

A case of Pediatric migraine treated with multidisciplinary approach.

Dr. Ragini Patil, Dr. Rohini Gulhane, Dr. Swati Maldhure

1 Associate professor Department of Psychiatry, Jawaharlal Nehru Medical College Datta Meghe Institute of Medical Sciences Sawangi Wardha.

2 Assistant Professor Department of Pediatrics, Datta Meghe Medical college, wanadongri, Hingna Nagpur.

3 Senior Resident Department of ENT, Datta Meghe Medical college, wanadongri, Hingna Nagpur.

Email id- ragini.tushar@gmail.com

ABSTRACT

Migraine is relatively common in all age group with a prevalence of 9% in pediatric population. 50% of these children continue to have migraine in adulthood. Various trigger factors for migraine have been identified like stress, irregular dietary and sleep habits, lack of physical exercise and excess use of screen like video games and mobile phone.

Management of migraine requires comprehensive approach which includes Pharmacological treatment, lifestyle changes and parental education.

We report a case of 15-year-old boy who presented with history of unilateral headache of moderate to severe intensity since one year. Frequency of headache initially was once in month which gradually increased to 2-3 episodes/month. Almost all episodes were associated with nausea, watering from eyes, irritability and difficulty in concentration in studies.

Patient reported precipitation of headache episodes with long hours of studies, irregular sleeping and dietary habits and increased stress levels due to approaching board exams. Ophthalmic and neurological examination was normal.

Patient was started on Amitriptyline 10 mg night dose and Propranolol 20 mg single night dose. Tab Naproxen 250 mg was advised on as needed basis for aborting acute attack. Along with this patient and Parents were counseled regarding following regular dietary habits, moderate exercise and maintaining sleep schedule. Patient was followed up fortnightly and at 3 months follow up patient reported reduced frequency of headache and increased academic performance.

Thus our case emphasizes the effective role of Tricyclic antidepressants, Betablockers and adaptation of healthy lifestyle.

Keywords: Headache, Naproxen, Propranolol, Pediatric migraine

Introduction

Headache is a common complaint in all age group worldwide, with around 50% prevalence in pediatric population. Population based studies have reported overall prevalence of migraine headache of 9% in pediatric population [1,2,3]. Around 50% of these children continue to have migraine in adulthood [4,5]. Migraine has significant negative impact on quality of life of affected individual. [6]

Various triggering factors have been identified in children. A retrospective study found most frequently reported trigger factor as stress (75.5% of patients), followed by lack of sleep (69.6%), warm climate (68.6%), and video games (64.7%) [7,8].

Various studies have also reported strong association between obesity and Migraine headache both in adult as well as pediatric population. Research also indicates role of obesity in migraine outcomes. (8,9) Obesity also is a strong risk factor determining migraine progression and frequency of migraine episodes. (10,11)

Both migraine and obesity are influenced by various environmental factors. The link between obesity and migraine is multifactorial mediated by various inflammatory mediators such as calcitonin gene related peptides like orexins. Neurotransmitters like serotonin and adipocytokines like leptin and adiponectin play role in both feeding and migraine thus explaining common pathophysiology (11,12).

Migraine has negative impact on quality of life of affected children. Parents frequently complain deterioration in physical, social and scholastic performance of children due to migraine headaches. Mood swings are common in migraineurs which may occur before during or after migraine attacks. The majority of mood changes are observed during prodromal phase manifesting as a psychobiological response like difficulty in thinking, concentrating in studies, irritability, confusion, higher or lower energy levels or even depression. (13)

Serotonergic system has been implicated in common pathophysiology of migraine and mood changes. The path of events related to altered serotonergic neurotransmission is not fully understood, but it has been proposed that 5-HT could influence trigeminovascular nociceptive pathways in migraines. Recurrent headaches can lead to depression and internalization, which often occur in adolescence (13). Clinical symptoms of depression in children with migraine appear to be different from those in adults (13,14). For example, feelings of humiliation, shame, desperation, loss, blame, inadequacy, and sadness might be expressed by an affected child (14).

Stress is the most common modifiable risk factor in migraine and also the determinant of chronicity and prognosis of headache. (15) Thus use of behavioural therapies and teaching effective coping style plays a very important role in migraine management. The other very important but neglected part in management of migraine is parental stress. A study reported high levels of stress in parents caring for migraine children. Informing parents about the clinical characteristics of paediatric migraine eg, the high frequency of attacks and accompanying symptoms, may help to reduce the perception of the child as difficult. For example, use of familiar coping strategies could help parents not to be afraid before and/or during the attacks and consequently reduce their stress levels. (15)

Early intervention using the multidisciplinary approach comprising of both pharmacological as well as non-pharmacological majors can significantly improve the prognosis of migraine [16,17,18]. The first and foremost important step in management of migraine is educating parents and children along with avoidance of all triggering factors for migraine headaches such as dietary as caffeine, cheese, alcohol and irregular dietary habits etc. Psychological and physical triggers like stress, worry, sleep deprivation etc. Pharmacological Management of migraine is divided under two lines - Acute treatment and maintenance treatment.

