ABSTRACTS IN URGENT CARE

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Each month the Urgent Care College of Physicians (UCCOP) provides a handful of abstracts from or related to urgent care practices or practitioners. Sean McNeeley, MD, leads this effort.

Fatigue and inappropriate antibiotic prescription

Key point: As the day goes on, resistance to prescribe potentially inappropriate antibiotics seems to fade.

Citation: Linder JA, Doctor JN, Friedberg MW, et al. Time of day and the decision to prescribe antibiotics. *JAMA Intern Med*. 2014 Oct 6; doi: 10.1001/jamainternmed.2014.5225. [Epub ahead of print]

Previous research has shown that resistance to making the easier choice tends to fade as fatigue increases. Physicians make many difficult decisions during the day and the authors of this study hypothesized that resistance to prescribing antibiotics for potentially inappropriate patients would decrease as the day progressed. Whether the pressure was perceived or related to actual patient demand, a desire to do something or excessive concerns about complications, physicians potentially face these pressures every day and decision fatigue might increase the likelihood of inappropriate antibiotic prescription.

The authors of this study attempted to prove their theory by reviewing prescription writing for diagnoses that are considered inappropriate. This study was a retrospective review of billing and electronic medical record data compared with time of prescription in a 4-hour patient care session. Over 20,000 adult patients at 23 centers met inclusion criteria. Odds ratios increased from the first hour to 1.01 in the second hour, 1.14 in the third hour, and 1.26 in the final hour. Diagnoses for which antibiotics are never indicated included bronchitis, nonspecific respiratory tract infection, influenza and non-streptococcal pharyngitis. Diagnoses for which antibiotics are sometimes appropriate included otitis media, sinusitis, pneumonia, and strep. Making assumptions about the appropriateness of antibiotics based solely on diagnosis codes and prescribing data is far from a perfect method. If patient records were reviewed the number of inappropriate prescriptions may be less than what was used in the study. However, the authors' theory remains interesting. Unfortunately they do not provide a method for reducing the effect of decision fatigue.

Acute care providers should at least keep the premise of this study in mind when deciding to prescribe antibiotics as the day wears on. ■

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Clarithromycin and risk of cardiac death

Key point: Clarithromycin may increase risk of cardiac death although the risk is small.

Citation: Svanström H, Pasternak B, Hviid A. Use of clarithromycin and roxithromycin and risk of cardiac death: Cohort study. *BMJ*. 2014;349:g4930. doi: 10.1136/bmj.g4930.

Recent studies have pointed to increased cardiac death from erythromycin and azithromycin. The current theory is that

macrolides prolong the Q-T interval, leading to torsades de point and eventually death from arrhythmia. Danish investigators attempted to see if there was an increased risk of cardiac death from clarithromycin and roxithromycin (the two macrolides available in their country) compared with penicillin V.

In this prospective cohort study, use of antibiotics and cardiac causes of death in patients ages 40 to 74 were reviewed. More than 3 million patients qualified and 160,297 courses of clarithromycin and almost 4.4 million courses of Penicillin V were given. The cardiac death rates were 2.5/1000 patient years for penicillin compared with 5.3 for clarithromycin. The ratio was 1.79 for all clarithromycin patients, but 2.83 for women. Overall, the use of clarithromycin would account for 37 deaths per 1 million courses.

From an urgent care provider perspective, although the absolute number is very small, this information should be added to the risk:benefit balance when prescribing clarithromycin, particularly in women or patients who have any other reason for prolonged QT interval. ■

Isolated loss of consciousness and TBI

Key point: Isolated loss of consciousness is a poor predictor of clinically important traumatic brain injury (ciTBI)

Citation: Lee LK, Monroe D, Bachman MC, et al. Isolated loss of consciousness in children with minor blunt head trauma. *JAMA Pediatr*. 2014;168(9):837-843.

This article takes another look at the 2008 PECARN study data to assess the risk of ciTBI in patients with loss of consciousness. The original prospective multicenter cohort study enrolled more than 42,000 children. Of them, 15% were noted to have loss of consciousness (LOC). The prevalence of ciTBI was 2.5% with LOC and 0.5% without. Isolated LOC had a prevalence of 0.5% ciTBI.

