Outbreaks, Alerts & Hot Topics

Vaccinia Virus Transmission after Smallpox Vaccination

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We recently fielded a call from one of our colleagues regarding the risk for transmission of smallpox vaccine virus from a recently immunized soldier to his child. While the child was hospitalized for chemotherapy, her father was granted leave from the Middle East to visit the child.

Transmission of vaccinia virus from a recently immunized individual to a susceptible contact is well reported, but less familiar to today's practicing physicians since the routine smallpox vaccine was eliminated in the U.S. in 1971. The military continued to vaccinate for smallpox until 1990 and then resumed vaccination for military troops and civilian contractors in 2002 as part of a post-September 2001 bioterrorism response.

Smallpox vaccine is a live lyophilized nonvariola vaccinia virus and is administered by superficial scarification technique and an inoculation site lesion develops (often termed “vaccine take”). Three to four days following vaccination, an itchy papule develops that evolves to a blister, which eventually scabs and falls off (sometime during the third or fourth week). The vaccine is contraindicated in pregnancy, for those breastfeeding, in those with underlying skin conditions or immune compromising conditions, or if the potential vaccinee has a household contact with one of these conditions. The vaccination is also not recommended currently for those with certain heart conditions or diabetes.

Experience tells us that complications of immunization occur in 1,000 for every one million inoculated. Auto-inoculation, that is, lesions inadvertently inoculated from the inoculation site by the vaccinee to another part of the patient's body, are well described for this reason: covering the inoculation site and education regarding site complications is routine. The image below shows an infant with auto-inoculation lesions (image courtesy of Dr. Fred Burry, circa 1950).

Secondary cases are described and usually follow intimate sports contact or household contact. Tertiary transmission has also been reported after household or sports contact and in one case, a mother transmitted the virus through breastfeeding.

A recently published case in MMWR1 is instructive and describes both secondary and tertiary transmission after smallpox vaccination. In the report, a secondary case occurred in an individual who developed umbilicated pox-like lesions on the lip and perianal area a week after sexual contact with a civilian who was immunized as part of the Department of Defense smallpox vaccination program. One week later, while skin lesions were present, the secondarily infected individual had sexual contact with another individual who developed a flu-like illness and papular skin lesions in the perineum (tertiary transmission). In both cases, skin lesions were swabbed and nonvariola Orthopoxvirus was detected by PCR. Both of the patients were hospitalized and received vaccinia immune globulin (VIGIV; available from the CDC) based on their medical histories (history of psoriasis and childhood eczema respectively) and the extent of lesions.

The typical recommendations given to the vaccinated military personnel include lesion care (coverage with semipermeable dressing and frequent dressing changes); maintenance of meticulous hand hygiene including that related to contact lenses; caution with care of clothing, bedding and towels; and avoidance of any intimate contact (including sexual contact) until lesions are healed. In our case, the vaccinee’s inoculation site skin lesion had already evolved sufficiently and we felt the father could safely visit, however strict contact precautions were enforced.

Resources:

Visual Diagnosis

What’s the Diagnosis?

An 8-year-old female has a two-day history of erythema, warmth and pain on the dorsum of her right foot 10 days after she was stung by a stingray while vacationing in Grand Cayman. Her foot was soaked in hot water for one hour following the injury. X-ray of the foot did not reveal a foreign body and ultrasound was consistent with cellulitis. A small amount of purulence drained from the area of the sting, and bacterial culture revealed Streptococcus pyogenes.

In addition to typical skin pathogens, which of the following organisms is associated with soft tissue infection in the setting of salt water injury?

A. Aeromonas hydrophila
B. Clostridium tetani
C. Edwardsiella tarda
D. Mycobacterium marinum
E. Vibrio vulnificus

[Image of a foot with a sting and the text: "What’s the Diagnosis? An 8-year-old female has a two-day history of erythema, warmth and pain on the dorsum of her right foot 10 days after she was stung by a stingray while vacationing in Grand Cayman. Her foot was soaked in hot water for one hour following the injury. X-ray of the foot did not reveal a foreign body and ultrasound was consistent with cellulitis. A small amount of purulence drained from the area of the sting, and bacterial culture revealed Streptococcus pyogenes. In addition to typical skin pathogens, which of the following organisms is associated with soft tissue infection in the setting of salt water injury? A. Aeromonas hydrophila B. Clostridium tetani C. Edwardsiella tarda D. Mycobacterium marinum E. Vibrio vulnificus"]
**Children in Poverty: A National Health Concern**