The goal of acute management is terminating each episode as it occurs and normalizing routine. Almost all pts require it. It includes isolation of pts in dark room, maintaining hydration, prescribing medicines like NSAIDs, Triptans and antiemetics. Maintenance or Prophylactic treatment aims at aborting future episodes. Drugs given for prophylactic treatment include Beta blockers, Tricyclic antidepressants, and anti-epileptics like Valproate, Topiramate and Calcium channel blockers.

Case Presentation

We report a case of 15-year-old boy who presented with complaints of headache for one year. He was a student of 10th grade and was average in studies. Patient described characteristics of headache as unilateral alternating between right and left side, throbbing with severity ranging from moderate to severe in nature. Frequency of headache in the beginning was once in month, which gradually increased to 2-3 times/week in last month. Headache was frequently associated with nausea, watering from eyes, irritability, and difficulty in concentrating in studies. Patient reported precipitation of headache episodes with long hours of studies, irregular sleeping and dietary habits and increased stress levels due to approaching board exams. Positive family history of Migraine headache was present in patient's mother. Complete physical and neurological examination was done and was normal. Ophthalmic evaluation was also normal.

Patient was started on Amitriptyline 10mg at night dose and Propranolol 20mg once daily as dose. Naproxen 250 mg was prescribed on as needed basis for aborting acute headache. Along with this, patient and his mother were explained about need to follow a routine sleep and dietary habits and with regular physical exercises. Patient was asked to maintain regular headache diary.

After 15 days follow up patient reported one episode of similar headache, though of less intensity. Rest all days were headache free. At one month follow up patient reported significant improvement with 2 episodes of headache which responded immediately to Naproxen. At 3 months follow up he was doing well with 2 episodes of dull headache. Patient also reported better concentration in studies and overall well-being.

Discussion

Our case indicated possible link between Migraine and its various triggering factors.

Research has identified three major triggering factors for pediatric migraine - Stress, poor sleeping habits and unhealthy dietary habits.

Stress in any setting including home or school environment can act as a major trigger for migraine episodes and further adds to poor quality of life. Poor family dynamics and parental discord has been identified frequently as triggering factor in majority of children with migraine. Thus, educating parents for ensuring positive family dynamics and good interpersonal relationships between family members can improve quality of life of patient by reducing frequency of migraine episodes. [3,16,17] Educating patients and their parents about maintaining good sleep hygiene and regular timings have found to add to successful migraine management. [3]

Although the evidence about dietary triggering factors for migraine are weak but maintaining regular and balanced diet habits have shown positive effects on migraine management.

Maintaining a prospective headache diary can help identify all the potential trigger factors though avoiding all of them could be impossible and stressful due to their diverse nature. [21,22] In current trend managing rather than avoiding all trigger factors is advisable and feasible way. An observational study has shown that kids with migraine use fewer pain coping strategies, it is thus very important to teach them mechanism of migraine and age-appropriate positive coping strategies. Parents and other caretakers play significant role in creating positive environment around children and tailoring child's lifestyles which includes regular sleeping habits, balanced diet plan and regular exercise as per their needs. [23,24,25]

Thus, we conclude that the effective way for managing and preventing headache attacks includes multimodal treatment like developing positive coping styles rather than avoiding stress along with pharmacological management. Our case also points towards effective role of Tricyclic antidepressants and Beta blockers in management of pediatric migraine.

References:

1. Abu-Arafeh, I.; Razak, S.; Sivaraman, B.; Graham, C. Prevalence of headache and migraine in children and adolescents: A systematic review of population-based studies. *Dev. Med. Child Neurol.* **2010**, *52*, 1088–1097.
2. Wober-Bingol, C. Epidemiology of migraine and headache in children and adolescents. *Curr. Pain Headache Rep.* **2013**, *17*, 341.
3. Gaku Yamanaka * , Shinichiro Morichi , Shinji Suzuki, Soken Go , Mika Takeshita, Kanako Kanou, Yu Ishida, Shingo Oana and Hisashi Kawashima. A Review on the Triggers of Pediatric Migraine with the Aim of Improving Headache Education
4. Bille, B. A 40-year follow-up of school children with migraine. *Cephalalgia Int. J. Headache* **1997**, *17*, 488–491.
5. Virtanen, R.; Aromaa, M.; Rautava, P.; Metsähonkala, L.; Anttila, P.; Helenius, H.; Sillanpää, M. Changing headache from preschool age to puberty. A controlled study. *Cephalalgia Int. J. Headache* **2007**, *27*, 294–303.
6. Dooley, J.M.; Augustine, H.F.; Brna, P.M.; Digby, A.M. The prognosis of pediatric headaches—A 30-year follow-up study. *Pediatr. Neurol.* **2014**, *51*, 85–87.
7. Charles, J.A.; Peterlin, B.L.; Rapoport, A.M.; Linder, S.L.; Kabbouche, M.A.; Sheftell, F.D. Favorable outcome of early treatment of new onset child and adolescent migraine-implications for disease modification. *J. Headache Pain* **2009**, *10*, 227–233.
8. Bigal ME, Liberman JN, Lipton RB. Obesity and migraine: a population study. *Neurology.* 2006;66:545–50.
9. Bigal ME, Tsang A, Loder E, Serrano D, Reed ML, Lipton RB. Body mass index and episodic headaches: a population-based study. *Arch Intern Med.* 2007; 167:1964–70
10. Verrotti A, Di Fonzo A, Agostinelli S, Coppola G, Margiotta M, Parisi P. Obese children suffer more often from migraine. *Acta Paediatrica.* 2012;101:416–21. doi:10.1111/j.1651-2227.2012.02768.x.
11. Farello^{1*}, P. Ferrara², A. Antenucci¹, C. Basti¹ and A. Verrotti¹The link between obesity and migraine in childhood: a systematic review G.
12. Parisa Gazerani^{1,2} Powers, S.W.; Gilman, D.K.; Hershey, A.D. *Review Migraine and Mood in Children*
13. Braccili, T.; Montebello, D.; Verdecchia, P.; Crenca, R.; Redondi, A.; Turri, E.; Turaccio, R.; Lendvai, D. Headache and psychological functioning in children and adolescents. *Headache* **2006**, *46*, 1404–1415.
14. Evaluation of anxiety and depression in childhood migraine. *Eur. Rev. Med. Pharmacol. Sci.* **1999**, *3*, 37–39

15. Maria Esposito¹ Beatrice Gallai² Lucia Parisi³ Michele Roccella³ Rosa Marotta⁴
Serena Marianna Lavano⁴ Antonella Gritti⁵ Giovanni Mazzotta⁶ Marco
Carotenuto¹ Maternal stress and childhood migraine: a new perspective on management

Neuropsychiatric Disease and Treatment Dovepress open access to scientific and medical research

16. Kabbouche, M.A.; Powers, S.W.; Vockell, A.L.; LeCates, S.L.; Ellinor, P.L.; Segers, A.; Manning, P.; Burdine, D.; Hershey, A.D. Outcome of a multidisciplinary approach to pediatric migraine at 1, 2, and 5 years. *Headache* **2005**, *45*, 1298–1303.
17. Soee, A.B.; Skov, L.; Skovgaard, L.T.; Thomsen, L.L. Headache in children: Effectiveness of multidisciplinary treatment in a tertiary paediatric headache clinic. *Cephalalgia Int. J. Headache* **2013**, *33*, 1218–1228.
18. Esparham, A.; Herbert, A.; Pierzchalski, E.; Tran, C.; Dilts, J.; Boorigie, M.; Wingert, T.; Connelly, M.; Bickel, J. Pediatric Headache Clinic Model: Implementation of Integrative Therapies in Practice. *Children* **2018**, *74*, 74.
19. Neut, D.; Fily, A.; Cuvellier, J.C.; Vallée, L. The prevalence of triggers in paediatric migraine: A questionnaire study in 102 children and adolescents. *J Headache Pain* **2012**, *13*, 61–65.
20. Arruda, M.A.; Arruda, R.; Guidetti, V.; Bigal, M.E. Psychosocial adjustment of children with migraine and tension-type headache—A nationwide study. *Headache* **2015**, *55* (Suppl. 1), 39–50.
21. McEwen, B.S.; Bowles, N.P.; Gray, J.D.; Hill, M.N.; Hunter, R.G.; Karatsoreos, I.N.; Nasca, C. Mechanisms of stress in the brain. *Nat. Neurosci.* **2015**, *18*, 1353–1363.
22. Orr, S.L.; Kabbouche, M.A.; O'Brien, H.L.; Kacperski, J.; Powers, S.W.; Hershey, A.D. Paediatric migraine: Evidence-based management and future directions. *Nat. Rev. Neurol.* **2018**, *14*, 515–527.
23. Orr, S.L.; Potter, B.K.; Ma, J.; Colman, I. Migraine and Mental Health in a Population-Based Sample of Adolescents. *Can. J. Neurol. Sci.* **2017**, *44*, 44–50.
24. Martin, P.R. Managing headache triggers: Think 'coping' not 'avoidance'. *Cephalalgia* **2010**, *30*, 634–637.
25. Goadsby, P.J.; Holland, P.R.; Martins-Oliveira, M.; Hoffmann, J.; Schankin, C.; Akerman, S. Pathophysiology of Migraine: A Disorder of Sensory Processing. *Physiol. Rev.* **2017**, *97*, 553–622.