INFECTION DISEASE
MIS-C

What you need to know right now

Nutrition
FPIES in children is often misunderstood

Mental Health
Manage stress of serious food reactions

Pediatric Pharmacology
A new treatment helps overactive bladders

Respiratory Disorders
Teens’ vaping leads to serious lung injuries

Dermatology
Are these itchy spots poison ivy?
ANGER... MELT... HOME LIFE DIVISION...

ADHD* IMPACTS MORE THAN ACADEMIC PERFORMANCE

A child’s ADHD can cause substantial stress among caregivers—including parents and siblings. As one of the most valued and trusted resources for families impacted by ADHD, you may be able to help diffuse some of the tension at home. You can reinforce that families are not alone in what they are experiencing. It is also helpful to share that while pharmacological treatment is often the primary focus of ADHD management, a multimodal treatment plan individualized to each child’s needs is recommended for patients with ADHD.

Strategies included in the treatment plan may include:

- Parent behavior therapy
- Cognitive behavioral therapy (CBT)
- ADHD coaching
- School accommodations

While living with ADHD can be challenging, it’s also important to remind parents and caregivers that there are many positive aspects to ADHD. Children and teens with ADHD can channel their symptoms into some remarkably positive traits, such as being:

- Extroverted/open to new experiences
- Energetic/fun seeking
- Free spirited/less conventional

You can help. Dive deeper into complex ADHD at www.TEAM-ADHD.com.


*Attention-deficit/hyperactivity disorder.

Not actual patients. Fictionalized for illustrative purposes.
Our website gets a facelift

There is a new website in town! Contemporary Pediatrics recently unveiled its new multimedia site, making it more pertinent and interactive than ever with the most up-to-date pediatric information and trends.

Our new website will provide a streamlined experience to access information in the simplest way possible, and while ContemporaryPediatrics.com has always focused on the needs of the practicing pediatrician, this recent upgrading of our digital platforms signifies our commitment to being a “first responder” when it comes to the changing needs of the pediatric community.

In addition to improved site navigation, ContemporaryPediatrics.com now houses a regular podcast series. These interviews will offer insights and analyses on the latest news in Pediatrics as well as actionable tips for health care workers. We will, of course, also continue to cover the most trending topics in Pediatrics today, including infectious disease, respiratory disorders, pediatric pharmacology, dermatology, and nutrition.

We hope you enjoy our revamped website, and that it helps you make the most informed decisions possible regarding patient care.

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Chairman and Founder
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Respiratory season is ready to roll.

Molecular point-of-care testing for a healthier back-to-school season.

School is back in session, but it’s much different than before. As your clinics start to fill with patients experiencing respiratory symptoms, many will be asking to be tested for COVID-19. However, with less than 11% of all SARS-CoV-2 tests being positive, the cause of most respiratory infections will remain unclear. The CLIA-waived BioFire® FilmArray® Respiratory EZ (RP EZ) Panel simultaneously tests for 14 of the most common non-SARS-CoV-2 respiratory pathogens in about an hour—helping you identify the probable culprit faster, so you can provide the right treatment sooner and get kids back to class fast with in-clinic testing from BioFire.


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  With results in about one hour, you can diagnose patients faster and potentially reduce further medical follow-up care.

- **Improve Operational Efficiency**
  The BioFire RP EZ Panel is CLIA-waived and easy to use. It takes just two minutes of hands-on time and one swab.

- **Reduce Costs of Unnecessary Tests**
  The BioFire RP EZ Panel is accurate with 96.8% sensitivity and 99.5% specificity. Plus, it identifies more than just Flu A and B — a comprehensive panel can help you identify the real culprit without additional testing.

- **Prescribe the Right Treatment**
  The BioFire RP EZ Panel may help improve your antimicrobial stewardship program by aiding in more accurate and timely diagnosis and potentially reducing unnecessary antibiotic prescriptions.

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**Syndromic Testing: The Right Test, The First Time.**

2. Clinics must be certified for CLIA-waived testing to operate the BioFire RP EZ Panel.
3. The stated performance is the aggregate of the prospective data from the clinical study.
Happy summer! As we move into the now fourth month of the COVID-19 pandemic, we have had to adjust to new ways of providing comprehensive care to all our patients. The pandemic has led to some unintended consequences in our ability to provide this care, the most critical being the immunization of infants and children in a timely manner.

Studies have shown that up-to-date vaccine status for the recommended childhood vaccines has significantly decreased since the start of the pandemic, with less than 50% of infants and children in many areas of the United States being reported as current on their vaccines. This decrease has been most striking for infants and children enrolled in Medicaid insurance programs. The marked drop in immunization rates has a major impact on herd immunity and leaves these infants and children susceptible to vaccine-preventable diseases such as measles and pertussis. As pediatric health care providers, we need to make a concerted effort to get patients back into the office for their vaccines against all the vaccine-preventable diseases.

COVID-19 infection for many children is milder than that seen in the adult population. However, as we continue to learn more about COVID-19, there are new issues that have a significant impact on our ability to care for our patients. The emergence of multisystem inflammatory syndrome in children (MIS-C) has demonstrated that COVID-19 infection in some children can be serious and life threatening, and that has added a sense of urgency in the diagnosis and treatment of these patients.

This issue of Contemporary Pediatrics is dedicated to Infectious Disease, with many articles exploring different aspects of COVID-19 infection in infants and children and intended to provide health care providers with guidance in diagnosis and management. The articles focusing on COVID-19 include:

- **Your Voice: Could fever improve COVID-19 outcomes?**—This article is an interesting opinion piece addressing the impact that the presence of fever may have in recovery from COVID-19 infection. **PAGE 8**

- **Clinical feature: Multisystem inflammatory syndrome in children (MIS-C) associated with COVID-19**—Here is a summary of information presented in a most successful webinar on MIS-C that provides comprehensive guidance for the pediatric practitioner on the diagnosis and treatment of this potentially life-threatening syndrome. **PAGE 18**

- **AAP guidance: Managing infants born to mothers with COVID-19**—This document provides very practical guidance on the recommended testing and management of neonates born to mothers with COVID-19 in a variety of different settings. **PAGE 23**

Even as we continue to work through the

CONTINUED ON PAGE 33
**Thick, Rich Derma Problem-Solvers**

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Humans do not have any natural immunity to COVID-19. We do not have an effective antiviral medication for nonhospitalized patients. We do not have a vaccine and may not for at least a year. Perhaps we should optimize the human body’s natural response to infections. To us, that means helping fever do its job.

When the body is invaded by a new germ, it mounts a fever. The fever ramps up our immune system, which is necessary to fight infections. All warm-blooded animals get fevers when they have infections. Every aspect of our immune system works better at a higher temperature. Was that a design flaw? Why would our bodies waste energy on something that isn’t helpful?

Dogs, rabbits, mice, ferrets, lizards, fish, and other species have been studied for what happens if we inject them with germs and suppress their fever. They have a higher death rate. Humans should be no different. Yet you ask: Are there similar studies on humans?

Research has shown that people with infections who are treated with fever-reducing medicines have symptoms that often are more severe and last longer than those who don’t take antifever medicines. These articles on rhinovirus, influenza, chickenpox, and other respiratory infections all showed improved outcomes if the associated fever was not treated. To date, there is no published research that shows treating fevers with antipyretics improves outcomes.

Treating fever from vaccines
What about fever from vaccines? Two studies looked at what happens if we give prophylactic antipyretics to young children before or immediately after vaccines. Both found that antipyretics cause a lower antibody response when measured one month later.
Obviously, our views apply to all viral infections, not just the dangerous one that currently holds center stage. We would suggest health care professionals stop interfering with the human body’s attempt to cure itself. Here’s how we might do that:

- Respect the known benefits of fevers.
- Understand that the human body has a thermostat in the hypothalamus that keeps the fever in the optimal range for fighting infections.
- Do not treat all fevers with antipyretics (acetaminophen or ibuprofen).
- Never treat with combination (dual) antipyretics. It’s one of the main causes of fever phobia, mainly propagated by physicians and nurses.
- Keep patients well hydrated so they can easily give off heat by sweating if they need to.
- Teach the public that most fevers are good, not bad. Teach that reducing fevers may make you feel better but delay your recovery.
- Teach the public that every time we give an antipyretic, we dampen the body’s natural immune response.