From an urgent care perspective, this review of the data should reinforce the low risk of ciTBI in isolated LOC. It should also help reduce the number of CT scans of the head ordered in these children. For those of us without CT scanners, it should help to reduce the need to transfer patients as well. ■

New vs old treatments for VTE

Key point: New treatments for VTE may be as good as or even better than the old.

Citation: Castellucci LA, Cameron C, Le Gal G, et al. Clinical and safety outcomes associated with treatment of acute venous thromboembolism: A systematic review and meta-analysis. *JAMA*. 2014;312(11):1122-1135.

For many years, heparin and then vitamin K antagonist was the treatment of choice for venous thromboembolus. Recently seven other methods have been proposed and evaluated. These include low-molecular-weight heparin (LMWH), or fondaparinux in combination with vitamin K antagonists; LMWH with dabigatran or edoxaban; rivaroxaban; apixaban; and LMWH alone. In this systematic review and meta-analysis, the authors reviewed 1197 trials and selected 45 trials with almost 45,000 patients. Included studies where chosen based on rates of recurrent thromboembolus and inclusion of major bleeding.

The authors of this study concluded that there were no statistically significant differences for the efficacy and safety of the new methods compared to LMH and vitamin K antagonist. Of interest, unfractionated heparin (UFH) plus vitamin K therapy antagonist was the least effective therapy and rivaroxaban and apixaban appeared to be associated with the lowest risk of bleeding.

For the urgent care provider considering which method to use, the old way (UFH then vitamin K therapy antagonist) may not be the best way and consideration of this meta-analysis may help guide these decisions. ■

Antibiotics for pediatric pharyngitis

Key point: Gaps between recommended prescription practice and actual data may be large.

Citation: Dooling KL, Shapiro DJ, Van Beneden C, et al. Overprescribing and inappropriate antibiotic selection for children with pharyngitis in the United States, 1997–2010. *JAMA Pediatr*. 2014 Sep 29 doi: 10.1001/jamapediatrics.2014.1582. [Epub ahead of print]

In this pediatric pharyngitis-focused study, the authors attempted to look at both the amount and type of antibiotics used to treat pharyngitis National data were extrapolated from two surveys (National Ambulatory Medical Care Survey and the National Hospital Ambulatory Medical Care Survey) for pediatric patients with pharyngitis and their treatment. Almost 12 million visits per year were noted with prescription of antibiotics to 60% of the patients. Other studies have shown a strep rate closer to 37%. Of those prescriptions, almost 40% were drug other than narrow-spectrum antibiotics such as penicillin and amoxicillin, which have been determined to be almost universally effective.

Although the authors attempted to eliminate other reasons for use or alternative type of antibiotics, even allergy status was not part of this analysis. This study may be a good reminder that narrow-spectrum antibiotics are best for strep throat, however, the final data are questionable because their methods of deciding what was inappropriate were not based on chart data but billing data. This study may be a better example of trend than of degree of antibiotic overuse and potentially inappropriate choice. ■

Antibiotics and childhood obesity

Key point: Rethink the antibiotic and reduce the spectrum to potentially decrease childhood obesity.

Citation: Bailey LC, Forrest CB, Zhang P, et al. Association of antibiotics in infancy with early childhood obesity. *JAMA Pediatr*. 2014;168(11):1063-1069.

Childhood obesity has been in the news recently. This study, which looked at antibiotic use before age 2 and obesity from ages 2 to 5, presents a potential cause as well as a modifiable risk factor. The cohort study was conducted using electronic medical records from 2001 to 2013. A total of 64,580 children were included. Sixty-nine percent of the children were exposed to antibiotics before age 2. Antibiotics such as penicillin and amoxicillin, which are recommended in guidelines for first-line treatment, were labeled as narrow-spectrum antibiotics. All others were considered broad spectrum. Both exposed and unexposed children had the same pre-antibiotic weight to height Z scores.