**Tom Tryon, MD, FAAP | Associate Division Director, Urgent Care**

**Evidence-Based Strategies for Common Clinical Questions**

**New Alert on Azithromycin**

**Ross Newman, DO | General Pediatrics | Associate Program Director, Pediatric Residency Program | Assistant Professor of Pediatrics**

Recent data tells us that poverty has a direct and lasting impact on the overall health of the child and that impact extends into adulthood. The latest statistics on children living in poverty are alarming. In fact, it is now recognized that 22 percent of all children live below 200 percent of the Federal Poverty Line. Children are now the poorest segment of society and the prevalence of children living in poverty is unchanged since the 1970s. Children raised in poverty have increased infant mortality rates, poorer nutrition and growth, poorer reading and math competency, higher rates of illiteracy, less access to quality healthcare, an increase in chronic conditions such as obesity and asthma and a persistent decrease in productivity during adulthood. While senior citizens were the largest segment of the population living in poverty in the late 1950s, policy decisions by the government at that time dropped the prevalence from 35 percent in 1959 to 9 percent in 2010. However, those same policy decisions have not been enacted to benefit children.

Children are now the poorest segment of society...

The American Academy of Pediatrics (AAP) has chosen to focus on poverty and child health as one of the four strategic agendas for children in 2013-2014. Recently, the AAP and the Academic Pediatric Association (APA) jointly sponsored a plenary session titled “A National Agenda to End Childhood Poverty” at the Pediatric Academic Societies (PAS) annual meeting in Washington, D.C. From plenary Co-Chair and current AAP President Thomas K. McInerny, MD, FAAP “How can this be the wealthiest country in the world when for four decades one in four of America’s children has been living in poverty for over four decades? The AAP and the APA have decided that now is the time to work on reducing childhood poverty as a major step to improve the health of our nation’s children, our most precious resource.” An excellent summary of the PAS plenary session can be found in the New York Times article titled “Poverty as a Childhood Disease” (http://well.blogs.nytimes.com/2013/05/13/poverty-as-a-childhood-disease).

This should not be an impossible challenge and we should take the lead from other countries who have successfully demonstrated significant impact on reducing poverty rates through long-term national efforts. Our children are our future, and making an early investment in programs that support them now will pay dividends in both the near-term and the future. Together, we can make a difference in the future for our nation’s children and our patients.

References:


**Ross Newman, DO | General Pediatrics | Associate Program Director, Pediatric Residency Program | Assistant Professor of Pediatrics**

In March 2013, the U.S. Food and Drug Administration (FDA) issued a warning alerting practitioners that azithromycin is associated with an increased risk for sudden death, particularly in patients with pre-existing cardiac disease. This warning poses a challenge as azithromycin is a commonly prescribed antibiotic and is a first-line agent for several diagnoses including patients’ treatment and chemoprophylaxis of pertussis. Pediatricians remain the most common provider to make a diagnosis of pertussis and, therefore, it often falls to them to ensure that household contacts of patients with pertussis receive timely chemoprophylaxis. In cases when an alternative provider is not readily available to supply such prescriptions, it falls on the diagnosing physician to provide chemoprophylaxis for household contacts in an effort to interrupt transmission of this highly contagious agent. With more than 40,000 cases reported in 2012 across the U.S. in children under 19 years old, physicians need to consider the new FDA warning in any situation where treatment of chemoprophylaxis with azithromycin is considered. This requires identifying children and adults with specific cardiovascular risk factors.

The FDA warning was based on a May 2012 study in the New England Journal of Medicine comparing adults from a Tennessee Medicaid cohort who took azithromycin or levofloxacin to those who received no drug or a drug without arrhythmic concerns, amoxicillin. Azithromycin-treated patients during the five days of treatment were found to be at greatest risk of sudden cardiac death, with a hazard ratio of 2.88 (p-value <0.001). Patients who took levofloxacin had a similarly increased risk of cardiovascular death, although point estimates were not statistically significant. Finally, patients who took no drug or amoxicillin were found to have low risk of sudden cardiac death, with a hazard ratio of 0.85 for amoxicillin (p-value 0.62).

