U.S. Incidence of Rubella Disease and CRS

Mary Anne Jackson, MD | Division Director, Infectious Diseases
Medical Editor, The Link Newsletter | Professor of Pediatrics

The devastating effects of maternal rubella are well known, with resultant congenital defects noted in close to 90 percent of infants when maternal infection occurs in the first trimester, 50 percent when maternal infection occurs between 13-16 weeks gestation, and 25 percent when mothers are infected during the later second trimester. The last major rubella outbreak in the U.S. was from 1964-1965 when 12.5 million cases of rubella occurred and 20,000 infants were born with congenital rubella syndrome (CRS). Following implementation of a universal U.S. rubella vaccine program, rubella disease and CRS have rarely been reported in the U.S. From 2004-2011, fewer than 16 cases of rubella have been reported annually and only two cases of CRS were reported.

In the March 29, 2013 issue of Morbidity and Mortality Weekly Report, the CDC confirmed there were three cases of CRS in infants born in the U.S. in 2012. The mothers of the infants were all in their 20s, unimmunized against rubella, and born in Tanzania, Nigeria and Sudan respectively. The women traveled to the U.S. after the early part of their pregnancies. A rubella-type illness during pregnancy was reported in only one of the three mothers.

Affected infants were growth retarded and born prematurely (at 36 weeks, 33 weeks and 32 weeks respectively) and classic clinical manifestations of CRS including cardiac defects (3), cataracts (2), chorioretinitis (1), thrombocytopenia with blueberry muffin spots (1), liver dysfunction (2) and hearing impairment (1) were noted; one infant died.

Practitioners should be alert to the possible diagnosis of CRS in infants with typical defects, especially if their mothers were born or traveled to a region where the rubella virus continues to circulate. Rubella containing vaccines are utilized as part of a national immunization program in 130 countries around the world, but only three countries in the African region. In general, regions of Africa, the Eastern Mediterranean and Southeast Asia do not utilize rubella vaccines.

Visual Diagnosis

What's the Diagnosis?

A healthy 6-month-old male presents with four weeks of facial rash. Mother reports “pink bumps” started on his lower eyelids and then spread around his mouth and nose. No pruritis, oozing or crusting had been noted. The patient is well without fever or other signs of illness. He recently started eating a variety of baby foods, but no exposure to new soaps or lotions was reported. A bland emollient was applied twice a day for a week without improvement. The rash worsened after application of desonide cream. Pink papules coalescing into pink plaques around his mouth, along with scattered pink papules under his eyes and nose, are noted on exam.

Which of the following is the best treatment option for this patient?

A. Diphenhydramine
B. Hydrocortisone 2.5% ointment
C. Metronidazole 1% cream
D. Mupirocin 2% ointment
E. Nystatin cream

If you encounter an infant with possible CRS, the diagnosis should be confirmed with serology and culture, and specimens should be collected and sent to the CDC as soon as the diagnosis is suspected. Viral genotyping will also be performed at that time. The vaccination status of all women of child-bearing age should be confirmed and of course, a comprehensive evaluation including immunization assessment is critical for all international travelers.
New Policy Takes a Stand Against Trampolines

Tom Tryon, MD, FAAP | Associate Division Director, Urgent Care
Associate Professor of Pediatrics

As an urgent care physician with decades of experience working in both an emergency room and urgent care setting, it is amazing to me how many times I have seen children with trampoline injuries. To the chagrin of my children, my wife and I consistently have refused to purchase a trampoline. Now, the AAP has validated that decision with a new policy statement advising against recreational trampoline use. The updated policy statement, "Trampoline Safety in Childhood and Adolescence" was published in the October 2012 issue of the Journal of Pediatrics. The new policy provides pediatricians with guidelines and information on issues such as patterns of injuries with trampoline use, evaluating effectiveness of safety measures and information about the epidemiology of trampoline injuries.

The data is staggering. According to the National Electronic Injury Surveillance System (NEISS), in 2009, almost 98,000 injuries occurred in the U.S. to children, adolescents and adults playing on trampolines. These injuries resulted in 3,164 hospitalizations. Most injuries were sprains, strains, contusions or other soft tissue injuries. However, up to 37 percent of injuries were in children under 6 years of age and this age group had a much higher incidence of more severe injuries. In fact, while fractures or dislocations only occurred in 29 percent of injuries of children from 6-17 years old, they occurred in 48 percent of children 5 years old or younger. Also alarming is that 17 percent of injuries involved the head and neck, with 0.5 percent of all trampoline injuries resulting in permanent neurological damage. In addition, adult supervision did not preclude many injuries from occurring. Further, current data on safety netting or other safety equipment does not show a decrease in injury rates.

