

ID CONSULT

Watch Out for Animal Bites

It's springtime, and that means you'll be seeing more children in your office with animal bites. Are you up to date on the latest treatment guidelines?

One of our community practitioners recently told me that he estimated that in the summer, at least once a week, they fielded a phone call or saw a child with an animal bite injury.

Most such injuries are minor, and usually inflicted by the family pet (dogs 80% of the time), but a recent review in our institution suggested that for children who come to the emergency department (ED) following an animal bite, nearly 7% have a serious injury resulting in hospitalization.

Nationally, it is estimated that millions of bites occur each year, and approximately 1% of all ED visits by children are related to animal bite injuries, so this is a substantial number of children. Practitioners should ensure that they have a standardized practice for caring for such children.

Ricky Ogden, a PharmD in our emergency department, presented a poster at the Infectious Diseases Society of America meeting in 2009 in Philadelphia detailing the epidemiology of animal bite injuries seen in our children's hospital ED from 2005 to 2008. He along with my ID colleagues reviewed a randomly selected subset of 400 patients; some of the in-

teresting findings included that encounters occurred most often in April, May, and June, with Sunday being the most common day for an ED visit. Injuries to the face (50.7%) topped the list, and dogs (84%) were the most likely culprits.



BY MARY ANNE JACKSON, M.D.

In looking at animal bite prophylaxis, we were surprised to find that most prescriptions were given for an inappropriately long duration (7-10 days rather than the 2- to 3-day recommendation). If our experience is typical, this is a significant issue. Given that there are about 4.7 million bite wounds every year, that is a lot of unnecessary antibiotics.

Provision of care for the child with an animal bite is well outlined in the Red Book, but careful attention to all steps may be overlooked, particularly if the child is not cared for in his/her medical home or by a pediatric provider.

Documentation of the child's age, underlying diseases, and the bite encounter (animal, circumstances, and time of injury before health care provider visit) is key. In young infants or immunocompromised hosts, the risk of infection and serious outcome associated with animal bites increases. Wounds that are fresh (less than 12 hours old) and superficial require nothing more than cleansing and assessment of the need for a tetanus shot.

Assuming the child was previously healthy and is medically stable, your first

order of business is to assess and characterize the wound and to provide cleansing, irrigation, and debridement. In the case of penetrating trauma, consider the possibility of occult fracture or damage to tendons or joints. For children with extensive wounds, surgical consultation may be necessary for certain types of hand injuries (potential compartment syndromes or artery, tendon, or ligament injuries) or in the case of cranial injuries.

The assessment of tetanus immunization status (and the need for rabies vaccine/immunoglobulin) is important; a notation that vaccines are "up to date" is not sufficient. We have noted that in children attending urgent care or walk-in retail clinics, the documentation of vaccine status is often overlooked or parents are simply asked if vaccines are "up to date." This is an instance when it is particularly important to document the precise date when the last tetanus-containing vaccine was given in order to decide whether an additional dose of vaccine is necessary.

The decision to offer antibiotic prophylaxis in the child with an animal bite injury is guided by the assessment of several key pieces of information. You need to know when to initiate therapy, the correct drug to administer (amoxicillin-clavulanate), and the correct duration of therapy (2-3 days). For those with mild injuries and superficial abrasions, prophylaxis is not indicated. Wounds associated with devitalized tissue—especially crush injuries, puncture wounds, and

bites to the face, hands or feet, or genitals—have a greater risk of complications, including infections.

For the child with an overtly infected wound, treatment is 10 days (and in those with wounds involving tendons, joints, or other deeper tissues, intravenous therapy should be utilized). The most common infecting organism with both dog and cat bites has always been *Pasteurella multocida*, but *Staphylococcus aureus*, *Eikenella corrodens*, *Capnocytophaga* species, some anaerobes, and some gram-negative organisms have been reported.

