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Pediatric Migraine

Recognition Management

Migraine headaches in children are a common but little-studied phenomenon. The landmark study by Bille¹ conducted in 1962 among Swedish school children found that the prevalence of migraine in children aged 7-15 years was 3.9%. Subsequent studies have found rates from 4% to 11%.²⁻⁵ Migraine occurs in younger children as well; onset of migraine in children as young as two years old has been reported.^{6,7}

The clinical features of pediatric migraine often resemble those of adult migraine, including one-sided head pain (although the pain may be bilateral), nausea and vomiting, prodromal symptoms and aura, photophobia and phonophobia. Preverbal children may become pale and withdrawn. Periods of sleep often provide relief. The headaches are acute, severe and recurrent with headache-free periods between episodes. They may occur several times monthly or only twice a year. Pediatric migraine differs from adult migraine in that it tends to be for shorter duration, often as little as 2 to 4 hours compared to 4 to 72 hours in adults.^{8,9}

A 1994 study described the characteristics of migraine among school children in Cleveland, Ohio.² The overall prevalence of migraine meeting International Headache Society criteria was 8.6%. There was a higher prevalence of migraine among girls (55% of total) than boys (45%); there was a positive family history of migraine in 66% of children with migraine. The average age of onset was 6.6 years. Prodromal symptoms were reported by 74% of the migraineurs, including hypoactivity, hyperactivity, irritability, depression, food cravings and yawning. Fifty-four percent of the children with migraine reported experiencing auras, including visual effects, numbness, tingling or weakness. The pain was described as throbbing by 62% of the children; others had either sharp or dull pain. Forty percent of the children had one to three attacks per month; frequencies of two to six per week and fewer than five per year were also reported. Forty-four percent reported that they stayed in bed during attacks and 26% said they were sometimes absent from school because of attacks.

Children also experience several variant types of migraine.⁹ Basilar artery migraine includes symptoms of dizziness, ataxia, visual field defects and syncope followed by the usual migraine symptoms of headache and gastrointestinal upset. The prevalence of this syndrome ranges from 3% to 19% of pediatric migraine patients, depending on how rigorously the

diagnostic criteria are applied. Hemiplegic migraine is characterized by the appearance of neurological symptoms such as hemiplegia, hemiparesis, aphasia and visual field defects that are followed by the headache. Ophthalmoplegic migraine is an uncommon migraine variant involving oculomotor dysfunction. There is pain behind the eye, but it may be negligible. Patients will complain of blurred or double vision and have ptosis or a dilated pupil that may last long after the pain has resolved. Cyclic vomiting and abdominal migraine, with its episodes of abdominal pain, nausea and vomiting, are also considered part of the spectrum of childhood migraine.

Assessment

A careful history and examination of the child with a severe headache are crucial to the diagnosis of migraine. Acute headaches rarely have serious underlying pathology, but a detailed evaluation is necessary to distinguish the etiology. Nuchal rigidity (rigidity of the back of the neck), altered mental status, neurological abnormalities, increased blood pressure, fever and papilledema signal serious neurological illness and warrant emergent intervention.⁸ Other signs and symptoms of neurological etiology include morning headaches, persistent vomiting, increasing severity, aggravation of headache by coughing, sneezing or exertion, and unresponsiveness to medication. Headaches with these characteristics may have an intracranial etiology.

A detailed history should be obtained; the child should be interviewed alone, if possible. The history should include the duration and onset of the current headache, and the circumstances of the onset; the type and severity of the pain; location of pain and any accompanying symptoms; aggravating factors; factors providing relief; what treatments have been used, what results obtained; and to what extent the child has been incapacitated by the headache.⁸ A history of past headaches should also be obtained, including age of onset, duration of headaches, triggers, family history, effect of sleep on headaches, general health history, allergies and efficacy of past treatments. An assessment of the social and emotional situation of the child should be made. In most cases neurologic imaging is not useful and should be reserved for cases with symptoms suggestive of

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neurologic pathology or where the headache differs significantly from the patient's usual pattern.