Azithromycin is commonly utilized in treatment of Chlamydia and Mycoplasma infection and as an alternative agent in streptococcal pharyngitis. Consideration should be given to an alternative antibiotic for those with the following risk factors: long QT syndrome, other antiarrhythmias, hypokalemia, hypomagnesemia, uncompensated congestive heart failure or history of torsades de pointe. For those identified with cardiovascular disease history or arrhythmic concerns, doxycycline can be used for patients older than 8 years with Chlamydia or Mycoplasma disease. Clindamycin can be used in penicillin allergic streptococcal pharyngitis. Trimethoprim-sulfamethoxazole (listed as alternative in the Red Book) or ciprofloxacin may be used for patients with pertussis.

If caring for a child with long QT syndrome or one in whom anti-arrhythmic agents are being utilized, consultation with his or her cardiologist is prudent. The SADS Foundation provides their patients with lists of drugs to avoid and classifies them based on risk (Group 1 highest risk, Group 2 risk under certain conditions and Group 3 potential/theoretical risk). Clinicians should be aware of the addition of azithromycin to the list of drugs to avoid because of the high risk for prolonging the QT interval. They also need to realize ciprofloxacin and TMP-SMX (potential risk) are also on the list of drugs to avoid and counsel appropriately.

**Conclusion:** Pediatricians should continue to use azithromycin when indicated and continue a practice of judicious antibiotic use. When
prescribing azithromycin for any patient it is appropriate to obtain a limited cardiac history to assess for risk factors, discuss the risks and benefits of treatment and complete appropriate documentation. For patients with an identified risk, consideration should be given to appropriate alternatives, such as ciprofloxacin or trimethoprim-sulfamethoxazole, along with consultation with the patient’s cardiologist.

Ambulatory Approach to Common Subspecialty Problems

Dip your OARS in the Water

Sarah Hampl, MD | Medical Director, Weight Management
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Chair, Medical Staff Bylaws | Associate Professor of Pediatrics

How we talk with patients and families is just as important as what we talk about. Using the OARS acronym, tips that showcase proven patient-centered techniques, can help guide you through difficult conversations. For example, talking about obesity is not an easy task, but can be made more comfortable for both the family and you when you “dip your OARS in the water.”

First, open with a brief structuring statement and ask for the patient’s and parents’ permission to discuss weight-related behaviors with them. This could sound like, “I’m glad you came in today for a visit. After reviewing your growth patterns, I’m concerned about your weight. Would it be ok if we talk about that for a few minutes?” Next you’ll segue into using your OARS:

**O**—Open-Ended Questions

Open-ended questions encourage patients and parents to talk more which happens less when asking traditional “yes or no” questions. Instead of, “Do you eat fruits and vegetables?”, try, “Tell me about the fruits and vegetables you eat on a typical day.”

**A**—Affirmation

Give the patient and parents positive feedback for sharing their feelings with you. Feeling encouraged and accepted by you and knowing you are there to help them decreases their resistance toward change. “It must be really hard for you to talk about how the other kids make you feel,” is an example of an affirming statement.

**R**—Reflection

Validate the feelings the patient or parents express about weight-related behavior by reflecting back to what you’ve heard them say already. Reflections can range from simple rewording of a statement to transforming a statement into a metaphor. Either way, your use of reflections helps the patient and parents know they’ve been heard. Here’s an example:

Parent: “Having my kids watch TV is the only way I can prepare dinner.”
Provider: “It’s hard to keep your kids occupied while you’re fixing dinner.”

**S**—Summarize

Whether or not the patient and parents have agreed to set a goal with you, you can close the encounter with a short summary of what you’ve discussed. This should include a plan for follow up. For instance, “We’ve talked about a lot of things today, and you’ve said you want to work on getting less screen time as a family. You set a goal to only watch TV on the weekends. Would you be willing to come back in two months to talk about how you’re doing with that goal and recheck your growth?”