That’s why the fever always returns when the medicine wears off.

In summary, there is evidence that fever improves outcomes for infections. Of note, there is no evidence to the contrary. Let’s be evidence based.

The human body wants to recover, to survive. Shouldn’t we support that?

COMMENTS? E-mail them to llevine@mjhlifesciences.com

For references, go to ContemporaryPediatrics.com/fever-and-COVID-19

Dr. Schmitt is professor of Pediatrics, Section of General Academic Pediatrics, Children’s Hospital Colorado, University of Colorado School of Medicine, Aurora, Colorado.

Dr. Offit is professor of Pediatrics, Division of Infectious Diseases. Children’s Hospital of Philadelphia, Perelman School of Medicine at the University of Pennsylvania, Philadelphia.

The authors have nothing to disclose in regard to affiliations with or financial interests in any organizations that may have an interest in any part of this article.
A limited abdominal ultrasound (US) is a safe and effective way to assess for intestinal malrotation (IM) with or without midgut volvulus (MGV), according to a retrospective study. An upper gastrointestinal (UGI) series has long been considered the imaging gold standard for making this assessment.

Investigators searched radiology reports at a children’s hospital for patients who were evaluated for MGV using US during 2016 and 2017 and examined the relevant charts for any events that happened in the month following the US. Of the 195 patients who received a US evaluation, the most common presentations were vomiting (44%) followed by abdominal pain and suspected malrotation. Median age was 77 days, with 91% of patients aged younger than 1 year, half of whom were aged younger than 1 month.

The US studies were evaluated for 2 abnormalities: twisting of the small bowel and vasculature around the superior mesenteric artery (SMA), indicative of IM; and occlusion of the SMA, indicating MGV. Of the 195 US studies, 179 were diagnostic; that is, they could include or exclude MGV. (Sixteen studies were not diagnostic because of overlying bowel gas.) Of the diagnostic studies, 14 were found to be positive for MGV, which was confirmed at surgery.

For the 164 patients with a negative US who did not have surgery, no negative outcomes were reported. In other words, US was diagnostic in 92% of patients, and in those individuals, it had a sensitivity and specificity of 100%.

Seven of the 16 patients with nondiagnostic US studies were evaluated further with UGI exams, and all tested negative for MGV or malrotation, although 1 patient later was confirmed surgically to have malrotation without volvulus. The remaining 6 patients did not receive further imaging, and either were followed clinically (their symptoms resolved) or underwent surgical exploration that revealed other causes of abdominal pain.

The authors noted that unlike UGI, US does not expose the child to radiation or fill his or her stomach with contrast. In addition, US offers portability and repeatability.

Dr. Jon Matthew Farber, MD, section editor for Journal Club, is a pediatrician in Woodbridge, Virginia. Ms. Freedman is a freelance medical editor and writer in New Jersey. The editors have nothing to disclose in regard to affiliations with or financial interests in any organizations that may have an interest in any part of these articles.
Levonorgestrel IUDs are safe and effective in adolescents

A study in postmenarchal youngsters aged from 8 to 19 years found that the levonorgestrel intrauterine device (IUD) is successful in controlling abnormal uterine bleeding and in suppressing menses.

Investigators reviewed the charts of 166 patients who had the devices inserted at some point during a 6-year period for whom follow-up data (from 3 to 60 months after insertion) were available. Some of these patients used the 52-mg IUD and others the 13.5-mg IUD. The IUDs were inserted for contraception, management of heavy menstrual bleeding, and menstrual suppression. Researchers collected data on menstrual history and demographics before and after the devices were inserted.

The overall rate of amenorrhea among participants was 39.8%, with no difference between the patients having the 52-mg IUD and those with the 13.5-mg device. Preinsertion menstrual characteristics, such as regularity and flow of the menstrual cycle or a history of bleeding or of developmental delay, did not have a significant effect on the rate of amenorrhea or bleeding patterns after insertion.

Of the 100 patients who did not experience amenorrhea, 32% reported light vaginal bleeding and 35% reported moderate or heavy vaginal bleeding. Among users who described their cycle as regular before insertion, 28.6% reported spotting, 26.8% said they had light vaginal bleeding, and 44.6% had moderate to heavy bleeding after insertion. These proportions were not significantly different among those who described their cycle as irregular before IUD insertion, although only 23.3% in this group reported moderate to heavy vaginal bleeding later. Complications were rare; no uterine perforations were reported; and only 5.4% expelled the IUD (Parks MA, et al. J Pediatr Adolesc Gynecol. 2020; S1083-3188(20)30223-0. Online ahead of print.).

Intrauterine devices have been demonstrated to be safe and effective with results comparable to, or better than, hormone therapy. They are underutilized in teenagers but should be considered an option. If you are uncomfortable placing the device yourself, refer the patient to a gynecologist.

Appendectomy successfully averted in child considered at high surgical risk

A recent case report describes how appendicitis in a 9-year-old child with sickle cell disease was handled effectively with nonsurgical treatment.

The child, who has sickle beta zero thalassemia and moderate persistent asthma, visited an emergency department because of lower back, chest, and abdominal pain that had not responded to ibuprofen. Doctors diagnosed vasoocclusive crisis, and the child was given intravenous fluids and analgesia. Abdominal ultrasound did not visualize the appendix, and results of abdominal computerized tomography were consistent with acute appendicitis without perforation.

Considered a high surgical risk, the child was given medical therapy, including ciprofloxacin and metronidazole, and after a day of not eating was transitioned to a full liquid diet. By the fifth day of hospitalization his respiration had improved significantly, and he was discharged on day 6. A year later, his abdominal pain had not returned (Sahib S, et al. J Pediatr Hematol Oncol. March 3, 2020. Online ahead of print.).

Although rarely discussed in pediatric literature, using medical therapy with early introduction of antibiotics for acute appendicitis is not a new concept. Given how easily and relatively risk free appendectomy is to perform (especially laparoscopically), surgery is still the standard of care. However, keep an open mind about medical treatment if a surgeon believes that operating might be the greater risk.
Newborn’s rash involves eyes and nose

DEEPANK SAHNI, MD; NADEEM SHABBIR, MD

A healthy 11-day-old male infant is brought to the pediatric clinic for evaluation of rash. The rash started with a 2-mm papule on the left medial epicanthal fold 4 days before the clinic visit (Figure 1). The mother had scratched it, trying to pop the papule. The next day, the infant developed multiple erythematous papules and pustules medial to the left eye with sparing of the eye. A day before coming to the clinic, the rash had spread to the upper left eyelid and the nasal bridge (Figure 2).

The patient is asymptomatic and without fever or any sick contacts. The rest of his skin is clear. His mother has no history of genital herpes or oral lesions. No one has kissed the baby. The patient is being fed both breast milk and formula, with vitamin D supplementation. He usually has 6 to 7 wet diapers a day and passes stools around 4 to 5 times a day.

The patient was born via repeat cesarean delivery at 39 weeks’ gestation to a 39-year-old gravida 3 para 2 woman. The mother’s laboratory was unremarkable, including negative tests for human immunodeficiency virus (HIV), hepatitis-B surface antigen, and syphilis screen, group B Streptococcus, gonorrhea, and chlamydia. The mother had no active herpetic lesions during pregnancy.

The rupture of the membranes was at the time of the cesarean delivery. Apgar scores were 9 and 9 at 1 and 5 minutes, respectively. Postnatal resuscitation was not required. Both maternal grandparents have diabetes mellitus type 2. The mother lives with 2 families in the house, the grandfather smokes outside the house, and there are no animals in the house. Her immunizations are up-to-date.
Examination
The physical examination revealed normal vital signs and a rash on the patient’s face comprised of multiple 1-mm to 2-mm pustules on erythematous base involving the medial upper and lower eyelids bilaterally (Figure 3). The involvement was more on the left side, bridge of the nose, and contiguous lower mid-forehead. There was no discharge or any oozing from the rash. There were no oral or conjunctival lesions. The rest of the examination was unremarkable.