Non-pharmacologic treatment

Pediatric migraine is frequently alleviated by a period of sleep. The associated photophobia and phonophobia will benefit from rest in a quiet, darkened room. Application of ice over the painful area is sometimes recommended. Regular meals and sufficient, but not excessive, amounts of sleep are beneficial in preventing migraines. Avoidance of known triggers such as chocolate or cheese is recommended. Much success has been obtained with the use of relaxation and biofeedback techniques in the prevention and treatment of pediatric migraine. Patients with recurrent migraines who have access to instruction in these techniques should be counseled to seek it out.

A study comparing self-hypnosis and propranolol in the management of pediatric migraine was carried out in 33 children aged 6 to 12 years. In this crossover study, patients took placebo, took propranolol at a dose of 3 mg/kg, and then used self-hypnosis for 12 weeks for each treatment. Self-hypnosis was significantly superior to both placebo ($p=0.045$) and propranolol ($p=0.001$) in reducing the mean number of headaches in the treatment period. There was no significant difference between placebo and propranolol in this study. The intensity of headaches was not decreased by any treatment used in this study.¹⁰

Progressive relaxation and vasomotor feedback were compared to pharmacologic prophylaxis with metoprolol in a 1998 study in 43 children aged 8 to 16 years. Children in the metoprolol group received 50 or 100 mg based on weight for 10 weeks, while the two behavioral groups practiced their therapies for six weeks. Both psychological techniques produced significant reductions in the frequency ($p<0.01$ for relaxation, $p<0.05$ for biofeedback) of headaches. Biofeedback produced a significant reduction ($p<0.05$) in the duration of headaches, and relaxation produced a significant reduction ($p<0.05$) in the intensity of headaches. Metoprolol had no significant effect on any parameter.¹¹

Relaxation-response training was evaluated with and without biofeedback in children aged 8 to 12 years. Eighteen children were divided into three groups, one receiving no special training, one trained in relaxation-response alone and one trained in relaxation-response with biofeedback. Over the 15-week course of treatment, the children in both treatment groups had significant reductions in the frequency and total hours per week of headaches, while the children who were not trained in these techniques had no change in either parameter. The authors found no added benefit in combining biofeedback with relaxation-response therapy.¹²

A study of 30 children aged 8 to 18 years old compared self-

generated vasomotor training with and without skin temperature biofeedback. All subjects had diagnoses of migraine or vascular headache. The children were divided into three groups, one of which received no training. After seven weeks of treatment, headache frequency and duration were significantly reduced in both treatment groups compared to the group that had not received training. There was no difference between the two treatment groups initially, but at follow-up 6 months after the conclusion of the treatment period, the group that had received biofeedback in addition to vasomotor training had a larger percentage (80%) of subjects remaining symptom-free than the group that received only the vasomotor training (50%).¹³

Pharmacologic treatment

There are three alternatives in the treatment of acute migraine headache in pediatrics: simple analgesics, analgesics plus antiemetics, and agents that terminate the migraine. There has been little study of drug therapy in pediatric migraine; therefore, recommended doses are most often based on what is recommended for other painful conditions rather than on actual evaluation in clinical trials. Doses of antiemetics are based on those used in other situations.

Ibuprofen and acetaminophen were evaluated in the treatment of pediatric migraine in the home setting. A randomized, double blind, placebo-controlled trial conducted in 88 children aged 4 to 15 years. Patients tried one dose of each drug and placebo for three different headaches and then were asked to indicate which treatment they preferred in a headache diary. In the intent-to-treat analysis, 15 mg/kg acetaminophen was equivalent to 10 mg/kg ibuprofen in relieving pain, and each was about twice as effective as placebo. In patients with moderate or severe headache, ibuprofen was twice as likely as acetaminophen to terminate the headache within two hours.¹⁴

Oral dihydroergotamine was evaluated in a small trial of 12 children with migraine. Doses of 20 mcg/kg and 40 mcg/kg were compared with placebo in a crossover fashion. While more subjects responded to dihydroergotamine than to placebo, the difference did not reach statistical significance. In addition, some patients who responded to the 20 mcg/kg dose did not respond to the 40 mcg/kg dose. The poor oral bioavailability of dihydroergotamine may account for some of the inconsistencies seen in this trial.¹⁵

