

Translating Best Evidence into Best Care

EDITOR'S NOTE: Journals reviewed for this issue: *Archives of Disease in Childhood*, *Archives of Pediatrics and Adolescent Medicine*, *British Medical Journal*, *Journal of the American Medical Association*, *The Journal of Pediatrics*, *The Lancet*, *New England Journal of Medicine*, *Pediatric Infectious Diseases Journal*, and *Pediatrics*. Gurpreet K. Rana, B.Sc., M.L.I.S, Taubman Medical Library, University of Michigan, contributed to the review and selection of this month's abstracts.

—John G. Frohna, MD, MPH

Swimming lessons may reduce risk of drowning in young children

Brenner RA, Saluja Taneja G, Haynie DL, Trumble AC, Qian C, Klinger RM, et al. Association between swimming lessons and drowning in childhood: A case-control study. *Arch Pediatr Adolesc Med* 2009;163:203-10.

Question Among healthy children aged 1-19 years, does participation in formal swimming lessons versus no participation reduce the risk of death due to unintentional drowning?

Design Population-based case-control study.

Setting Multiple counties across 6 states in the United States.

Participants 88 cases of unintentional drowning deaths detected by medical examiner report (patients aged 1-19 years), 213 matched controls (at least 2 controls per case). Controls were matched for age, sex and county of residence.

Outcomes Death due to unintentional drowning.

Main Results For children in the 1-4 year age group, exposure to formal swimming lessons was associated with an 88% reduction in the risk of drowning (adjusted OR 0.12; 95% CI 0.01-0.97). This risk calculation was adjusted for the potential confounders of parental education level, child risk taking behavior and race. For children in the 5-19 year age group, exposure to formal swim lessons was associated with a 64% reduction in risk of drowning, but this association was not statistically significant (adjusted OR 0.36; 95% CI 0.09-1.51). Exposure to informal swim instruction was not associated with a reduction in risk of drowning for either age group.

Conclusions Participation in formal swimming lessons is associated with a reduction in the risk of unintentional drowning death for children 1-4 years of age. The magnitude of the risk reduction is unclear as the estimation of risk reduction is very imprecise in the current study.

Commentary As the second leading cause of unintentional death among the pediatric population, drowning continues to be a major cause of childhood mortality. Little is known about the effectiveness of many drowning prevention strategies, including swim lessons. As a result, the role of swimming lessons as a tool to prevent drowning in young children has been controversial. The current AAP policy statements on drowning prevention and on swimming programs for young children state, "children are generally not developmentally ready for swimming lessons until after their 4th birthday."^{1,2} The supporting technical report states,

"there are no data to show that swimming lessons actually decrease the risk of drowning."³ This study by Brenner et al provides just such data. The study is limited by the small sample size, which resulted in wide confidence intervals and thus did not allow a precise estimate of risk reduction. The study may also be limited by participation bias. Of the possible 146 case families contacted for participation in the study, 58 (40%) chose not to participate in the study. The authors present data that participants and non-participants were similar in most characteristics. However, data on the exposure variable of swimming lessons was missing from almost half of the non-participants, so it is possible that non-participants differed significantly on this critical characteristic from those who chose to participate in the study. Recommendations against swim lessons for young children are based partly on the theory that early exposure to water may increase the risk of drowning by decreasing a child's fear of water. The current study found no evidence to suggest that early participation in swim lessons increased a child's risk of drowning. Larger studies are needed to more clearly define the relationship between swimming lessons and drowning risk for the pediatric population. Strong evidence is necessary to better formulate changes in policy that will advance drowning prevention efforts.

Gwen McIntosh, MD, MPH

University of Wisconsin
American Family Children's Hospital
Madison, Wisconsin

References

1. American Academy of Pediatrics. Policy Statement: Prevention of Drowning in Infants, Children, and Adolescents. *Pediatrics* 2003;112:437-9.
2. American Academy of Pediatrics. Swimming Programs for Infants and Toddlers. *Pediatrics* 2000;105:868-70.
3. American Academy of Pediatrics. Technical Report: Prevention of Drowning in Infants, Children and Adolescents. *Pediatrics* 2003;112:440-5.

Topiramate is effective for migraine prophylaxis in children

Lewis D, Winner P, Saper J, Ness S, Polverejan E, Wang S, et al. Randomized, double-blind, placebo-controlled study

to evaluate the efficacy and safety of topiramate for migraine prevention in pediatric subjects 12 to 17 years of age. *Pediatrics* 2009;123:924-34.

Question Among adolescents with a history of migraines, is topiramate (compared with placebo) effective and safe for prophylaxis of migraines?