Increased obesity in children was associated with treatment with broad-spectrum antibiotics but not with treatment with narrow-spectrum antibiotics—relative risk 1.16. The effect was greater with more exposures, particularly in children with more than 4 exposures. The proposed mechanism is changes in the gut flora during an important developmental period. This study is far from proving cause but it does provide at least a reason for thought. From an acute care perspective, it offers another reason to avoid broad-spectrum antibiotics, if possible. It also might be helpful in convincing parents about the dangers of antibiotics. ■

TMP/SMX in the elderly

Key point: Reconsider trimethaprim/sulfamethoxazole in elderly patients taking ACE inhibitors and blockers.

Citation: Fralick M, Macdonald EM, Gomes T, et al. Co-trimoxazole and sudden death in patients receiving inhibitors of renin-angiotensin system: population based study. *BMJ*. 2014;349:g6196 doi: 10.1136/bmj.g6196 (Published 30 October 2014)

This large study reviewed sudden deaths in patients aged 66 years or older treated with an angiotensin-converting enzyme inhibitor or angiotensin receptor blocker and antibiotics. The antibiotics included co-trimoxazole, amoxicillin, ciprofloxacin, norfloxacin, and nitrofurantoin. Almost 40,000 patients were identified and 1,027 deaths occurred. Elevated potassium levels were felt to be the causative agent in these deaths. Limitations of this study included data not being directly from patient charts. Blood values and the diseases treated also may have affected the results. The authors found a significant increased risk of death in patients treated with co-trimoxazole compared to amoxicillin—odds ratio 1.83. Ciprofloxacin also was associated with a small increase in risk of sudden death.

From an acute care perspective, these results should give providers pause in prescribing cotrimoxazole and perhaps even ciprofloxacin to the aforementioned patients. ■

AAP guidelines for treatment of bronchiolitis

Key point: AAP guidelines on the treatment of bronchiolitis offer few surprises.

Citation: http://pediatrics.aappublications.org/content/early/2014/10/21/peds.2014-2742

Bronchiolitis continues to be an illness frequently seen in urgent care centers. The American Academy of Pediatrics has issued new guidelines for the treatment of bronchiolitis in children younger than age 2 years. As expected, the guideline is well done and the recommendations are graded by level of evidence. As with other guidelines, I will review some of the recommendations most applicable to urgent care. Recommendation 1c: When clinicians diagnose bronchiolitis on the basis of history and physical examination, radiographic or laboratory studies should not be obtained routinely (Evidence Quality: B; Recommendation Strength: Moderate Recommendation). Recomendation 2: Clinicians should not administer albuterol (or salbutamol) to infants and children with a diagnosis of bronchiolitis (Evidence Quality: B; Recommendation Strength: Strong Recommendation). Recommendation 5: Clinicians should not administer systemic corticosteroids to infants with a diagnosis of bronchiolitis in any setting (Evidence Quality: A; Recommendation Strength: Strong Recommendation). Recommendation 8: Clinicians should not administer antibacterial medications to infants and children with a diagnosis of bronchiolitis unless there is a concomitant bacterial infection, or a strong suspicion of one (Evidence Quality: B; Recommendation strength: Strong Recommendation). From an acute care perspective, these guidelines will likely confirm current practice. ■

Fluid intake and recurrent nephrolithiasis

Key point: Consider recommending to patients at risk of recurrent nephrolithiasis intake of more fluids to produce 2 L of urine per day.

Citation: Qaseem A, Dallas P, Forciea MA, Starkey M, Denberg TD, for the Clinical Guidelines Committee of the American College of Physicians. Dietary and Pharmacologic Management to Prevent Recurrent Nephrolithiasis in Adults: A Clinical Practice Guideline From the American College of Physicians. *Ann Intern Med*. 2014;161:659-667.

This article, which was written by the American College of Physicians (ACP), is intended as a guideline to help prevent recurrent nephrolithiasis and was created through a synthesis of the medical literature. Grading was done by ACP's clinical practice guideline grading system, including strength of recommen-

"The American Academy of Pediatrics has issued new guidelines for the treatment of bronchiolitis in children younger than age 2 years."

dation and quality of evidence. Dietary and pharmacological interventions were both reviewed. The literature analysis resulted in two recommendations. The first was to increase fluid intake throughout the day to produce 2 L of urine daily (weak recommendation, low quality evidence). The second recommendation was to add treatment with a thiazide diuretic, citrate, or allopurinol if increased fluid intake failed (weak recommendation, moderate quality evidence).