Sumatriptan nasal spray has been evaluated for the treatment of migraines in patients aged 5 to 12 years. Eight patients used the 20 mg inhaler and two patients used the 5 mg inhaler. Ten patients were instructed in the use of the sumatriptan inhaler and those who had a headache at the time of the initial visit were evaluated for response at that time. Seven of the eight patients who had a headache at the initial visit became headache-free within 45 minutes, half within 30 minutes. Over

the course of the study, the patients treated a total of 57 headaches. One patient had no response to sumatriptan in treating six headaches. All headaches responded to sumatriptan in seven patients and half of the headaches responded in two patients. Overall 47 of 57 headaches (82.5%) responded to sumatriptan. No serious side effects were reported, but three patients reported a persistent bad taste in the mouth.¹⁶

Another study compared sumatriptan nasal spray 20 mg to a placebo nasal spray in crossover fashion in 14 children aged 6 to 10 years. Sumatriptan was significantly superior to placebo in reducing pain intensity ($p=0.031$) and in providing total headache relief ($p=0.016$). Six patients required rescue medication after using placebo, while no patient required rescue medication after using sumatriptan ($p=0.031$). Sumatriptan was significantly superior to placebo in reducing nausea, vomiting, photophobia and phonophobia. Thirteen children preferred sumatriptan.¹⁷

A much larger trial of sumatriptan nasal spray was conducted in 653 adolescents aged 12 to 17 years. The randomized, double-blind, placebo-controlled trial was conducted in patients with a 6-month or longer history of migraine; a single migraine attack was treated with placebo or 5, 10, or 20 mg sumatriptan. Of the 653 patients initially randomized, 147 withdrew from the study after randomization. Most of the withdrawals occurred because the patients did not treat an attack with study medication during the study period. The 10 mg and 20 mg doses of sumatriptan were significantly better than placebo in providing headache relief in the intent-to-treat population at one hour post dose ($p<0.05$), although 41% of patients using placebo reported headache relief at one hour. Significantly more patients in the intent-to-treat population using the 5 mg dose of sumatriptan reported headache relief at two hours post dose compared to those using placebo ($p<0.05$), although here again there was a large placebo response (53%). The difference in headache relief at two hours between the 20 mg sumatriptan group and the placebo group approached but did not reach statistical significance ($p=0.059$). Photophobia and phonophobia were significantly reduced by the 20 mg dose compared to placebo at two hours post dose ($p<0.05$ for each). The most effective dose in 12- to 14-year-olds was 5 mg; the most effective dose in 15- to 17-year-olds was 20 mg.¹⁸

An open-label trial of subcutaneous sumatriptan was conducted in 50 patients aged 6 to 18 years. Patients received 0.06 mg/kg sumatriptan subcutaneously in a neurology clinic. Patients included those who had tension-type headaches in addition to migraines as well as those who had migraines alone. The overall response rate was 78%, with 72% of patients responding in 30 to 60 minutes. The response rate was higher among male patients than among females. Headaches recurred in 6% of patients who had an initial response to sumatriptan. Eighty percent of patients experienced side effects; however, most of

the side effects were minor, such as tingling sensations, pressure sensations, neck stiffness and throat discomfort.¹⁹

Oral sumatriptan was compared to placebo in 23 children aged 8 to 16 years in a randomized, double-blind, placebo-controlled crossover trial. The children received sumatriptan in doses of 50 mg for a body surface area of 0.75-1.5 m² and 100 mg for a body surface area of greater than 1.5 m². In general, children 12 years old and younger received the lower dose and children over 12 received the higher dose. The patients treated one migraine attack with sumatriptan tablets and one attack with placebo. Headache severity was assessed by the patients before treatment, at 30 and 60 minutes after treatment, and hourly thereafter for five hours. The difference between sumatriptan and placebo in the primary endpoint, reduction of pain intensity by 50% by two hours post dose, was not statistically significant. Similarly, there was no statistical significance in the difference between sumatriptan and placebo in complete headache resolution. The dose of sumatriptan administered had no impact on its efficacy.²⁰

There is little information published on the pharmacologic prophylaxis of migraine in children. Current recommendations advocate using many of the same drugs used in adult prophylaxis at doses appropriate for pediatrics. In general, prophylaxis should be considered when migraines are occurring frequently enough to be burdensome or when they are severe and poorly responsive to acute treatment. In addition to the studies described here, studies have also been conducted using trazodone, clonidine, nimodipine and flunarizine in pediatric migraine prophylaxis.