For more information on how to incorporate this counseling style into your practice, visit:
http://www.letsgo.org/programs/healthcare/toolkits/ and look under “Talking with parents and families”
www.kphealtheducation.org and click on pediatric overweight for a fun, free interactive 1 hour training

For information about Children’s Mercy Weight Management Services, visit: www.childrensmercy.org/weightmanagement.

Visual Diagnosis?

What’s the Diagnosis?

Angela L. Myers, MD, MPH | Pediatric Infectious Diseases Fellowship Program Director
Assistant Professor of Pediatrics

Answer: **E. Vibrio Vulnificus**

*Aeromonas hydrophila* is a gram negative motile bacillus that can cause rapid onset cellulitis, necrotizing fasciitis and sepsis in the setting of penetrating trauma in fresh and brackish waters. In addition, *A. hydrophila* is associated with water-exposed wood and soil. *Clostridium tetani* is a spore forming gram positive bacillus. While the organism itself does not cause tissue destruction or an inflammatory response, *C. tetani* produces an exotoxin that binds to the myoneuronal junction of skeletal muscles and the spinal cord, blocking inhibitory impulses to motor neurons thus causing severe muscle spasms. *C. tetani* has a worldwide distribution and is normal enteric flora of humans and many animals. *C. tetani* is most commonly found in soil that is contaminated by excreta and in warm climates and during warmer months, but is not associated with water-based trauma.

 Abrasions, lacerations, and penetrating injury may predispose to cellulitis, sepsis, or gas gangrene caused by *Edwardsiella* spp. found in freshwater environments. *E. tarda* in particular colonizes catfish fins and has been associated with pyogenic arthritis from noodling (bare hand fishing for catfish). *Mycobacterium marinum* is a non-tuberculous mycobacterium associated with lesions at the site of injuries associated with non-penetrating trauma in fresh and brackish waters. In addition, *M. marinum* is often found in soil that is contaminated by excreta and in warm climates and during warmer months, but is not associated with water-based trauma.

Spontaneous infections (i.e. linear along the lymphatic vessels). Surgical excision may be necessary and prolonged combination antimicrobial therapy is required. First described by the CDC in 1979, *Vibrio vulnificus* is a gram negative facultative anaerobic bacillus that is associated with life threatening illness following salt water associated trauma; >200 U.S. cases and >70 deaths are reported annually. Soft tissue infection may develop

References:

1. FDA Drug Safety Communication: Azithromycin (Zithromax or Zmax) and the risk of potentially fatal heart rhythms. www.fda.gov.
Protecting Premature Babies

John Lantos, MD | Director, Pediatric Bioethics | Professor of Pediatrics

The controversy over a recent neonatal clinical trial of oxygen therapy for premature babies offers two starkly different prescriptions for protecting babies from risky treatments in neonatal intensive care units.

One view, advocated by the federal Office of Human Research Protection (OHRP) and the advocacy group Public Citizen, is to warn their parents (e.g. stingrays, sea urchins, coral and other stinging fish) should include immersion of the affected body part in hot (non-scalding) water for 30-90 minutes. If infection develops, knowledge of the type of water exposure is key to developing a differential of potential organisms. Combination therapy with clindamycin and ciprofloxacin may be appropriate empirically, but consultation with infectious disease experts is recommended in such cases.

References:

Research can be a risky endeavor, but not always. Sometimes, patients are safer in research protocols than they are being treated with standard treatments outside of research protocols. Reasons for this are unclear. Perhaps it is selection bias, that is, the people who agree to be in research trials may be healthier, better educated, or different in some other way that influences outcomes. Perhaps it is that patients who are enrolled in clinical research trials are monitored more closely for side effects of treatment. Or, perhaps treatment that follows pre-defined algorithms is safer and more effective than treatment based on the clinical judgments of individual doctors.

Whatever the reason, it is apparent that being in the study was not risky. It follows that that patients are ill-served by a regulatory system that presumes that all research is always riskier than conventional treatment. Each research project needs to be evaluated on its own merits. Researchers, of course, have the obligation to inform potential research subjects of the nature of the research and of the potential risks and benefits. That information should be delivered in language that is accurate and understandable. OHRP and Public Citizen got that principle right. They simply did not do their homework to understand how the principle should be applied to this study. They did not understand either the state of knowledge about oxygen therapy at the time the study was initiated or the implications of the study’s findings. The study was safe for the babies who were in the study and yielded valuable information that will help future babies. Babies need to be protected from research risks. They also need to be protected from misguided federal agencies and overzealous “advocacy groups.”

