **2005**, *116*, 555–558. [\[CrossRef\]](#) [\[PubMed\]](#)
15. Huang, P.; Kuo, P.-H.; Lee, M.T.; Chiou, L.-C.; Fan, P.-C. Age-Dependent Anti-migraine Effects of Valproic Acid and Topiramate in Rats. *Front. Pharmacol.* **2018**, *9*, 1095. [\[CrossRef\]](#) [\[PubMed\]](#)
16. Liu, J.; Wang, G.; Dan, Y.; Liu, X. CGRP and PACAP-38 play an important role in diagnosing pediatric migraine. *J. Headache Pain* **2022**, *23*, 1–13. [\[CrossRef\]](#) [\[PubMed\]](#)
17. Hanci, F.; Kilinc, Y.B.; Kilinc, E.; Türey, S.; Dilek, M.; Kabakus, N. Plasma levels of vasoactive neuropeptides in pediatric patients with migraine during attack and attack-free periods. *Cephalalgia* **2020**, *41*, 166–175. [\[CrossRef\]](#) [\[PubMed\]](#)
18. Guidetti, V.; Cerutti, R.; Faedda, N.; Natalucci, G. Migraine in childhood: An organic, biobehavioral, or psychosomatic disorder? *Neurol. Sci.* **2019**, *40*, 93–98. [\[CrossRef\]](#) [\[PubMed\]](#)