Design Randomized, controlled trial.

Setting Multi-center study, both in the US and outside the US.

Participants 106 adolescents (12–17 years of age) with a \geq 6-month history of migraine.

Intervention 16 weeks of daily treatment with topiramate (50 or 100 mg/day) or placebo.

Outcomes Percent reduction in monthly migraine attacks, with the use of the 48-hour rule, from the prospective baseline period to the last 12 weeks of the double-blind phase. The 48-hour rule defined a single migraine episode as all recurrences of migraine symptoms within 48 hours after onset. Secondary efficacy measures included the reduction from baseline in the monthly migraine day rate and the 50% responder rate, safety, and tolerability.

Main Results A total of 29 (83%) of 35 subjects treated with topiramate at 50 mg/day, 30 (86%) of 35 subjects treated with topiramate at 100 mg/day, and 26 (79.0%) of 33 placebo-treated subjects completed double-blind treatment. Topiramate at 100 mg/day, but not 50 mg/day, resulted in a statistically significant reduction in the monthly migraine attack rate from baseline versus placebo (median: 72% vs 44%) during the last 12 weeks of double-blind treatment. Topiramate at 100 mg/day, but not 50 mg/day, also resulted in a statistically significant reduction in the monthly migraine day rate from baseline versus placebo. The responder rate favored topiramate at 100 mg/day (83% vs 45% for placebo). Upper respiratory tract infection, paresthesia, and dizziness occurred more commonly in the topiramate groups than in the placebo group.

Conclusions The 100 mg/day topiramate group demonstrated efficacy in the prevention of migraine in pediatric subjects. Overall, topiramate treatment was safe and well tolerated.

Commentary Most childhood migraine patients will have only one or two migraine headaches a month. When the frequency is more than weekly, the use of a migraine preventative is considered. Headache doctors feel that the preventatives are successful if they can reduce the frequency of headaches by 50%. Sometimes the severity of the headaches is reduced as well. This study demonstrates that topiramate is an effective migraine preventative in teenagers, and secondly, that low dosages of topiramate are no more effective than placebo, and one needs to find an appropriate dose (100 mg a day) for efficacy. Based on my personal referral-based experience, I think the latter finding is the critical point for our practice. Many patients rarely get to 100 mg a day before coming to see me as a headache specialist. As pediatricians, I do wonder if we have a tendency to inadequately

dose pain medications for our patients. There are, however, concerns that the paper did not address. A commonly associated side effect of topiramate is problems with word finding and difficulty concentrating. In the references quoted in the Lewis et al paper, these adverse effects were noted in over 10% of adult patients. Unfortunately this current study adds no insight as to the frequency in which these side effects occur in teens. An additional challenge for the field of headache medicine is to determine which of the preventative medications is best for the teenage or preteen patient. Is topiramate more efficacious than amitriptyline, propranolol, or cyproheptadine? Which medication is the most cost effective? The price of a one month supply of amitriptyline is \$5, whereas the brand name version of topiramate (Topamax) is over \$200 per month. Fortunately, a generic version of topiramate is recently available, which is much lower in cost.

Kenneth J. Mack, MD, PhD
Mayo Clinic
Rochester, Minnesota

Primary care hearing screening is of limited utility

Halloran DR, Hardin JM, Wall TC. Validity of pure-tone hearing screening at well-child visits. *Arch Pediatr Adolesc Med* 2009;163:158-63.

Question Among children, how sensitive and specific is pure-tone audiometry hearing screening in the primary care setting?

Design Prospective cohort study.

Setting Eight academic and private pediatric practices in Alabama.

Participants A subset of children from a convenience sample of 1061 children between 3 and 19 years of age were screened for hearing loss using pure-tone audiometry.

Intervention Formal audiologic evaluations (gold standard) for those children referred by their primary care physician (28 children) and for a random sample of children not referred (102 children).

Outcomes Audiologic evaluations.

Main Results A total of 28 children were referred to an audiologist for formal hearing testing after pure-tone audiometry screening during a well-child visit, at which 25 children did not pass the initial screening and 3 could not complete the screening. Of the 25 children, only 7 were evaluated by an audiologist, for a follow-up rate of 25%. One child was diagnosed as having hearing loss. Formal audiologic assessment was also performed on a random sample of 102 children who were not referred to the audiologist. For the random sample, hearing loss was identified in 2 of 76 (3%) children who passed and 1 of 16 (6%) children who did not pass pure tone audiometry screening. The sensitivity and specificity of pure-tone audiometry were 50% and 78%, respectively (positive likelihood ratio (LR) = 1.8, negative LR = 0.64).