Amitriptyline was evaluated as a prophylactic medication in 192 children who had headaches more often than three times a month. The average patient age was 12 years. The study population included patients who had headaches other than migraine, but the subset of patients with migraine was analyzed. Patients gradually worked up to a daily amitriptyline dose of 1 mg/kg. A positive response to amitriptyline was reported by 84.2% of the patients and the frequency of all types of headaches was significantly reduced ($p<0.001$ compared to initial visit). The duration of headaches other than daily headaches was significantly reduced ($p<0.001$) and the number of school days missed was significantly reduced ($p<0.01$ for daily headaches; $p<0.001$ for other headaches). The severity of headaches was also significantly reduced ($p<0.001$ at the first follow-up visit). When patients with migraine were evaluated separately, the results exactly mirrored those for headaches in general. The authors did not specifically report on side effects but wrote that the drug was "well-tolerated."²¹

A study of 32 children aged 7 to 16 years old evaluated propranolol for migraine prophylaxis in a randomized, double-blind, placebo-controlled crossover study. Doses of propranolol were increased to 60 mg daily for patients weighing less

than 35 kg and 120 mg daily for those weighing over 35 kg, all administered in three divided doses. Each treatment was administered for thirteen weeks, with the first week used to build up to the final dose. Four patients did not complete the study. The average number of migraine attacks was significantly lower during propranolol treatment than during placebo treatment ($p < 0.001$).²²

Propranolol was compared to placebo in 53 children aged 9 to 15 years in a randomized, double-blind, placebo-controlled crossover trial. After taking placebo for four weeks, patients were randomized to take either placebo or propranolol at a dose of 40 mg twice daily for six weeks. At that time, the dose could be increased to three times daily if desired by the investigator. After 6 more weeks, there was a two-week washout period, followed by six weeks of placebo or propranolol 40 mg twice daily. After six weeks, the investigator could again increase the dose to three times daily if desired. In this study, the investigators found no benefit from propranolol; a significant increase in duration of headache occurred during the intervals that the patients were taking propranolol ($p < 0.01$).²³

Forty-four patients with a clinical diagnosis of migraine with or without aura were given divalproex sodium as prophylaxis. The starting dose was 15 mg/kg/day in two divided doses; the dose was gradually increased to a maximum of 45 mg/kg/day until patients were having less than one headache per month. Two patients did not complete the study. A 50% reduction in headache frequency was achieved in 33 patients (78.5%), a 75% reduction in 6 patients (14.2%) and 4 patients (9.5%) were headache-free ($p < 0.05$). Abortive medications were discontinued in 39 patients (92.8%). Twenty-nine patients experienced adverse effects, most often gastrointestinal upset, but also weight gain, dizziness, somnolence and tremor. No patients discontinued divalproex sodium due to adverse effects.²⁴

Conclusions

Pediatric migraine is a common problem that warrants greater attention. There is little information to rely on in deciding which acute and prophylactic treatments are the most effective in children. The treatments that work best for adults may not be best for children. Many of the available studies are weakened by the lack of placebo controls and blinding, so they must be considered more cautiously when weighing the available evidence. As more and better treatments for migraine become available for adults, perhaps some of the benefits of these breakthroughs will improve the treatment of migraine in children. ■

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UWHC Pediatric Migraine Guidelines

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I. Background

Pediatric migraine is a recurrent, acute headache syndrome that occurs in 5%-10% of children. It may occur in children under 5 years old. The prevalence is somewhat higher in boys than in girls until the age of menarche, when the prevalence in girls becomes higher. Typical features of the headache may include throbbing pain; unilateral pain, although frontal or mid-forehead pain is common; accompanying nausea, vomiting and autonomic symptoms; photophobia and/or phonophobia; and visual disturbances. In very young children the headache may be manifested by the child's crying, becoming withdrawn and seeking out a quiet place to sleep.