Differential diagnosis
Some articles have described neonatal cephalic pustulosis as a separate entity from neonatal acne, based on the absence of comedones and the presence of pustules surrounded by an erythematous halo. Other differential diagnoses (Table) are as follows:

**ERYTHEMA TOXICUM NEONATORUM**
Erythema toxicum neonatorum is rarely present at birth and may begin after 24 hours of life. It can appear anytime from birth to 2 weeks and usually lasts for several days to weeks. Rash is polymorphous and usually does not involve the palms and soles. Scrapings of pustules will reveal a large number of eosinophils. No treatment is necessary.

**TRANSIENT NEONATAL PUSTULAR MELANOSIS**
Transient neonatal pustular melanosis is more common in blacks and generally present at birth but rarely appears after birth. It usually resolves within 24 to 48 hours and can involve the palms and soles. Scraping of the pustules can show neutrophils. No treatment is necessary.

**STAPHYLOCOCCAL PUSTULOSIS**
Staphylococcal pustulosis is a common bacterial cause of pustular skin lesion that is usually localized to the periumbilical area, neck fold, and diaper area. Rarely it may be generalized. It presents as cutaneous erythema followed by peeling of skin and can cause significant complications and require prompt treatment. Gram stain of the scrapings can detect the bacteria. Treatment with appropriate antibiotics is recommended to reduce mortality.

**HERPES SIMPLEX VIRUS**
Herpes simplex virus (HSV) is usually accompanied by a history of HSV-2 in the mother. It generally manifests as grouped vesicles on erythematous base present anywhere on the body but mostly localized to the eye, skin, and mouth. Tzanck preparation can show multinucleated cells but a viral culture is the gold standard. Treatment with systemic acyclovir is recommended to prevent disseminated or central nervous system (CNS) spread.

**EOSINOPHILIC PUSTULOSIS**
Eosinophilic pustulosis presents as recurrent white-to-yellow pustules on the scalp or forehead that usually crust within 2 to 3 days but can last for years. There is some association with immunodeficiency. Giemsa stain can be done, which shows eosinophils predominance. It can be treated with topical corticosteroids or erythromycin.
ACROPUSTULOSIS OF INFANCY
Acropustulosis of infancy presents as a chronic recurrent eruption of vesicles and pustules on the hands and feet usually lasting for hours after birth, but it can occur anytime during infancy. The lesions usually disappear in 10 days but can reappear every month for the first 3 years. These erythematous papules can progress to intensely itching pustules in other parts of the body and usually require symptomatic treatment.

MILIARIA PUSTULOSIS
Miliaria pustulosis can be divided into 2 types—miliaria rubra and miliaria crystalline—within the first week of life. It presents as a polymorphous rash on the face, trunk, and intertriginous areas. It is precipitated in warm weather as excess sweating can cause obstruction of the eccrine duct. No treatment is necessary but cool baths and breathable fabrics are helpful.

CONTINUED ON PAGE 16
With kids home and parents looking for things to do that include “social distancing,” more families will take to the outdoors. The only thing, ticks don’t play by the same rules, so Lyme disease could end up on the rise. When patients aren’t feeling well, anxiety levels could be especially high — and now more than ever they’ll ask to be tested. Sofia 2 Lyme FIA uses a finger-stick whole blood sample to provide accurate, objective and automated results in as few as 3 minutes, getting practitioner and anxious patient on a path to treatment much sooner.

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Congenital candidiasis can present at birth or may appear after a few days as macules, papules, and pustules over the body but sparing the diaper area. It usually involves the palms and soles and can cause yellowish discoloration of fingernails with paronychia. Treatment is topical antifungal.

Hospital course
The infant was seen in the clinic and subsequently admitted to the hospital due to suspected herpes simplex infection (Figure 4). He was started on intravenous acyclovir 60 mg/kg/day divided Q8 hourly. Bacitracin ointment was applied topically on the rash twice a day. The viral culture was done from the wound specimen. Ophthalmology consultation was obtained, and they confirmed that there was no involvement of the eye. The following tests were sent: herpes viral PCR, Tzanck smear, and direct fluorescent antibody (DFA) test.

On the second day of admission, the pustules were larger and the red base more confluent (Figure 5). Because of concern for HSV, the Infectious Disease service was consulted and upon their suggestion fungal stain for potassium hydroxide (KOH) and cultures were sent. Intravenous acyclovir was continued and bacitracin ointment was replaced with miconazole. Final results showed negative fungal and viral cultures, the KOH stain was negative, and HSV PCR was not detected. Acyclovir was discontinued. The rash started to improve (Figure 6) and the patient was discharged home on miconazole ointment.

Diagnosis of neonatal cephalic pustulosis
Neonatal cephalic pustulosis usually develops during the first month of life and is characterized by uniform small papules and pustules on a red base involving the face and neck. It is related to the stimulation of sebaceous glands by maternal androgens. Histologic examination demonstrates an inflammatory infiltrate of primarily neutrophils and yeasts of the genus Malassezia (M). Some have suggested that neonatal cephalic pustulosis results from an inflammatory response to this yeast. Higher colonization is associated with increased severity of pustulosis. Most cases resolve spontaneously in several weeks without treatment but treatment with anti-yeast topical therapy may hasten resolution.

Neonatal cephalic pustulosis can be differentiated from neonatal acne by the presence of monomorphic lesions, the absence of comedones or nodular lesions, and the absence of a follicular distribution. The following criterion was suggested to define this entity: (a) pustules on face and neck; (b) age at onset, younger than 1 month; (c) isolation of M furred by direct microscopy in pustular material; (d) elimination of other causes of pustular eruption; (e) response to topical ketoconazole therapy.

Management
Treatment usually is not required as neonatal cephalic pustulosis is self-limiting. In severe cases, ketoconazole cream 2% or other topical antifungal agents and hydrocortisone cream 1% can be used.

Patient outcome
The patient was reevaluated in clinic a week after hospital discharge, and the rash was almost completely resolved with a fine ring of desquamation (Figure 7). Routine visits after that showed no residual rash.

COMMENTS?
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CLINICAL FEATURE

Multisystem inflammatory syndrome in children associated with COVID-19

Children who at first did not appear to contract COVID-19 have been found to exhibit a more serious illness that has now been reported worldwide. Two experts offer guidance on recognizing and treating multisystem inflammatory syndrome in children (MIS-C).

STANFORD T SHULMAN, MD; LEONARD R KRILOV, MD

Since the first report of an outbreak of respiratory disease in Wuhan, China, in December 2019 caused by a novel coronavirus (SARS-CoV2), coronavirus disease (COVID-19) has reached pandemic proportions. As of June 6, 2020, there were 6,663,304 cases and 392,802 deaths reported worldwide, with 1,891,690 cases and 109,192 deaths reported in the United States. Children and infants have been relatively spared from severe COVID-19, with pediatric cases accounting for less than 2% of COVID hospitalizations.

However, in late April, reports began to emerge of a multisystem inflammatory syndrome in children (MIS-C) related to SARS-CoV-2 infection. The Centers for Disease Control and Prevention (CDC) established the following definition for MIS-C:

- An individual aged 21 years and younger with fever for 1 or more days, laboratory evidence of inflammation, and illness requiring hospitalization with multisystem (2 or more) organ involvement (cardiac, renal, hematologic, gastrointestinal, dermatologic, neurologic), AND
- No alternative plausible diagnosis, AND
- Evidence of current or recent SARS-CoV-2 infection by reverse transcription polymerase chain reaction (RT-PCR), serology or antigen test, or exposure to a suspected or confirmed COVID-19 case within the 4 weeks prior to the onset of symptoms.

