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# The Child With Migraine

More often than not the child who presents with recurrent or chronic headaches will be experiencing migraines. Pediatric migraine is very common; in fact, it is one of the top five health problems for

children. General pediatricians treat the majority of these children, up to 90%. There are not enough pediatric neurologists in the United States to take care of all of these children. For example, given the prevalence rate of 10%, an estimated 60,000 children and adolescents experience migraine out of the 2.4 million people in the Cincinnati draw area for my institution. Obviously, they can-

not all be referred to a specialist.

The most important thing for you to do is to rule out secondary headaches. Differentiate primary headaches (such as migraine and tension headaches) from secondary ones, being skeptical of the secondary presentations. If a secondary etiology is suspected and the headaches do not resolve, then reassess, but the headaches may be primary ones.

Ask patients and parents about headache symptoms because often the symptoms are initially missed. Standardized criteria such as the American Academy of Neurology practice parameters on the treatment of migraine headache in children and adolescents can guide your diagnosis and management (Neurology 2004;63:2215-24). If the clinical picture does not fit these criteria, consider further evaluation of the child.

After your differential diagnosis, perform a complete neurologic examination. If findings are abnormal on the neurologic exam, consider an MRI. Such imaging also may be warranted for children with exclusively occipital headaches, if they experience a crescendo or abrupt change in headaches, or if they lack a relevant family history.

Almost all other tests are less useful and do not help prior to referral to a pediatric neurologist. We do not need EEGs, sinus x-rays, or CT exams, which have lots of unnecessary radiation. We routinely check riboflavin and coenzyme Q10 levels, but this may be beyond the level of general pediatricians.

Referral to a specialist is appropriate when the above strategies are not working and if the headaches do not improve. Also refer if a child has chronic daily headaches (defined as 15 or more days per month), if a child is missing a lot of school or other activities of daily living, and/or if the history and diagnosis do not seem to fit the presentation.

Optimal treatment is a standardized strategy that incorporates acute and preventive pharmacologic strategies, as well as biobehavioral treatments.

Appropriate NSAID use, for example, can aid a child with an acute presentation. For example, prescribe 10 mg/kg of ibuprofen on onset, and do not exceed three dosages per week. In addition, be familiar with at least one triptan at appropriate dosing (an adult dose for teenagers).

Also be comfortable with at least one age-appropriate, preventive agent. Amitriptyline is the easiest to use. The recommended dosage regimen is 1 mg/kg titrated up slowly (over a period of 8-10 weeks) for about 2-3 months at full dose to allow sufficient time for clinical effect. I also advise against the use of cyproheptadine for teenagers with migraines because of the appetite effect.

Adequate fluid intake without caffeine, exercise at least three to four times per week, and sufficient regular sleep (8-9 hours, for example) are important components of biobehavioral treatment. In addition, educate patients and parents about the importance of a healthy, balanced diet. Instruct patients not to skip meals. We do not recommend avoidance of particular foods, and the evidence supports this stance. It is more important to make healthy food choices. ■

### BRIEF SUMMARY

**ALTABAX™ (retapamulin ointment), 1%**  
The following is a brief summary only; see full prescribing information for complete product information.

#### 4 CONTRAINDICATIONS

None.

#### 5 WARNINGS AND PRECAUTIONS

##### 5.1 Local Irritation

In the event of sensitization or severe local irritation from ALTABAX, usage should be discontinued, the ointment wiped off, and appropriate alternative therapy for the infection instituted [See Patient Counseling Information (17)].

##### 5.2 Not for Systemic or Mucosal Use

ALTABAX is not intended for ingestion or for oral, intranasal, ophthalmic, or intravaginal use. ALTABAX has not been evaluated for use on mucosal surfaces [See Patient Counseling Information (17)].

##### 5.3 Potential for Microbial Overgrowth

The use of antibiotics may promote the selection of nonsusceptible organisms. Should superinfection occur during therapy, appropriate measures should be taken.