References:
A potentially catastrophic influenza outbreak is predicted to occur every 20-40 years. Are we prepared? Public health agencies dread this looming outbreak. Imagine your job is deciding which emerging animal-derived influenza is likely to be the next big thing.

The H1N1pdm2009 pandemic was less devastating than predicted, largely based on two things. First, many vulnerable elderly retained protection from prior experience with a related influenza from decades ago, reducing potential excess mortality to mild/moderate disease. Second, an enormous public health response developed new vaccines in record time and implemented large vaccine campaigns. Thus ~50 percent of younger populations without protection from prior experience got vaccine-induced protection. Mother Nature and health providers, public and private, are credited with blunting the H1N1pdm09 effects. It was a near-miss next big thing.

It was a near-miss next big thing. But the threat remains. New mutated pandemic strains are more likely now than decades ago.

But the threat remains. New mutated pandemic strains are more likely now than decades ago. Dense populations have frequent direct contact with pigs, chickens or ducks, e.g. Asians living in animal markets. Each year, new pig/bird influenza strains cause human infections, usually in Asia. The fear is a recombination during dual infection (strain with sustained person-to-person contagion acquires lethal animal strain genes) in the same host,—which happened with the 1917 strain.

Current pandemic candidates are the H3N2v pig strain and now H7N9, the first H7 strain causing human disease. By May 8, 2013, 130 confirmed H7N9 cases in five Chinese provinces and one in Taiwan caused 32 deaths (25 percent mortality). Most H7N9 “bird-flu” cases had direct contact with poultry. Hundreds of thousands of birds were sacrificed to limit the reservoir. H7N9 contact surveillance shows no sustained human-to-human spread so far. Limited human-to-human spread appears likely, but all it takes is one of those dual infections and we could have the next big thing.

Are we prepared? Regional test sites in the U.S. have H7N9-specific test kits. Routine influenza PCR testing can indirectly indicate H7N9 (non-subtypable influenza A). So if H7N9 gets to the U.S., we can detect it – if we are thinking about it. Current H7N9 strains are oseltamivir/zanamivir susceptible, so treatment is available. Cases could happen at any time, so if you see “influenza” in a recent traveler from/to China or in a direct contact with someone recently from China, testing is reasonable. We are happy to discuss such cases.

Given high mortality but currently limited person-to-person spread, would your decision be to develop an H7N9 vaccine? Remember, worldwide spread will be quick in the 21st century given our globally mobile society. Also consider the disaster from even conservative estimates of one in 10 people acquiring a rapidly spreading influenza with 25 percent mortality. Luckily you don’t need to decide. Public health agencies already did and are developing a vaccine. In fact, we at Children’s Mercy Hospital may be asked to test an H7N9 vaccine in children during the next year. Stay tuned, but let’s hope the next big thing is decades away.
News Briefs

2013 Clinical Advances in Pediatrics Symposium Registration Now Open
Children’s Mercy Health Network is pleased to announce registration for the 46th Annual Clinical Advances in Pediatrics Symposium is now open. The symposium will be from Tuesday, September 17 through Friday, September 20. Hosted by Children’s Mercy Hospital, we invite you to listen to nationally recognized speakers presenting the latest information on gastroenterology, infectious diseases, neonatology, quality improvement and social media.

Registration for the event is free to CMH employees. For more information or to register, please visit http://www.childrensmercy.org/caps/.

Kathy Goggin, PhD, Named Director of Health Services and Outcomes Research
Kathy Goggin, PhD, has been named Director of Health Services and Outcomes Research, a new position at Children’s Mercy Hospitals and Clinics. Her appointment is effective Sept. 3, 2013.

Dr. Goggin will hold the Ernest L. Glasscock, MD, Chair in Pediatric Education and Research at Children’s Mercy. Her program of research focuses on primary and secondary disease prevention, medication adherence, and psychosocial predictors of health behavior change to improve health outcomes and reduce health disparities.

Contact Information

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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.