It is interesting to note that among infected wounds at our hospital, we found no methicillin-resistant *Staphylococcus aureus* despite that 70% of the children we see with skin abscesses (and we see a lot) are caused by this pathogen. For now, we are still recommending amoxicillin-clavulanate, but of course, culture the draining wound and carefully follow up. For those with true penicillin allergy, the combination of clindamycin plus trimethoprim-sulfamethoxazole can be used for non-reptile animal and human bites.

Stay tuned and enjoy the springtime weather and all of the fun it brings with it.

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LDH Levels May Help to Determine Bronchiolitis Severity

BY JEFF EVANS

The concentration of lactate dehydrogenase in nasal wash may be a useful clinical biochemical marker of the severity of bronchiolitis in children and help to determine their need for hospitalization, the results of a retrospective analysis suggest.

Dr. Federico R. Laham and his colleagues at Baylor College of Medicine, Houston, found that bronchiolitic children with lower lactate dehydrogenase (LDH) levels in their nasal wash were significantly more likely to leave the emergency department without being hospitalized and to have a shorter duration of oxygen supplementation or no need for it than were children who had higher LDH levels.

"Currently the presence of hypoxia, significant respiratory distress, and clinical judgment are the main consideration[s] for determining the need to hospitalize a child with bronchiolitis. Having a validated biochemical

VITALS

Major Finding: A nasal wash lactate dehydrogenase level reaching 365 U/mL or higher in children with bronchiolitis was associated with a significant 81% reduction in the need for hospital admission.

Data Source: A retrospective analysis of prospectively collected nasal wash samples from 98 children with bronchiolitis.

Disclosures: The study was funded by a grant from the National Institutes of Health Baylor Research Training Program for Pediatricians and a Viral Respiratory Pathogen Research Unit Contract. Dr. Laham and his associates said they had no relevant financial conflicts to disclose.

marker predictive for hospitalization can provide another objective parameter to the physician, and would be valuable in difficult-to-assess cases," Dr. Laham and his associates wrote (*Pediatrics* 2010;125:e225-33).

The study represents the first known analysis of lactate dehydrogenase levels in nasal wash, according to the investigators. They identified viruses, tested for cytokines and chemokines, and measured levels of apoptosis and LDH in nasal wash specimens from 98 children who had participated in an earlier study of

bronchiolitis. They also measured serum LDH levels. These 98 patients had a median age of 5.6 months and a median duration of illness of 4 days at the time of their presentation to the ED.

Respiratory syncytial virus (RSV) was identified in 65 (66%) patients, including 15 coinfecting with RSV and another virus. Although detection of a virus alone was associated with a higher concentration of LDH in nasal wash, children with RSV infection in particular had a significantly greater LDH level in

nasal wash than did children not infected with RSV.

A higher nasal wash to serum LDH ratio in children sent home from the ED, compared with those admitted to the hospital, supports the hypothesis that "LDH originates from widespread airway epithelial cell injury and apoptosis or from leukocytes (largely polymorphonuclear cells) present in the [nasal wash] fluid."

Dr. Laham and his colleagues noted that previous studies investigating the risk of hospitalization and the severity of disease in children with RSV infection largely corroborate these results and "support the concept of a protective effect derived from a robust innate immune response during an episode of RSV bronchiolitis, where inflammatory markers inversely correlated with disease severity."

In a multivariate analysis, an age of 3 months or younger, the need for intravenous fluids, and the presence of hypoxia were

significant predictors of hospitalization among children with bronchiolitis who presented to the ED.

However, a nasal wash LDH level reaching 365 U/mL or higher was associated with a significant 81% reduction in the need for admission.

In the same prediction model, the investigators calculated an area under the receiver operating characteristic curve of 0.87. Based on that area and a cutoff value of 0.5 for the predicted probability of hospitalization, the model predicted hospitalization with 81% sensitivity and 77% specificity.

"These values are comparable to many of the point-of-care tests used in diagnosing a viral infection. The LDH assay is easy to perform, inexpensive, and available in most clinical laboratories. At our institution, the expected turnaround time for serum LDH is 1 hour, and [nasal wash] samples should not be treated differently," Dr. Laham and his associates wrote.