Prescribing ALTABAX in the absence of a proven or strongly suspected bacterial infection is unlikely to provide benefit to the patient and increases the risk of the development of drug-resistant bacteria.

#### 6 ADVERSE REACTIONS

##### 6.1 Clinical Studies Experience

The safety profile of ALTABAX was assessed in 2,115 adult and pediatric patients ≥9 months who used at least one dose from a 5-day, twice a day regimen of retapamulin ointment. Control groups included 819 adult and pediatric patients who used at least one dose of the active control (oral cephalixin), 172 patients who used an active topical comparator (not available in the US), and 71 patients who used placebo.

Adverse events rated by investigators as drug-related occurred in 5.5% (116/2,115) of patients treated with retapamulin ointment, 6.6% (54/819) of patients receiving cephalixin, and 2.8% (2/71) of patients receiving placebo. The most common drug-related adverse events (≥1% of patients) were application site irritation (1.4%) in the retapamulin group, diarrhea (1.7%) in the cephalixin group, and application site pruritus (1.4%) and application site paresthesia (1.4%) in the placebo group.

Because clinical studies are conducted under varying conditions, adverse reaction rates observed in the clinical studies of a drug cannot be directly compared to rates in the clinical studies of another drug and may not reflect the rates observed in practice. The adverse reaction information from the clinical studies does, however, provide a basis for identifying the adverse events that appear to be related to drug use and for approximating rates.

**Adults:** The adverse events, regardless of attribution, reported in at least 1% of adults (18 years of age and older) who received

ALTABAX are listed in Table 1.

**Table 1. Adverse Events Reported by ≥1% of Adult Patients Treated With ALTABAX in Phase 3 Clinical Studies**

Adverse Event	ALTABAX N=1527 %	Cephalixin N=698 %
Headache	2.0	2.0
Application site irritation	1.6	<1.0
Diarrhea	1.4	2.3
Nausea	1.2	1.9
Nasopharyngitis	1.2	<1.0
Creatinine phosphokinase increased	<1.0	1.0

**Pediatrics:** The adverse events, regardless of attribution, reported in at least 1% of pediatric patients aged 9 months to 17 years who received ALTABAX are listed in Table 2.

**Table 2. Adverse Events Reported by ≥1% in Pediatric Patients Aged 9 Months to 17 Years Treated With ALTABAX in Phase 3 Clinical Studies**

Adverse Event	ALTABAX N=588 %	Cephalixin N=121 %	Placebo N=64 %
Application site pruritus	1.9	0	0
Diarrhea	1.7	5.0	0
Nasopharyngitis	1.5	1.7	0
Pruritus	1.5	1.0	1.6
Eczema	1.0	0	0
Headache	1.2	1.7	0
Pyrexia	1.2	<1.0	1.6

**Other Adverse Events:** Application site pain, erythema, and contact dermatitis were reported in less than 1% of patients in clinical studies.

#### 7 DRUG INTERACTIONS

Co-administration of oral ketoconazole 200 mg twice daily increased retapamulin geometric mean AUC<sub>0-24</sub> and C<sub>max</sub> by 81% after topical application of retapamulin ointment, 1% on the abraded skin of healthy adult males. Due to low systemic exposure to retapamulin following topical application in patients, dosage adjustments for retapamulin are unnecessary when co-administered with CYP3A4 inhibitors, such as ketoconazole. Based on in vitro P450 inhibition studies and the low systemic exposure observed following topical application of ALTABAX, retapamulin is unlikely to affect the metabolism of other P450 substrates.

The effect of concurrent application of ALTABAX and other topical products to the same area of skin has not been studied.