Treatment is directed at pain relief and relief of nausea and vomiting if necessary. For many patients, a period of sleep will completely relieve the headache. Prophylactic therapies may be considered if migraines are frequent or severe; the goal of prophylactic treatment is at least a 50% reduction in frequency and/or severity of headaches. Complete prevention of headaches may not be possible.

II. Evaluation

The initial evaluation of a child who presents with an acute severe headache or who has a history of headaches and presents with an acute exacerbation includes assessment for nuchal rigidity, focal neurologic signs or an altered level of consciousness, indications that an infection, intracranial hemorrhage or mass might be responsible for the headache. Other indicators of acute neurological problems include fever, elevated blood pressure, papilledema and retinal hemorrhages. A general physical examination should follow. A social and psychological assessment should be performed to determine whether there are stressful elements in the child's environment that influence headaches. A private interview with the child should be conducted to determine whether there is physical, emotional or sexual abuse present in the child's life.

A detailed history of the headache should be obtained, including the circumstances and onset of the pain, its character and severity, its location, accompanying symptoms, precipitating factors, relief measures and degree of impairment. Particular attention should be paid to headaches that are unusually intense compared to the patient's usual headaches, headaches that are unresponsive to treatment, headaches that occur in the morning with persistent vomiting and recurrent localized headaches.

III. Non-Pharmacologic Measures

- A. Move patient to a dark, quiet room
- B. Encourage patient to rest and sleep, if possible
- C. Rehydrate if vomiting has been frequent or if dehydration is possible
- D. Apply ice over the painful area
- E. Biofeedback and relaxation techniques are highly effective in the treatment of pediatric migraine, alone or in combination with pharmacologic treatment. Training in these methods should be provided to children with recurrent migraine as soon as possible after the diagnosis is made.

IV. Analgesic Drug Therapies

- A. Initial treatment of mild-moderate migraine
 - 1.0 Acetaminophen 10-15 mg/kg PO or PR q 4 hours; maximum 4000 mg/day
 - contraindicated in hypersensitivity
 - use with caution in liver disease or for >24 hours if no PO intake
 - 2.0 Ibuprofen 5-10 mg/kg PO q 6 hours; maximum 3200 mg/day
 - contraindicated in hypersensitivity to ibuprofen or any NSAID
 - use with caution in renal or liver disease, history of GI bleeding or coagulation defects
 - may cause GI upset

- 3.0 Naproxen sodium 2.5-5 mg/kg PO q 12 hours; maximum 1000 mg/day
- contraindicated in hypersensitivity to naproxen, aspirin, or any NSAID
 - use with caution in renal or liver disease, history of GI bleeding or coagulation defects
 - may cause GI upset
- B. Treatment of moderate-more severe migraine
- 1.0 Oxycodone with acetaminophen 0.1-0.15 mg/kg of oxycodone component plus no more than 10-15 mg/kg acetaminophen po q 4 hours; maximum 10 mg oxycodone component/dose and 4000 mg acetaminophen/day
- contraindicated in hypersensitivity to either component
 - use with caution in acute abdominal conditions, Addison's disease, concomitant use of other CNS depressants, concomitant use of anticholinergic agents, head injuries, increased intracranial pressure, hypothyroidism, COPD, cor pulmonale, hypoxia, hypercapnia, pre-existing respiratory depression, hypothyroidism, prostatic hypertrophy, urethral stricture, severe renal or hepatic impairment or previous sensitivity to other opioids
 - may cause sedation, GI upset, constipation or respiratory depression (especially when used with other CNS depressants)
- 2.0 Ketorolac 0.5 mg/kg IV q 6 hours; maximum 30 mg/dose
- contraindicated in hypersensitivity; complete or partial syndrome of nasal polyps, angioedema and bronchospastic reaction to aspirin or other NSAIDs; history of peptic ulcer disease, GI bleed or perforations; advanced renal impairment or risk of renal impairment due to volume depletion; labor, delivery and lactation; patients receiving other NSAIDs; concurrent use with probenecid; suspected or confirmed cerebrovascular bleeding, hemorrhagic diathesis, incomplete hemostasis and patients at a high risk of bleeding; patients at high risk of bleeding and total duration of therapy should not exceed 5 days
 - use with caution in patients with hypertension, cardiac conditions aggravated by fluid retention and edema, a history of coagulation defects, therapeutic doses of anticoagulants and impaired liver function or a history of liver disease
 - causes dizziness and GI upset; may precipitate acute renal failure in dehydrated patients; IM injection may be painful and cause bruising
 - oral ketorolac is a nonformulary item at UWHC