This definition provides a starting point for addressing this newly described hyperinflammatory syndrome with COVID-19, but it is also overly broad without adequately defining the nature of the multisystem involvement and only requiring 1 or more days of fever. The very elevated inflammatory (C-reactive protein [CRP], ferritin, triglycerides) and myocardial markers (N-terminal pro B-type natriuretic peptide [NT-proBNP] and troponin) and associated thrombocytopenia and lymphopenia do appear to be useful in consideration of a child with possible MIS-C.
MIS-C case series

Initial series of cases compatible with the diagnosis of MIS-C have been published from Europe. Ripha-gen and colleagues described 8 previously healthy children aged 4 to 14 years from Evelina London Children’s Hospital who presented with hyperinflammatory shock and features similar to atypical Kawasaki disease (KD), KD shock syndrome (KDSS), or toxic shock syndrome (TSS) in mid-April 2020. Of the 8 cases, 6 were children of African-Caribbean descent, most were teenagers, and 5 were males. All tested negative for SARS-COV2 by PCR but all had detectable antibodies to the virus.

Prominent clinical features in these cases included high fevers, gastrointestinal symptoms, and shock requiring mechanical ventilation in 7 of the cases, and a lack of respiratory symptoms. Laboratory parameters were notable for elevated CRP, procalcitonin, ferritin, D-dimers, triglycerides, troponin, and NT-proBNP. All were treated with intravenous immunoglobulin (IVIG), pressors, and antibiotics. Six received aspirin. One death occurred in a child with refractory shock and an arrhythmia requiring extracorporeal membrane oxygenation (ECMO) who developed a cerebrovascular infarct. One child developed a giant coronary aneurysm. The others were discharged from intensive care in 4 to 6 days and recovered.

A series of 10 children aged 3 to 16 years (mostly teenagers) from Bergamo, Italy, presenting between February 18 and April 20, 2020, with what the authors labeled as severe Kawasaki-like disease was published in the Lancet on May 13, 2020. By definition, these children met the 2017 American Heart Association criteria for KD or incomplete KD with 5 or more days of fever, compatible rash, and mucous membrane findings, but the overall picture was not consistent with classic KD.

Additionally, diarrhea was reported at presentation in 6 of the 10 children. Two of the children were positive for SARS-CoV2 by PCR; 8 were positive for SARS-CoV2 antibodies; and 2 were negative by PCR and serologic testing. Laboratory testing was notable for increased inflammatory markers, lymphopenia and thrombocytopenia (8/10 for each), increased triglycerides, increased ferritin, elevated proBNP (10/10), and troponin (5/9 tested). Five of the 10 presented in shock and 5 met criteria for macrophage activation syndrome (MAS). All received IVIG and aspirin; 8 of 10 were administered adjunctive steroids. All the children recovered and continue to be followed for development of coronary aneurysms.

More recently, a large French series of 35 patients with MIS-C was recently published in Circulation. These previously healthy children were cared for at 1 Swiss and 12 French hospitals from March 22 to April 30, 2020, utilizing the criteria of fever, cardiogenic shock or left ventricular ejection fraction (LVEF) less than 50%, and elevated CRP. The median age was 10 years with only 1 of 35 aged younger than 5 years and 19 of 35 aged from 11 to 16 years. SARS-CoV-2 testing in this group was positive in 31 of 35, with RT-PCR positive in 14 of 35 (12 nasopharyngeal and 2 fecal) and positive serology in

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### TABLE

**MULTISYSTEM INFLAMMATORY SYNDROME (MIS-C) VS KAWASAKI DISEASE**

<table>
<thead>
<tr>
<th>MIS-C</th>
<th>KAWASAKI DISEASE</th>
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<tbody>
<tr>
<td>Mean age 10-11 y</td>
<td>Mean age 2 y</td>
</tr>
<tr>
<td>Individuals with African heritage appear at highest risk</td>
<td>Asians at highest risk</td>
</tr>
<tr>
<td>Severe abdominal pain</td>
<td>Less severe GI complaints</td>
</tr>
<tr>
<td>Myocardial dysfunction/myocarditis</td>
<td>Coronary artery abnormalities (25%-60% in Kawasaki shock syndrome)</td>
</tr>
<tr>
<td>Acute kidney injury</td>
<td>Renal involvement very rare</td>
</tr>
<tr>
<td>NT-pro-BNP and troponin ↑↑</td>
<td>Not often reported (myocardial dysfunction less severe) but generally normal to mildly increased</td>
</tr>
<tr>
<td>Ferritin, triglycerides, and CRP ↑↑</td>
<td>Same, but less severe</td>
</tr>
<tr>
<td>Platelet count ↓ and normalizes with recovery</td>
<td>Marked thrombocytosis by day 10-14</td>
</tr>
<tr>
<td>Lymphopenia</td>
<td>Lymphopenia not described</td>
</tr>
<tr>
<td>Association with SARS-CoV2 infection (2-4 wk prior)</td>
<td>Specific etiology still unknown; no association with SARS CoV2</td>
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</table>

Abbreviations: CRP, C-reactive protein; GI, gastrointestinal; NT-proBNP, N-terminal-pro type b natriuretic peptide; SARS-CoV2, severe acute respiratory syndrome coronavirus.
infectious disease

30 of 35 including IgG positive in 28. In 13 of 35 patients there was a recent family member with viral symptoms.

The clinical features of these 35 patients included fever and asthenia in all; 83% had abdominal pain associated with diarrhea and/or vomiting; 65% had respiratory distress; and some had rash or lip inflammation. None met the diagnostic criteria for KD. Twenty-nine of 35 were admitted to the pediatric intensive care unit (PICU) with cardiogenic shock, two-thirds were mechanically ventilated, and 10 of 35 received circulatory assistance with venous-arterial ECMO.

Echocardiographic features included 10 of 35 children with LVEF less than 30% and 25 of 35 with LVEF between less than 30% to 50%. Global left ventricular hypokinesis was present in 31 of 35 and segmental left ventricular hypokinesis in 3 more. The evolution of LVEF impressively improved rather quickly, with mean (and SD) LVEF equal to 32% (9%) at baseline in all 35, improved on day 3 to 52% (10%) in 23, and on day 7 to 60% (6%) in 34 patients. Six of 35 patients had a coronary artery z-score greater than 2.0, although 5 of these 6 involved the left main coronary artery (of little significance per recent guidelines) and 1 involved the right coronary artery. No coronary aneurysms were detected.

Laboratory features of these patients were very striking and included median CRP of 24 mg/dL (range 15-31); high-sensitivity (hs) troponin of 347 ng/mL (range 186-1267; normal, <26 ng/mL); NT-proBNP, 41,000 pg/mL (range, 35,000-52,000; normal, <300 pg/mL); D-dimers, 5284 ng/mL (range 4000-9000; normal, <500 ng/mL); and interleukin (IL)-6, 135 pg/mL (range 87-175; normal, <8.5 pg/mL).

Treatment of the 35 patients included 28 who received inotrope(s), 25 treated with IVIG, 12 who received IV steroids (as in patients with high-risk KD), 3 received anakinra, and 25 of 35 were treated with heparin. The outcomes of the 35 children are remarkable in that all survived after a median 7-day PICU stay and 10-day total hospital stay. Twenty-five of 35 were at home with LVEF greater than 60% at day 7 with an additional 3 children at home with LVEF greater than 45%. LV function normalized in 25 of 35 patients at a mean of 2.2 days. No patients experienced thromboses or emboli.

A second similar French series of 21 patients included 12 (57%) who had at least 1 parent from sub-Saharan Africa or a Caribbean island. In the United States, the majority of cases of MIS-C have been reported from New York. The New York State Department of Health has reported 202 cases of MIS-C with 3 deaths from late April 2020 through June 6, 2020. Blacks are overrepresented, accounting for 31% of the cases compared with 22% for white cases, 17% other, 26% unknown, and 3% Asian. The median age of these children is about 9 years.

Comparison of MIS-C with KD
Whereas MIS-C patients may present with one or more features reminiscent of KD, there are many other, often strikingly different features of the 2 conditions, supporting the concept that they are fundamentally different illnesses (Table). The study from Italy5 by definition selected children with KD-like features, yet many differences in these cases from classic KD are apparent.