For families who insist on owning trampolines, the AAP recommends parents check with their homeowner’s insurance company to verify that trampoline-related claims are covered. Parents are encouraged to ensure all springs and side rails have adequate protective padding and are routinely inspected and maintained. Make sure the trampoline is level. Prohibit somersaults and flips on the trampoline as they increase the risk of cervical spine injuries. Finally, recommend against having more than one jumper on the trampoline at a time. With education and guidance, our hope is to encourage our patients to find safer ways to play.

References:

Evidence-Based Strategies for Common Clinical Questions

Are Fluoroquinolones the Superior Treatment for Bacterial Conjunctivitis?

Ross Newman, DO | General Pediatrics | Associate Program Director, Pediatric Residency Program | Assistant Professor of Pediatrics
Calle Donohue, DO | Pediatric Chief Resident

Conjunctivitis is a common pediatric diagnosis with both infectious (viral or bacterial) and noninfectious (anatomical abnormalities, allergies, trauma and neoplasms) etiologies. In pediatrics, bacterial conjunctivitis is considered most common and typically results from infections of Haemophilus influenzae, Streptococcus pneumoniae and Moraxella Catarhalis.

Clinical distinction between etiologies can be challenging. February 2011’s issue of The Link evaluated the evidence for identifying clinical symptoms most consistent with a diagnosis of bacterial conjunctivitis. The clinical bottom line stated patients with conjunctivitis symptoms, including mucopurulent discharge and a history of glued eyelids in the morning, were most likely to have bacterial disease.

Identification of viral vs. bacterial causes can be important because while conjunctivitis as a whole is typically self resolving, the duration of bacterial conjunctivitis is reduced by the use of topical antibiotics. A 2009 Cochrane review including 1,034 adult and pediatric patients found that while 65 percent of patients had clinical remission on days 2-5 of placebo treatment, treatment with any included topical antibiotics (polymyxin B-trimethoprim) was statistically beneficial in achieving both clinical and microbiological remission.

Polymyxin B-trimethoprim and topical fluoroquinolones, like moxifloxacin, are the most commonly prescribed topical antibiotics for the treatment of bacterial conjunctivitis. Recent concerns for increasing resistant strains of the most common bacteria have led many physicians to believe that newer topical fluoroquinolones are superior to older antibiotics such as polymyxin B-trimethoprim. Supportive arguments show that topical fluoroquinolones have lower in vitro minimal inhibitory (MIC) against the most common bacteria in comparison with polymyxin B-trimethoprim.

To evaluate the clinical ramifications of the different in vitro MIC values, Williams, et al, in a 2012 Journal of Pediatrics article, completed a randomized controlled trial comparing moxifloxacin and polymyxin B-trimethoprim. In this study, 124 patients aged one to 18 years with acute conjunctivitis (65 percent with recognized Haemophilus influenzae, Streptococcus pneumoniae or Moraxella Catarhalis identified on culture) were enrolled and 114 completed a seven-day treatment with moxifloxacin (n=56) or polymyxin B-trimethoprim (n=58). Resolution of conjunctivitis was measured by parental phone query at four to six days in 114 patients (77 percent cure by moxifloxacin and 72 percent cure by polymyxin B-trimethoprim) and by clinician evaluation at seven to 10 days in 89 patients (95 percent cure by moxifloxacin and 96 percent cure by polymyxin B-trimethoprim). Overall, there was no significant clinical difference in cure rates with a seven-day treatment with moxifloxacin vs. polymyxin B-trimethoprim.

The authors discuss the implications of this study extend beyond a simple choice in multiple topical antibiotics to treat bacterial conjunctivitis. The economic implications are great as the average cost of polymyxin B-trimethoprim is markedly less (average of $16 for 10 ml in Rochester,
NY) than for moxifloxacin (average of $105 for 3 ml in Rochester, NY). This extrapolates to up to $300 million per year in medical cost savings.¹

Clinical bottom line: Bacterial conjunctivitis is a common diagnosis in pediatrics and recent evidence suggests cheaper, older topical polymyxin B-trimethoprim is just as effective in treatment as the newer, more expensive topical fluoroquinolones, like moxifloxacin. ●

References:

What’s the Diagnosis?
Brandi L. Morrison, DO | Assistant Professor of Pediatrics

Answer: C. Metronidazole 1% cream

Periorificial dermatitis (PD) is a more appropriate designation for a perioral dermatitis that is considered by some to be a juvenile variant of rosacea. It is most common in prepubertal children but can be seen in infants as young as six months and is also seen in adolescents. It is an inflammatory eruption of erythematous papules, papulo-pustules and papulo-vesicles that can coalesce into plaques. Mild scale may be present. The primary sites of involvement are around the eyes, nose and mouth. There is typically a thin zone of sparing around the vermillion border. Unlike allergic contact dermatitis, PD is not severely pruritic, thus diphenhydramine is not indicated. Patients are often asymptomatic or may have a mild burning sensation.