V. Antiemetic Drug Therapies

Use in addition to analgesic or abortive therapy if patient is nauseated or vomiting. Choose IV or rectal route if the patient is unable to take oral medication due to vomiting. Dolasetron and other 5HT₃ antagonists generally have the fewest side effects but are much more costly than other antiemetics. Metoclopramide is generally a good, inexpensive first choice although dystonic reactions are possible with this drug. Prochlorperazine and promethazine are inexpensive and effective but have many side effects.

- A. Metoclopramide 0.1-0.2 mg/kg PO or IV; maximum 20 mg/dose
- contraindicated in epilepsy; GI hemorrhage, obstruction or perforation; pheochromocytoma or hypersensitivity to metoclopramide
 - dystonic reactions may occur with metoclopramide; may be prevented by pretreatment with diphenhydramine 1-2 mg/kg IV or PO; maximum 50-100 mg/dose
 - typically causes drowsiness
- B. Prochlorperazine 0.05-0.1 mg/kg PO or PR; 0.2 mg/kg IM; maximum 10 mg/dose
- contraindicated in hypersensitivity to phenothiazines and in children under 20 pounds or under 2 years old
 - use with caution in children with dehydration or electrolyte imbalances
 - dystonias may occur with prochlorperazine
 - divide rectal suppositories lengthwise to obtain partial doses
- C. Dolasetron 1.2 mg/kg PO or 0.35 mg/kg IV; maximum 100 mg PO or 25 mg IV
- contraindicated in hypersensitivity
 - use with caution in patients at risk for prolongation of QTc conduction intervals
 - may cause drowsiness or dizziness
 - may exacerbate headache
- D. Promethazine 1 mg/kg up to 25 mg PR or 0.5 mg/kg up to 25 mg IV
- contraindicated in children under 2 years old, subcutaneous or intraarterial injections, lower respiratory tract

- symptoms including asthma, comatose states and concomitantly with large amounts of CNS depressants
- use with caution in patients with allergy to metabisulfite, in pregnancy and lactation, in dehydrated children, in hepatic disease or Reye's syndrome, narrow angle glaucoma, stenosing peptic ulcer, bladder neck obstruction, pyloroduodenal obstruction, bone marrow depression, history of seizures, history of sleep apnea or cardiovascular disease.
- may cause hallucinations in high doses; causes sedation; may cause respiratory depression when given with other CNS depressants
- divide rectal suppositories lengthwise to get partial doses
- rectal suppositories are a nonformulary item at UWHC

VI. Abortive Drug Therapies

Abortive therapy with triptans is the preferred treatment of migraine in adults; as yet, there is little information on the use of these drugs in children. Use of these drugs in adolescents has been studied more extensively and is as effective as in adults.