There are markedly different demographic features in these 2 conditions, with very distinctive age and racial distributions. Whereas the median age of KD children is 2 years and 80% are aged younger than 5 years, MIS-C patients are much older with a median age of 10 to 11 years in most series and include many adolescents, teenagers, and even a few young adults. Additionally, the attack rates for KD are very much higher among Japanese, Korean, and Chinese children compared with other racial groups whereas Asian populations have been very underrepresented in MIS-C reports to date despite marked SARS-2 exposures. Several of the series of MIS-C patients strongly suggest overrepresentation of children of African backgrounds.

Although some of the dermatologic and mucosal features of KD may be present, MIS-C patients typically present with much more severe abdominal complaints of pain with

IN MEMORIAM

This article is dedicated to the memory of Dr. Tomisaku Kawasaki of Tokyo who died June 5, 2020, at the age of 95 years. Dr. Kawasaki was an outstanding clinical general pediatrician. While serving as the long-time director of Pediatrics at the Japanese Red Cross Medical Center in Tokyo in the 1960s, he astutely recognized that he was encountering febrile children with an apparently new syndrome, one that now bears his name. He spent the last 5 decades of his life educating the world and researching the mysteries surrounding Kawasaki disease.
Testing without TRACKING is not enough!

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diarrhea and/or vomiting compared with KD patients, as well as manifesting multiorgan system involvement and cardiogenic shock. A small (approximately 2%) subset of KD patients can develop KDSS but they often have significant coronary abnormalities as well. The latter patients are somewhat clinically similar to those with TSS.

Additionally, the hallmark of KD is the development of coronary artery abnormalities, whereas evidence of significant myocardial involvement is mainly limited to the small group of KDSS patients. In striking contrast, MIS-C patients typically present with shock and with moderate-to-severe myocardial dysfunction with low LVEFs, and only a relative handful have had coronary abnormalities, often mild and of unclear significance.

By definition, MIS-C patients have evidence of recent SARS-CoV-2 infection, while KD patients do not. Some of the laboratory features of MIS-C strongly resemble those of MAS such as elevated ferritin, D-dimers, triglycerides, and some are indicative of myocardial dysfunction such as elevated troponin and very elevated NT-proBNP levels in the greater-than-30,000 pg/mL range. In addition, MIS-C patients typically have lymphopenia, neutrophilia, thrombocytopenia, and very high CRP levels on presentation, unlike KD patients who rarely share these abnormalities and have more modestly elevated CRP levels.

Overall, the picture of MIS-C in many respects closely resembles the later phase seen in many adult COVID-19 patients of “cytokine storm,” with hyperinflammation, multiorgan damage including kidney and myocardium, with features of MAS and TSS. It is not at all clear why MIS-C patients have almost always had no early COVID-19 manifestations and that their illnesses typically present 4 to 6 weeks after the peak COVID-19 activity in a region. In this regard, MIS-C can be considered a postinfectious illness. Of great interest is the fact that MIS-C patients typically respond very well to IVIG with or without IV steroid, probably by effectively modulating cytokine activation. The role of additional therapies including anticoagulation with low-dose molecular heparin, aspirin, or the IL-1 inhibitor anakinra remains speculative at present.

In conclusion

In summary, the newly described MIS-C is quite distinct from KD. It is likely a postinfectious inflammatory syndrome as evidenced by the delay in onset from the peak of COVID cases, by the time from the apparent exposure to SARS-CoV-2 to onset of symptoms in many of the reported cases, and by the very marked elevations in inflammatory and myocardial markers observed in these cases. Thus MIS-C may be analogous to the later phase of adult COVID-19 that is also characterized by cytokine storm that may include severe myocardial dysfunction, acute kidney injury, and laboratory markers of MAS.

**COMMENTS?** E-mail them to llevine@mhlfsciences.com

The authors have nothing to disclose in regard to affiliations with or financial interests in any organizations that may have an interest in any part of this article.

**MULTI SYSTEM INFLAMMATORY SYNDROME IN CHILDREN (MIS-C): A new wrinkle in COVID-19 infection**

First described in the United Kingdom in late April and since reported in Spain, Italy, France, and here in the United States, “Multisystem inflammatory syndrome in children (MIS-C)” has been confirmed/suspected in more than 200 children in at least 20 states, with 4 pediatric deaths reported. These serious infections mimic symptoms of Kawasaki disease and/or toxic shock syndrome and arise days after some children have experienced possible coronavirus exposure. Contemporary Pediatrics assembled a panel of experts in Infectious Disease for a webinar to discuss MIS-C and its ramifications for children.

The webinar is available on demand at ContemporaryPediatrics.com/MIS-C-webinar

YOU WILL LEARN:
- What MIS-C is and how it may mimic some of the findings in Kawasaki disease and/or toxic shock syndrome.
- How to recognize and treat MIS-C.
- How MIS-C is potentially related to COVID-19.

Don’t miss this informative discussion with Tina Q. Tan, MD, Feinberg School of Medicine, Northwestern University, and Ann & Robert H. Lurie Children’s Hospital of Chicago, Illinois, and Editor-in-Chief of Contemporary Pediatrics; Stanford T. Shulman, MD, Feinberg School of Medicine, Northwestern University, and Ann & Robert H. Lurie Children’s Hospital of Chicago; and Leonard R. Krilov, MD, New York University (NYU) Winthrop Hospital and NYU Long Island School of Medicine, Mineola, New York.
AAP issues guidance for managing infants born to mothers with COVID-19

Utilizing the current data known, the American Academy of Pediatrics (AAP) has issued guidance for caring for newborns who are born to mothers with COVID-19.

MIRANDA HESTER, EDITOR

There are questions about COVID-19 that remain unanswered, and many involve keeping both pregnant women and newborns safe during the hospital stay for birth. The American Academy of Pediatrics (AAP) has released new guidance for this situation.1

The guidance states that the disease does not appear to be as severe as influenza or other serious coronavirus diseases such as severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS), which often caused severe or fatal disease in pregnant women. Young children also continue to appear less likely to experience severe disease, but it is still possible. Limited case studies have shown that congenital or perinatal infections also are possible.

The important points in the guidance include:

- When possible, newborns should be separated following birth when the mother has COVID-19. If the family wants the infant to room in with the mother, they should be told about the potential risk of the child developing COVID-19.
- According to evidence available on March 30, 2020, SARS-CoV-2, the virus that causes COVID-19, has not been found in breast milk. Mothers with COVID-19 who have chosen to breastfeed their child can express the milk to be fed to the infant by uninfected caregivers.
- Infants born to mothers with COVID-19 should be tested for SARS-CoV-2 at 24 hours after birth and 48 hours after birth, if the child is still at the hospital. In care centers with limited testing abilities, individual risk/benefit decisions should be made to determine if testing is to be performed.
- Newborns who either have a documented SARS-CoV-2 infection or are at risk of postnatal acquisition of COVID-19 should get frequent outpatient follow-up for 14 days after discharge.
- If a newborn requires ongoing hospital care, the mother with COVID-19 should remain separate from the child until she has been afebrile for 72 hours without the use of antipyretics; improvement has been seen in respiratory symptoms; and negative results from 2 consecutive SARS-CoV-2 nasopharyngeal swab tests collected 24 hours apart or later have occurred.
- Following discharge, a mother with COVID-19 should maintain a distance of at least 6 feet and when in closer proximity use mask and hand hygiene until the mother has been afebrile for 72 hours without the use of antipyretics and at least 7 days have passed since the first symptom appeared.

The guidance will be changed as more information on SARS-CoV-2 and COVID-19 becomes available.

COMMENTS? E-mail them to ilevine@mjhlifesciences.com

REFERENCE

FDA approves VESIcare for pediatric use
New oral suspension treats neurogenic detrusor overactivity.

MIRANDA HESTER, EDITOR

The US Food and Drug Administration has approved Astellas Pharma US Inc.’s VESIcare LS (solifenacin succinate) oral suspension for use in treating neurogenic detrusor overactivity (NDO) in children aged 2 years and older. A tablet version of the drug was approved for treating overactive bladder in adults aged 18 years and older in 2004. The new treatment requires only once-a-day dosing.