#### 8 USE IN SPECIFIC POPULATIONS

##### 8.1 Pregnancy

**Pregnancy Category B.** Effects on embryo-fetal development were assessed in

pregnant rats given 50, 150, or 450 mg/kg/day by oral gavage on days 6 to 17 postcoitus. Maternal toxicity (decreased body weight gain and food consumption) and developmental toxicity (decreased fetal body weight and delayed skeletal ossification) were evident at doses ≥150 mg/kg/day. There were no treatment-related malformations observed in fetal rats.

Retapamulin was given as a continuous intravenous infusion to pregnant rabbits at dosages of 2.4, 7.2, or 24 mg/kg/day from day 7 to 19 of gestation. Maternal toxicity (decreased body weight gain, food consumption, and abortions) was demonstrated at dosages ≥7.2 mg/kg/day (8-fold the estimated maximum achievable human exposure, based on AUC, at 7.2 mg/kg/day). There was no treatment-related effect on embryo-fetal development.

There are no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, ALTABAX should be used in pregnancy only when the potential benefits outweigh the potential risk.

##### 8.3 Nursing Mothers

It is not known whether retapamulin is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when ALTABAX is administered to a nursing woman. The safe use of retapamulin during breast-feeding has not been established.

##### 8.4 Pediatric Use

The safety and effectiveness of ALTABAX in the treatment of impetigo have been established in pediatric patients 9 months to 17 years of age. Use of ALTABAX in pediatric patients is supported by evidence from adequate and well-controlled studies of ALTABAX in which 588 pediatric patients received at least one dose of retapamulin ointment, 1% [See Adverse Reactions (6), Clinical Studies (14)]. The magnitude of efficacy and the safety profile of ALTABAX in pediatric patients 9 months and older were similar to those in adults.

The safety and effectiveness of ALTABAX in pediatric patients younger than 9 months of age have not been established.

##### 8.5 Geriatric Use

Of the total number of patients in the adequate and well-controlled studies of ALTABAX, 234 patients were 65 years of age and older, of whom 114 patients were 75 years of age and older. No overall differences in effectiveness or safety were observed between these patients and younger adult patients.

#### 10 OVERDOSAGE

Overdosage with ALTABAX has not been reported. Any signs or symptoms of overdose, either topically or by accidental ingestion, should be treated symptomatically consistent with good clinical practice.

There is no known antidote for overdoses of ALTABAX.

#### 13 NONCLINICAL TOXICOLOGY

##### 13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

Long-term studies in animals to evaluate carcinogenic potential have not been conducted with retapamulin.

Retapamulin showed no genotoxicity when evaluated in vitro for gene mutation and/or chromosomal effects in the mouse lymphoma cell assay, in cultured human peripheral blood lymphocytes, or when evaluated in vivo in a rat micronucleus test.

No evidence of impaired fertility was found in male or female rats given retapamulin 50, 150, or 450 mg/kg/day orally.

##### 17 PATIENT COUNSELING INFORMATION

Patients using ALTABAX and/or their guardians should receive the following information and instructions:

- Use ALTABAX as directed by the healthcare practitioner. As with any topical medication, patients and caregivers should wash their hands after application if the hands are not the area for treatment.

- ALTABAX is for external use only. Do not swallow ALTABAX or use it in the eyes, on the mouth or lips, inside the nose, or inside the female genital area.

- The treated area may be covered by a sterile bandage or gauze dressing, if desired. This may also be helpful for infants and young children who accidentally touch or lick the lesion site. A bandage will protect the treated area and avoid accidental transfer of ointment to the eyes or other areas.

- Use the medication for the full time recommended by the healthcare practitioner, even though symptoms may have improved.

- Notify the healthcare practitioner if there is no improvement in symptoms within 3 to 4 days after starting use of ALTABAX.

- ALTABAX may cause reactions at the site of application of the ointment. Inform the healthcare practitioner if the area of application worsens in irritation, redness, itching, burning, swelling, blistering, or oozing.

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Revised: April 2007

ALX-1BR5

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Printed in USA. ABX325R0 April 2009

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