Most pediatric patients with this condition had exposure to topical steroids. PD has also been reported with inhaled steroid use (usually starting in the nasolabial fold with perioral spread) or rarely, following systemic use. PD has also been reported with inhaled steroid use (usually starting in the nasolabial fold with perioral spread) or rarely, following systemic use. PD has also been reported with inhaled steroid use (usually starting in the nasolabial fold with perioral spread) or rarely, following systemic use. PD has also been reported with inhaled steroid use (usually starting in the nasolabial fold with perioral spread) or rarely, following systemic use. PD has also been reported with inhaled steroid use (usually starting in the nasolabial fold with perioral spread) or rarely, following systemic use. PD has also been reported with inhaled steroid use (usually starting in the nasolabial fold with perioral spread) or rarely, following systemic use.
In January 2013, two studies analyzed pediatric readmissions. In Pediatrics, Dr. Paul Hain and others at Vanderbilt looked at the likely preventability of early readmissions. They reviewed 200 readmissions over two years and found overall readmission rates of 8 percent, but only 1.7 percent of all such admissions were deemed preventable. Dr. Jay Berry and colleagues from Harvard reported in the January 23/30 volume of JAMA that the prevalence of pediatric readmission rates across 72 children’s hospitals averaged 6.5 percent but varied significantly across hospitals, age groups, and for different acute/chronic and medical/surgical conditions. They did not assess whether readmissions were preventable.

An article in JAMA Internal Medicine suggests five principles to aid efforts at reducing hospital readmissions in adults. These seem straightforward:

1. Match the intensity of the readmission reduction intervention to the patient’s risk for readmission. That is, focus on attaining the most value by addressing the greatest need. Higher-risk patients will require a higher-intensity intervention.

2. Avoid commonly used interventions that don’t work, or have no evidence for success. This might mean streamlining case/care management or post-discharge phone calls.

3. Use those interventions that have the longest lasting effect.

4. Create an effective local team composed of the right interdisciplinary providers before implementing interventions.

5. Broaden the focus for interventions to target previously unattended to high-risk populations for readmission. In children, these might include those with complex conditions and care needs, those with cardiac or neurosurgical conditions and sickle cell anemia.

As in adults, pediatric readmission rates are higher for those with complex, chronic conditions and those dependent upon medical technology. And like our adult colleagues, we all should be interested in reducing preventable readmissions for the sake of the child, the family and the overall viability of our health care system. But we should also be attentive to what makes pediatric readmissions different, and whether real prevention can always happen. Along these lines the following observations are made:

- Adult readmission rates for some conditions may be >20 percent. Pediatric readmission rates are generally <10 percent.
- A very small percentage of pediatric readmissions are truly preventable.
- One or more complex and chronic disease states require special attention in hospital discharge planning.
- Improvement efforts for pediatric patients should focus on improved access to care – including less disparity in cases with minorities or public payers, ensuring broad Medicaid coverage by state-based programs, assuring availability and coverage for pediatric home health care, and addressing adolescent/young adult transitional care needs.
- Hospital cultures that attend to quality and safety, employ ethical precepts and principles, and encourage all parties to work together, may see enduring results.

In conclusion, rehospitalization in pediatric patients is a different phenomenon than in adult medicine, and we would do well to study it more before making rules and regulations that might have unintended consequences.

References:


3. Burke RE, Coleman EA. Interventions to Decrease Hospital Readmissions. JAMA Intern Med (Published online ahead of print, March 25, 2013).
Good News About Varicella Vaccine and a New Adjuvanted Influenza Vaccine

Christopher Harrison, MD | Director, Infectious Diseases Research Laboratory
Professor of Pediatrics

Varicella Vaccine: A recent study provides data about several common questions surrounding varicella vaccine. Investigators compared estimated pre-vaccine era rates of varicella and HZ (Herpes zoster) incidences from 1995-2009 to those among Northern California Kaiser Permanente patients.

Question 1. How effective is VZV vaccine protection and how long does it last?
Answer: Varicella protection lasts at least 14 years for 90 percent of recipients and is particularly effective after a second dose.

The ~7,500 post-vaccine-era subjects received their first varicella vaccine dose in 1995; 4,674 received one dose and 2,826 received two doses. Mean incidence of breakthrough-varicella was 15.9/1,000 person-years. This was nearly 10 times lower than in the pre-vaccine era. Varicella vaccine effectiveness based on this data was 90 percent during the 14 years of study. There was no waning effectiveness over time. As seen in prior studies, most (75 percent) breakthrough varicella was mild (<50 lesions). Also similar to prior reports, breakthrough rates were highest in the first four years post vaccine (~23/1,000 person-years) and less at 10-14 years post vaccine (~6.5/1,000 person-years). (Figure 1). Of note, there were no breakthrough varicella cases after a second vaccine dose.