Two clinical trials were used to establish the efficacy of VESIcare LS and included 95 pediatric patients with NDO aged 2 to 17 years. The studies were designed to measure the maximum amount of urine that the bladder could hold following 24 weeks of treatment. In study one, 17 patients aged 2 years to younger than 5 years were able to hold an average of 39 mL more urine following treatment. The second study included 49 patients aged 5 to 17 years who were able to hold an average of 57 mL more urine after treatment. Additionally, the researchers observed reductions in bladder pressure, number of incontinence episodes, and spontaneous bladder contractions in both studies.

The most common adverse effects were constipation, dry mouth, and urinary tract infection. Sleepiness or drowsiness has been reported with solifenacin succinate and patients of age who can drive should be advised to refrain from doing so until they know how VESIcare LS affects them. The recommended starting dose should not be exceeded in patients who also are taking strong CYP3A4 inhibitors. Anaphylaxis and angioedema have been reported. The drug should not be used in patients with gastric retention, uncontrolled narrow angle glaucoma, or hypersensitivity to VESIcare LS.

COMMENTS? E-mail them to llevine@mjhlifesciences.com

FDA approves VESIcare for pediatric use
New oral suspension treats neurogenic detrusor overactivity.

MIRANDA HESTER, EDITOR

Benzodiazepines are some of the most common pharmacologic tools used to treat anxiety disorders. Research has shown that they are linked to falls and fractures in older adults. A new investigation in Pediatrics examines whether there is a similar link in children and adolescents who take benzodiazepines.

Investigators used insurance claims from commercially insured children and young adults who had a recent anxiety disorder diagnosis and had initiated benzodiazepines or selective serotonin reuptake inhibitors (SSRIs). Each participant was followed until fracture, treatment discontinuation or switching, disenrollment, for 3 months, or until December 31, 2016.

There were 120,715 children and 179,768 young adults. Among the children, the crude fracture rates during treatment were 33.1 per 1000 person-years (PYS) for benzodiazepine initiators and 25.1 per 1000 PYS for SSRIs initiators. The risk was heightened among children who had initiated long-acting benzodiazepines in comparison with SSRIs. Researchers concluded that children treated with benzodiazepine merit caution to protect against fractures.

Does benzodiazepine increase fracture risk?
Benzodiazepine therapy has been linked to an increased risk of fracture in older adults. Does this risk apply to children?

MIRANDA HESTER, EDITOR

For reference, go to ContemporaryPediatrics.com/FDA-approval-for-NDO

For reference, go to ContemporaryPediatrics.com/benzodiazepine-and-fracture-risk
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The BioFire ME Panel has been shown to reduce the length of stay (LoS) by 2 days.\(^4\) The BioFire ME Panel has also been shown to help avoid unnecessary antibiotics and hospital admissions based on causative pathogens.\(^5\)\(^6\)

### BioFire® FilmArray® Gastrointestinal (GI) Panel

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When compared to traditional testing methods, the BioFire GI Panel demonstrated an 84% reduction in time to results while increasing overall pathogen detection.\(^7\)\(^8\) Additionally, patients tested with the BioFire GI Panel were 17% more likely to receive targeted rather than empirical therapy.\(^8\)

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A team of researchers is working to answer questions about a rare allergy to proteins found in certain foods that is widely misdiagnosed and misunderstood.

In a study published in the *Journal of Allergy and Clinical Immunology*, researchers investigated the symptoms, diagnosis, and conditions surrounding food protein-induced enterocolitis syndrome (FPIES) by interviewing the caregivers of more than 440 children with the condition.\(^1\)

Food protein-induced enterocolitis syndrome is a non–immunoglobulin E (IgE)-mediated food allergy impacting the gastrointestinal system. It typically presents with protracted vomiting followed by watery diarrhea 1 to 4 hours after eating a food that triggers the reaction. In severe cases, symptoms also may include lethargy, hypothermia, hypotension, and 15% of cases result in shock, according to the report.

Typically, FPIES is mistaken for other conditions, such as sepsis or infectious enteritis. Diagnosis of FPIES is difficult because there is no blood or skin testing available, according to the American College of Allergy, Asthma, and Immunology (ACAAI). Instead, diagnosis is made by noting reaction history and whether improvement occurs through avoidance of suspected trigger foods.

Study co-author Theresa A. Bingemann, MD, program director of Allergy and Immunology, and associate professor of Pediatrics and Medicine at the University of Rochester, New York, says FPIES can be both “dramatic and frightening” for caregivers because of the lack of understanding about the condition.

“Despite recent advances in food allergy research, current understanding of FPIES, including food triggers and risk factors, remains low. We found that avoiding multiple food groups due to FPIES was more common than previously reported, with over two-thirds of caregivers reporting their children avoided at least 2 food groups due to FPIES,” Bingemann says. “A large proportion of children in our cohort—20.3%—had a first-degree relative with FPIES, and having a first-degree relative with FPIES was significantly associated with the affected child avoiding multiple food groups.”

**Parent-reported triggers**
The research team sought to learn more about the disease by polling children and parents about triggers and manifestations about the condition.

Children usually begin to display symptoms of FPIES very early, either after the introduction of milk- or soy-based formulas or when solid foods—especially early grains—are introduced. Often, the first sign that something is wrong is poor growth or

20.3% of children in the study had a first-degree relative with FPIES.
a diagnosis of failure to thrive, according to the ACAAI. The fact that vomiting and diarrhea occur so many hours after exposure makes it difficult to link the symptom to the food. How rare the condition is also contributes to the lack of understanding of FPIES, with only 0.015% to 0.7% of children affected. These small numbers mean there is little information on demographics, comorbidities, food triggers, types of reactions, and risk factors.

In this study, half the children were female, and the majority—86.2%—were white. More than half were atopic, with allergies not associated with the body part in contact with the allergen, says study co-author Lisa Bartnikas, MD, an attending physician in Allergy and Immunology at Boston Children’s Hospital and a pediatric instructor at Harvard Medical School, Boston, Massachusetts.

“Over half of children in our study had parent-reported other atopic conditions including allergic rhinoconjunctivitis, asthma, atopic dermatitis, and IgE-mediated food allergy,” Bartnikas says. “Pediatricians should be aware of this and ask about relevant symptoms periodically. It is important to be aware that FPIES and IgE-mediated food allergies can co-exist in the same patient, and IgE-mediated food allergy was reported in over a quarter of children in our study. If there are concerns for food allergy in a patient, pediatricians should ask about symptoms of both FPIES and IgE-mediated food allergy.”

In addition to the 54.8% of children in the study who were affected with atopy, 47.4% of their parents were affected as well. Other IgE-mediated food allergies besides FPIES were present in about a quarter of the study group, and 2.5% of parents also had been affected by FPIES. Most of the affected parents were mothers. Another familial trait noted was that 8.9% of families had more than 1 child affected by FPIES. Overall, 20.3% of children in the study had a first-degree relative with FPIES.

**Avoidance of certain food groups because of FPIES**
The study found that the median age of the participants was 2 years, and most of them—60%—avoided grains. Other foods commonly avoided in the children with FPIES were cow’s milk (52.4%), followed by 42.7% avoiding vegetables, and 38% avoiding fruits. Among fruits avoid-
ed, avocados were most common, and those who avoided avocado usually avoided bananas, too.

Most children in the study avoided at least 2 food groups because of FPIES. Multiple food group avoidance was increased in children who also had a first-degree relative with FPIES.

“Our study revealed a higher percentage of children with multiple food FPIES than has been previously reported and the most common fruit avoided due to an FPIES reaction was avocado, which was previously thought to be a low-risk food. We also found avoiding avocado was associated with increased likelihood of avoiding banana,” Bartnikas says. “These findings may reflect the self-reported nature of our study, the fact that caregivers who observed an FPIES reaction to one food then tried low-risk foods saw a new emerging allergen in FPIES. It is important to note that FPIES reactions can be seen with many different foods, even if they were not previously reported.”