For acute care providers, it makes sense to consider recommending increased fluid intake in patients who are unlikely to be harmed by this intervention. Consideration the risks associated with the medications, prescription of them may be better left to specialists. ■

Treatment options for gonorrhea

Key point: Options may exist if ceftriaxone is not the best choice for treatment of gonorrhea.

Citation: Kirkcaldy RD, Weinstock HS, Moore PC, et al. The efficacy and safety of gentamicin plus azithromycin and gemifloxacin plus azithromycin as treatment of uncomplicated gonorrhea. *Clin Infect Dis*. 2014;59(8):1083-1091.

As the authors state, intramuscular ceftriaxone injection is the foundation of treatment for gonorrhea. Other options may soon become necessary because of increasing resistance or in patients who are allergic to ceftriaxone. The authors designed a randomized, multisite, open-label, noninferiority trial in five outpatient sexually transmitted disease clinics in the United States. Patients with uncomplicated urogenital gonorrhea were randomly assigned to either gentamicin 240 mg intramuscularly plus azithromycin 2 g orally, or gemifloxacin 320 mg orally plus azithromycin 2 g orally. Of 202 patients treated with gentamicin and azithromycin who were able to be evaluated, 100% were cured. The primary outcome was microbiological cure defined by a negative repeat culture. For 199 patients treated with gemifloxacin and azithromycin, the cure rate was 99.5%. Both groups had significant side effects.

From an urgent care perspective, this is a small study but might provide some direction if the traditional treatment with ceftriaxone is ineffective or contraindicated. ■

High Alvardo score and need for CT scan

Key point: High Alvarado score may reduce the need for CT scan

Citation: Tan WJ, Acharyya S, Goh YC et al . Prospective comparison of the Alvarado Score and CT scan in the evaluation of suspected appendicitis: A proposed algorithm to guide CT use. *J Am Coll Surg*. 2014 Oct 25; [e-pub ahead of print].

The balance between unnecessary surgery and missing appendicitis has been made easier by the computed tomography (CT) scan. However, radiation exposure concerns have called into question the number of scans performed. The authors of this prospective trial once again looked to see if the Alvarado appendicitis score had utility in determining the need for CT. A total of 350 consecutive patients scanned for appendicitis were assigned an Alvarado score and final pathology was used. The authors concluded that an Alvarado score of 7 and above in males and 9 and above in females should be used to decide whether to go straight to surgery rather than CT scan. The authors did note that their score cut off development was prospective but the trial itself was done to create the rule rather than to evaluate it. Therefore these values need prospective review before they can be validated.

From an acute care perspective, the Alvarado score is less helpful because the consulting surgeon may not accept these data. A number below which a CT scan should not be obtained might be more helpful. ■

Influenza in vaccinated patients

Key point: It could still be influenza if the patient was immunized.

Citation: Aquino TL, Brice GT, Hayes S, et al. Influenza outbreak in a vaccinated population — USS Ardent, February 2014. *MMWR Morb Mortal Wkly Rep*. 2014 Oct 24;63(42):947-949.

In February 2014, an outbreak of influenza among young adults with prior influenza vaccine was noted on a naval vessel. Over a 3-day period, 25 of 102 crew members sought care for flu-like symptoms. Of those patients, 20 were found to have Influenza A and 18 of those cases were H3N2. The influenza vaccine was though appropriate for the strain identified. The outbreak was on the USS Ardent, an Avenger-class minesweeper, one of the smallest ships in the U.S. Navy, and it was tracked to a patient who roomed with a member of the crew who likely had influenza 11 days earlier.. Although influenza vaccination continues to be the best way to prevent the illness, it still can occur in a significant percentage of young, healthy adults.

For acute care providers, this article reminds us to consider influenza even in vaccinated populations. ■