- A. Sumatriptan 0.06 mg/kg subcutaneously or 20 mg intranasally; maximum 6 mg subcutaneously
 - contraindicated in hypersensitivity, in hemiplegic or basilar migraine, within 2 weeks of discontinuing a MAOI, within 24 hours of using an ergot-containing preparation, in uncontrolled hypertension, seizures, ischemic heart disease, history of myocardial infarction or Prinzmetal's angina
 - use with caution in renal or hepatic insufficiency, in patients with risk factors for atherosclerosis, in patients not previously diagnosed with migraine or in patients with an atypical migraine
 - the 20 mg nasal spray has been used in children as young as 6 years
 - oral tablets have yielded inconsistent results in children
- B. Naratriptan 2.5 mg PO (>12 years old)
 - contraindicated in hypersensitivity to naratriptan, use of ergot-containing product or other 5HT₁ agonist within 24 hours, hemiplegic or basilar migraine, severe renal or hepatic impairment, uncontrolled hypertension, underlying cardiovascular disease or a history or symptoms of ischemic heart disease
 - use with caution in moderate renal or hepatic impairment
 - longer duration of action than sumatriptan, but longer time to onset
- C. Dihydroergotamine (DHE) 0.1-0.25 mg IV ; may repeat dose once in one hour ; maximum dose 6 mg/week
 - use in severe, prolonged migraine unresponsive to other treatments
 - administer an antiemetic at the same time
 - limit use to older children and adolescents
 - contraindicated in hypersensitivity to DHE, peripheral vascular disease, coronary heart disease, severe hepatic or renal impairment, hemiplegic or basilar migraine, prolonged hypotension, myocardial infarction, sepsis, pregnancy or lactation, coadministration with other vasopressors and administration within 24 hours of other ergot-containing preparations or 5HT₁ agonists ("triptans")
 - may cause nausea, vomiting, vasospasm

VII. Migraine Prophylaxis – Non-Pharmacologic Measures

- A. Keep a headache diary to help identify triggers and high-risk periods
- B. Avoid triggers as much as is possible
- C. Get adequate rest
- D. Eat regular meals
- E. Biofeedback and relaxation are often extremely helpful as prophylaxis

VIII. Migraine Prophylaxis – Drug Therapies

Frequent migraines or migraines that are poorly responsive to treatment warrant evaluation by a pediatric neurologist. The information presented here on prophylaxis is not exhaustive and is intended to provide basic information on the most common therapies used.

Migraine prophylaxis requires commitment on the part of the patient and the physician. Allow an adequate (2-3 month) trial of a prophylactic drug before deciding it is not working. Start at low doses and titrate upwards based on tolerability to an adequate dose.

- A. Propranolol 1-3 mg/kg/day PO up to 240 mg/day given in divided doses twice daily or as a sustained-release formulation once daily

- start at a low dose and increase slowly
 - contraindicated in hypersensitivity, asthma, cardiogenic shock, second and third degree AV block, severe sinus bradycardia and overt cardiac failure
 - use with caution in renal and hepatic disease, congestive heart failure, diabetes, hyperthyroidism and myasthenic conditions
 - withdraw from drug gradually, over 1-2 weeks
- B. Amitriptyline <12 years old: 10-25 mg PO hs; >12 years old: 20-25 mg PO hs; may increase to 75 mg gradually over several weeks or months
- contraindicated in hypersensitivity, concomitant MAOI use and in the acute recovery phase following myocardial infarction
 - use with caution in patients with seizures, urinary retention, cardiovascular disorders, increased intraocular pressure, hyperthyroidism, pregnancy, schizophrenia, manic depression and hepatic impairment
 - dry mouth, constipation and sedation are common side effects
- C. Divalproex sodium 10-30 mg/kg/day PO up to 1500 mg/day; give doses over 250 mg divided BID or as extended-release tablet once daily
- contraindicated in hypersensitivity and hepatic disease or dysfunction
 - use with caution in pancreatitis or with other CNS depressants
 - may cause sedation, weight gain, thrombocytopenia
- D. Cyproheptadine 2-6 years old: 2 mg PO 2-3 x/day; 7-14 years old: 4 mg PO 2-3x/day
- contraindicated in hypersensitivity, concomitant MAOI therapy, angle-closure glaucoma, stenosing peptic ulcer, symptomatic peptic ulcer, bladder neck obstruction and pyloroduodenal obstruction
 - use with caution with other CNS depressants, in patients with cardiovascular disease, increased intraocular pressure, asthma, hyperthyroidism and hypertension
 - may cause drowsiness, dry mouth, weight gain

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