Whereas grains overall were most commonly associated with FPIES reactions, the study team uncovered more details. Oat, rice, and wheat were the most commonly avoided grains. Avocado, banana, and apple were the most commonly avoided fruits. Both bananas and avocados are foods that are introduced early in the solid foods cycle, and the research team says more research is needed to determine why these foods are triggering reactions. Other fruits identified in the study that require further investigation as to whether they are over-avoided or have some role in FPIES reactions include blueberries, strawberries, coconuts, nectarines, honeydew, and cherries. In the vegetable category, sweet potatoes, peas, and corn were avoided most, and for meats, it was beef, chicken, and pork. Most children in the study group avoided 3 food groups, with only a third of the cohort eliminating a single food group. Children with family members who had FPIES were more likely to avoid multiple food groups.

Symptoms were reported fairly consistently across the study groups, with 94.3% of children in the study having vomiting within 1 to 4 hours of ingesting an offending food as the most common reaction. Lethargy, pallor, a decrease in activity, and diarrhea were other symptoms. In cases of acute reactions, roughly one-third reported hypotension and another third reported hypothermia. About half of the conti

**“We hope that the knowledge of the impact of FPIES will facilitate early referral to an allergist experienced in FPIES management.”**

—THERESA A. BINGEMANN, MD

**CONTINUED ON PAGE 35**
Using biomarkers to predict CAP severity

Will what works in adults work in pediatric cases? MIRANDA HESTER, EDITOR

Biomarkers have been a way of predicting community-acquired pneumonia (CAP) disease severity in adults. A new study in Pediatrics looks at whether biomarkers can help predict severe disease courses in children as well.1

Investigators ran a prospective cohort study of children aged 3 months to 18 years who had CAP and received treatment in the emergency department. Disease severity was divided into 4 categories: mild, discharged from the hospital; mild-moderate, hospitalized but not moderate-severe or severe; moderate-severe, hospitalized and received intravenous fluids or supplemental oxygen, or complicated pneumonia; or severe, intensive case, vasoactive infusions, chest drainage, or severe sepsis.

The cohort included 477 children and there were no statistical differences in median absolute neutrophil count, C-reactive protein (CRP), procalcitonin, and white blood cell count. Investigators found that no biomarker showed adequate discriminatory ability between severe and nonsevere disease. After adjusting for age, antibiotic use, fever duration, and viral pathogen detection, CRP was linked with moderate-severe disease. Procalcitonin and CRP had good discrimination of children with sepsis with vasoactive infusions and empyema requiring chest drainage, but prevalence of these outcomes was found to be low. ■

COMMENTS? E-mail them to llevine@mhlfsciences.com

For reference, go to ContemporaryPediatrics.com/biomarkers-for-CAP

Medical history of teen EVALI patients differs

Teens’ e-cigarette/vaping product use–associated lung injury (EVALI) is serious. MIRANDA HESTER, EDITOR

Before the COVID-19 crisis began, one of the biggest public health issues was the proliferation of e-cigarette, or vaping, product use–associated lung injury (EVALI). A recent report in JAMA Pediatrics looked at how adolescent patients with EVALI differed from adult patients with EVALI.1

Investigators used the surveillance data reported to the Centers for Disease Control and Prevention during the 2019 EVALI outbreak. There were 2155 total cases, which included 360 adolescents who were either hospitalized or deceased. There were 859 young adult cases and 936 adult cases.

The adolescents reported using any tetrahydrocannabinol (THC)-containing (81.7%) and nicotine-containing (62.4%) products, and both (50.8%) types of e-cigarette or vaping products. Adolescents were more likely to report getting their nicotine-containing and THC-containing e-cigarette or vaping products than young adults. Behavioral, mental, or emotional disorders were common. A history of attention-deficit/hyperactivity disorder was found to be nearly 4 times more likely among teenagers than adults. Similarly, a history of asthma was reported by more adolescents than adults.

The investigators urge clinicians and public health officials to continue discussing EVALI and the link to THC-containing e-cigarette or vaping product use. A confidential substance use history to discover e-cigarette or vaping use is recommended. ■

For reference, go to ContemporaryPediatrics.com/EVALI-in-teens
Telemedicine: Implementing telehealth into your practice

Contemporary Pediatrics® sat down with Andrew J. Schuman, Editorial Advisory Board member, clinical assistant professor of Pediatrics, Geisel School of Medicine at Dartmouth, Lebanon, New Hampshire, and practicing pediatrician, to discuss what he’s learned about utilizing telehealth during the COVID-19 pandemic and how it’s shaped his practice.

Read the full interview and more by visiting www.contemporarypediatrics.com/telemedicine

Managing Allergies: Advice and Education

In a study published in the Journal of Allergy and Clinical Immunology, researchers investigated the symptoms, diagnosis, and conditions surrounding food protein-induced enterocolitis syndrome (FPIES) by interviewing the caregivers of more than 440 children with the condition.

Read their findings and more by visiting www.contemporarypediatrics.com/allergy
Having a life-threatening food allergy doesn’t just present a physical threat to life—it’s also a constant threat to mental health.

In a commentary published in the *Annals of Allergy, Asthma, and Immunology*¹, experts at Northwestern University Feinberg School of Medicine and the Ann and Robert H. Lurie Children’s Hospital of Chicago share perspectives on how clinicians can address both the medical and psycho-social challenges facing children—and families—impacted by life-threatening allergies.

Whereas allergists are well versed with the diagnosis and treatment of the conditions they manage, little research has gone into the mental and emotional burden these severe allergies can have on children and their families. In interviews conducted among high-volume allergists, the commentators reveal that flexibility, and a good relationship between the clinician and families, as well as consistent education are key to helping families cope with severe allergies. Identifying problems accepting and managing a diagnosis is just as important as prescribing therapies.

“Pediatricians who treat children with food allergies must think about quality of life issues as part and parcel of having and managing food allergies,” says Lisa S. Lombard, PHD, a clinical psychologist and researcher in the Center for Food Allergy and Asthma Research at Northwestern and co-author of the study. “Children and families want to get sound and clear medical information about avoiding food allergens and managing food allergy-related anxiety, challenging social situations, and uncertainty about newly emerging immunotherapies. Families often turn to the Internet and social media for this information, so pediatricians really need to be an accessible and up-to-date medical resource for these families.”

**Knowledge is powerful**
The report adds that although younger children don’t always have anxiety associated with their allergies, their families do.

Research at Northwestern and co-author of the study. “Children and families want to get sound and clear medical information about avoiding food allergens and managing food allergy-related anxiety, challenging social situations, and uncertainty about newly emerging immunotherapies. Families often turn to the Internet and social media for this information, so pediatricians really need to be an accessible and up-to-date medical resource for these families.”

**Although younger children don’t always have anxiety associated with their allergies, their families do.**

Both for parents and children, particularly in terms of managing emergency allergic reactions and treatments. Anaphylactic reactions are a major source of anxiety, the commentators note, with auto-inject pens and the anaphylaxis itself stirring fear and uncertainty. However, the commentators suggest that reviewing these protocols and helping patients and their families feel ready to deal with these reactions can be a positive form of coping. Learning to properly administer epinephrine, and then doing it when needed, brings a sense of relief because the unknown was faced, and they feel better prepared to deal with the issue again in the future.

It’s important to recognize anxiety, as well as coping mechanisms, in both parents and children, the report notes. Education is a powerful tool in overcoming this anxiety, the team writes, adding that patients and parents who are misinformed about these allergies have a more difficult time coping. Clinicians may have to follow up with these families regularly, offering simple and repetitive information that is easy to digest. Consider the developmental stage of the child and the coping ability of the family, the team suggests.

“Managing food allergies will look different at different ages of development, so families need to be flexible and innovate. The important element is finding a balance, so that avoidance and concern can be adaptive, rather than nonproductive,” Lombard says. “Children frequently absorb their parents’ level of anxiety, so address safety and allergen avoidance measures in developmentally appropri-
ate ways that continue to give the message ‘We’ve got this!’ to the child. Advise families to look to evidenced-based resources. Find easy and accessible practices, such as role playing with your child, so they get more comfortable asking adults about who prepared the food, where it was made, and what the ingredients are.”