Question 2. Do varicella vaccines get HZ?
Answer: Yes, but less often and less severe than with wild type infection. HZ cases were mild, and rates were lower (~40 percent less often) in vaccines than in unvaccinated children from the pre-vaccine era (relative risk: 0.61 [95 percent confidence interval: 0.43–0.89]).

Seizures and Influenza vaccine: CDC data from 2012-2013 reveals disappointing influenza vaccine effectiveness, particularly in young children and the elderly. This was in part due to a mismatch with the B strain. However, even in years with a good match, current killed influenza vaccines need improvement. One way to improve response in these vulnerable populations is to use an adjuvant with the vaccine. These populations have 30-40 percent increases in response with adjuvanted vaccines vs. standard influenza vaccine. However, the lay populace’s distrust of adjuvants has been a problem with potential implementation, one concern being potential increase in seizures with an adjuvanted killed influenza vaccine. A recent Swedish study gives reassuring data that an adjuvant does not increase chances of seizures in the week after adjuvanted influenza vaccine.

Investigators studied 373,398 people with and without histories of seizure disorders, in three Swedish counties. Subjects received monovalent AS03 adjuvanted pandemic A/H1N1 influenza vaccines. During the 90 days before and 90 days after vaccination, 859 people had seizures. During days 1-7 post-vaccine, when one would expect most acute adverse effects of the vaccine to occur, there was no increased seizure risk among those with or without a history of seizure disorders. From 8-30 days after vaccination, there also was no significant increased risk among either group.

Bottom Line: The risk of medically attended seizures did not increase following adjuvanted influenza vaccination.

References:
2. Arnheim-Dahlström et al. Risk of Presentation to Hospital With Epileptic Seizures After Vaccination With Monovalent AS03 Adjuvanted Pandemic A/H1N1 2009 Influenza Vaccine. BMJ (12/28/12)
Outbreaks, Alerts & Hot Topics:
U.S. Incidence of Rubella Disease and CRS

AAP Updates:
New Policy Takes a Stand Against Trampolines

Evidence-Based Strategies:
Are Fluorquinolones the Superior Treatment for Bacterial Conjunctivitis?

Ambulatory Approach:
Children's Mercy Discontinues Use of SimplyThick™

Pediatric Bioethics:
Rehospitalization – Again, Children Aren’t Little Adults

The Wide World of Vaccines:
Good News About Varicella Vaccine and a New Adjuvanted Influenza Vaccine

News Briefs

Upcoming Conferences and Symposiums

46th Annual Clinical Advances in Pediatrics Symposium
September 17-20
Children’s Mercy Hospital, Kansas City, Mo.
Information and Registration: www.childrensmercy.org/CAPS

Nationally recognized guest faculty includes:

John Barnard, MD, Nationwide Children’s Hospital
President, The Research Institute

Natasha Burgert, MD, Pediatric Associates
Author and Manager of KCkidsDoc.com

R.J. Gillespie, MD, MHPE, The Children’s Clinic
Medical Director, Oregon Pediatric Improvement Partnership

Janet Gilsdorf, MD, University of Michigan
Robert P. Kelch Research Professor of Pediatrics and
Communicable Diseases

Lu-Ann Papile, MD, Indiana University School of Medicine
2012-2013 Chairperson, AAP Committee on Fetus and Newborn

Looking for a Pediatrician for Your Practice?
If you are looking for a pediatrician for your practice, plan to attend the
Networking/Recruitment Lunch on Friday, September 20, during the annual
CAPS meeting at Children’s Mercy Hospital.

At this lunch, you will have the opportunity to interact and meet all pediatric
residents from Children’s Mercy Hospital. If you are interested in attending
this lunch, please contact Michelle McMillan, director of Physician Services
at 816-234-1641 or via email at mmcmillan@cmh.edu.

Visual Diagnosis in the March/April 2013 issue should have been
attributed to Amber Hoffman, MD, General Pediatrics, Associate
Program Director of Pediatric Residency Program, Assistant Professor
of Pediatrics, UMKC School of Medicine.

Contact Information
The Link is produced monthly by Communications and Marketing with editorial guidance
from Mary Anne Jackson, MD, the Associate Chair of Community and Regional Physician
Collaborations at Children’s Mercy. The columns and topics are provided by members of
the Children’s Mercy faculty and medical staff.

For more information contact: Jennifer Cisar (816) 701-4073; jlcisar@cmh.edu

The Link is available in print and e-mail newsletter formats. Designate your preference
(print, e-mail, both, neither) by going to www.childrensmercy.org/thelinkoptions.