Further research
Lombard says her team is now using the interviews they conducted to help develop tried-and-true strategies that they can share with clinicians. “We are using the research as a starting point for developing interventions to specifically meet the psychosocial coping needs of families with food allergies. Clearly, ongoing communication and support from physicians about psychosocial food allergy management is fundamental,” she says. “From a psychological perspective, good stress management skills such as guided imagery, mindfulness, and regulated breathing, can offer additional and welcomed support so parents and children can better use the problem-solving parts of the brain without extra worry and anxiety.”

Open communication and consistent education are the hallmarks of managing patient and family anxiety and coping skills when it comes to life-threatening food allergies. Lombard says she hopes the commentary will help clinicians understand the role they play, in treating allergies and helping children and their families live their best life with them. “We hope that this report reminds physicians and health care providers who care for children and families with food allergies to consider the whole child,” she says. “Here are quality-of-life concerns that include worries and anxiety, social isolation, finding reliable and current treatment advice, and more. When these issues improve, overall patient outcomes can improve.”

COMMENTS? E-mail them to llevine@mjh lifesciences.com

Ms Zimlich is a freelance writer in Cleveland, Ohio. She has nothing to disclose.

CORONAVIRUS: ACP makes recommendations to keep COVID-19 flexibilities

The American College of Physicians (ACP) has made several recommendations to major US health insurers and health insurance associations to keep COVID-19 flexibilities in effect after the pandemic has passed, according to a news release.

The recommendations came in letters from Jacqueline W. Fincher, MD, MACP, president of ACP, to the presidents and CEOs of the Blue Cross Blue Shield Association, UnitedHealth Group, the National Association of Insurance Commissioners, and America’s Health Insurance Plans.

“If private payers do not join with the Centers for Medicare & Medicaid Services to provide physician practices with the critical support they need in this unprecedented crisis, hundreds if not thousands of practices across the country may be at real financial risk of closing, leaving a critical shortage of healthcare services at a time we can least afford it,” Fincher wrote.

The ACP’s recommendations include:
- Extending telehealth and telephone flexibilities paid at the same rate as in-person services regardless of platform.
- Direct financial support including reimbursing waived patient cost-sharing responsibilities and direct payment relief payments.
- Developing more alternative payment models that move away from inconsistent fee-for-service, especially those offering fixed, periodic prospective payments.
- Extending and expanding current administrative flexibilities, including broad reprieves from prior authorization requirements, which take time and resources away from patient care.

“These important changes will enable physicians and their care teams to adapt to the new environment and deliver patients the care they need in a manner that helps to protect their safety, as well as those around them,” Fincher wrote. “Practices will not recover from this crisis overnight. At a minimum, these changes should extend at least through the end of 2021, or until such a time when effective vaccines and treatments are widely available, with an option to extend further based on the experiences of patients and physicians.”
Itchy black spots: poison ivy or something else?

SIVAN KASSIFF, MD; ROBIN P GEHRIS, MD

A 16-year-old girl presents for evaluation of a rash on her left forearm (Figure). Two days earlier, she was volunteering in the community, cleaning up a park by clearing plants and placing them in recycling bags, when she experienced sudden onset of a burning sensation on her left forearm associated with 2 enlarging red areas that became increasingly pruritic and edematous. The following day, she developed black macules on her forearm that she was unable to wash off.

Discussion
Allergic contact dermatitis as a result of poison ivy, poison oak, and poison sumac is an exceedingly common cause of Type IV hypersensitivity reaction. It results from allergens contained in urushiol, the resinous sap found in the stems, roots, and leaves of plants belonging to the genus *Toxicodendron* when the plants are damaged. This reaction is characterized by a pruritic, erythematous rash, with papules and vesicles often in a linear distribution.

“Black-spot” poison ivy is an uncommon presentation of this common reaction, and as such may cause diagnostic confusion and alarm. Black enamel-like deposits are often seen on the surface of the plants themselves in areas of trauma, and this can be used in the field to identify plants from the genus *Toxico-
dendron. Leaves crushed between sheets of white paper cause the paper to turn dark brown within minutes and black by 24 hours as a result of oxidation of the urushiol. It is thought that this reaction occurs due to oxidation of concentrated urushiol under certain conditions, and it is reproducible on application of this substance to the skin, initially with black discoloration and after several days developing a lacquer-like appearance. These spots are adherent and cannot be removed.

Interestingly, the resin has the potential to cause dermatitis indefinitely and cannot be removed from clothing by washing. Histologically, biopsied specimens demonstrate the resin on the surface of the stratum corneum with a neutrophilic infiltrate and areas of epidermal necrosis beneath it (in contrast to the typical presentation of poison-ivy dermatitis without black discoloration, in which biopsy reveals superficial perivascular infiltration with no evidence of resin and no associated necrosis). This suggests both an irritant and allergic contact dermatitis.

There have been several case series of such “black-spot” poison ivy dermatitis, with patients often initially presenting concerned about more serious pathology, including melanoma. Treatment mirrors that as for classic contact dermatitis and includes topical steroids and oral antihistamines with the addition of oral steroids only as needed in extensive cases or those that involve the face or groin.

**Patient outcome**

The patient was advised of the diagnosis and treated with triamcinolone 0.1% topical ointment, with topical mupirocin for any open areas. The following day, after a swim meet, she re-presented to the emergency department with new red raised eruptions around her eyes and neck, likely from contact with her arm or a delayed eruption from the original contact. She was treated with oral prednisone and did not require further follow-up.

**For references, go to ContemporaryPediatrics.com/dermcase-0720**

**COMMENTS?** E-mail them to llevine@mjhiflasciences.com

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**Dr Kassiff** is a pediatric resident, University of Pittsburgh Medical Center (UPMC) Children’s Hospital of Pittsburgh, Pennsylvania.

**Dr Gehris** is chief, Pediatric Dermatology, medical director, Pediatric Teledermatology, and clinical associate professor of Dermatology, UPMC Children’s Hospital of Pittsburgh.

**Dr Cohen**, section editor for Dermcase, is professor of Pediatrics and of Dermatology, Johns Hopkins University School of Medicine, Baltimore, Maryland.

Dr Kassiff and Dr Cohen have nothing to disclose in regard to affiliations with or financial interests in any organizations that may have an interest in any part of this article. Dr Gehris reports she is on the speaker’s bureau for Sanofi Regeneron but that the affiliation does not pertain to this article. Vignettes are based on real cases that have been modified to allow the authors and section editor to focus on key teaching points. Images also may be edited or substituted for teaching purposes.

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**COVID-19: It’s not the same-old same old!**  
CONTINUED FROM PAGE 6

COVID-19 pandemic, remember to get outside once in a while and enjoy the sunshine. Summer really can be the best time of the year.

Please stay safe and well. I welcome your suggestions, comments, and questions.

**With warmest regards,**  
Tina

**Tina Q Tan,**  
Editor-in-Chief

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parents polled reported their child had met the criteria for a severe FPIES reaction in the past; 56% reported seeking treatment at the hospital. About 21% of children who sought hospital care for severe reactions were admitted. When hospital care was required, children were often treated with ondansetron for vomiting, intravenous fluids for hydration, and oral steroids to help control allergic reaction.

The majority of survey participants were parents, and most had a written emergency plan for FPIES. Additionally, the report found that less than half of the children with FPIES attended school or daycare, and more than half were kept home over concerns for problems with FPIES.

Bingemann notes, “In FPIES, identifying food triggers and counseling families remains challenging. Our study offers insights into the demographics of those affected, association with other atopic conditions, familial predisposition, and burden of dietary restriction,” she says. “We hope that the knowledge of the impact of FPIES will facilitate early referral to an allergist experienced in FPIES management, leading to ‘delabeling’ of some of the allergies if appropriate, increased guidance, and improve quality of life.”

COMMENTS? E-mail them to llevine@mjhiflsciences.com

Ms Zimlich is a freelance writer in Cleveland, Ohio. She writes regulary for Contemporary Pediatrics and sister publications Managed Healthcare Executive and Medical Economics. She has nothing to disclose in regard to affiliations with or financial interests in any organizations that may have an interest in any part of this article.

For reference, go to ContemporaryPediatrics.com/guidance-for-FPIES

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