ABSTRACTS IN URGENT CARE

- When Handlebar Meets Abdomen
- Corticosteroids and Asthma
- Antibiotics in Pediatric PAC
- Surfactant Use in AOM
- COVID Pneumonia and Disease Progression
- Neutralizing Antibodies in COVID

IVAN KOAY MBCHB, FRNZCUC, MD

Pediatric Abdominal Injuries from Handlebars

Take-home point: Handlebar impact is a high-risk mechanism for serious intraabdominal injury in children and necessity of operative intervention is common.

Citation: Vanderwalle R, Barker S, Raymond J, et. al. Pediatric handlebar injuries: more than meets the abdomen. *Pediatr Emerg Care*. 2021;37(9):e517-e523.

Relevance: It is important to appreciate the significance of bicycle handlebar injuries as a unique mechanism when involving the abdomen to avoid missing potentially catastrophic injury.

Study summary: This was a retrospective trauma registry review of children presenting to a U.S. pediatric ED after bicycle accidents. The children were divided into two groups: those with and without handlebar injuries. The presence of handlebar injuries was extrapolated from review of the medical record, either from history or physical exam findings. Patients' injuries were further classified into seven anatomical regions and the need for intervention. The regions were abdominal solid organ/nonhollow viscus, abdominal hollow viscus, thoracic (nonskin), head/spine/central nervous system (CNS), face/neck/non-CNS, extremity bone/neurovascular, and thoracoabdominal/extremity soft tissue.

The authors found 385 patients meeting inclusion criteria, with 107 sustaining handlebar injuries and 278 non-handlebar injuries. Injury zone breakdown for handlebar injuries included solid organ (39%), soft tissue (26%), face/neck/non-CNS (12%), hollow organ (11%), thoracic (5%), extremity (5%), and head/spine/CNS (2%). Among all patients, 38.7% required operative intervention while 13.2% required a nonoperative procedure. Patients with handlebar injuries had slightly lower injury severity scales and lower head abbreviated injury scale, but longer lengths of stay. Extremity injuries were also more frequent in the non-handlebar group. The need for operative intervention across groups was no different.

Editor's comments: This study was limited by retrospective methodology and the fact that less severe handlebar injuries may not have been captured in documentation. Regardless, it is clear that such injuries involving translation of the force of a bicycle handlebar are among the highest-risk trauma mechanisms for significant injury. ■

Ivan Koay, MBChB, FRNZCUC, MD is an urgent care physician; RNZCUC Examiner; Education Faculty for the RCSI Fellowship of Urgent Care Medicine; and Head of Faculty na hÉireann RNZCUC.

Prescribing Stewardship of Oral Corticosteroids for Asthma

Take-home point: Frequent use of oral corticosteroids (OCS) bursts and ongoing maintenance therapy in the treatment of asthma for adults and adolescents are associated with a multitude of acute and chronic adverse effects.

Citation: Blakely J, Chung L, McDonald V, et. al. Oral corticosteroids stewardship for asthma in adults and adolescents: a position paper from the Thoracic Society of Australia and New Zealand. *Respirology*. 2021;26(12):1112-1130.

Relevance: The use of OCS is common in the treatment of acute exacerbations of asthma. While often effective at ameliorating asthma symptoms, the potential for adverse effects is commonly underrecognized.

Study summary: This was a position statement issued by the Thoracic Society of Australia and New Zealand reviewing the current knowledge pertaining to OCS use in asthma and aimed at delineating principles of OCS stewardship. The authors performed a literature review and issued consensus recommendations.

The authors describe that regular use of inhaled corticosteroids (ICS) reduces the risk of mortality from asthma and severe exacerbations by half in appropriate patients. ICS has been shown to be as effective as low-dose oral prednisolone for maintenance treatment in most patients with asthma.

The use of OCS reduced hospitalization and relapse rates at 7-10 days. A short (5-day) course of nontapered OCS is the preferred treatment for a true acute asthma exacerbation. However, the authors found that OCS use was excessive in relation to asthma severity and that OCS were commonly dispensed to patients with asthma due to suboptimal adherence with ICS treatment. They found that patients taking at least 10 mg per day of prednisolone-equivalent were at higher risk of developing musculoskeletal, metabolic, and psychiatric issues. Patients who had been dispensed >1,000 mg prednisolone-equivalent dose in a lifetime were significantly more likely to suffer from adverse outcomes.

Editor's comments: This was a position statement representing an arguable opinion on OCS overprescribing based on the Thoracic Society of Australia and New Zealand's focus groups review of relevant literature. Studies quoted were reliant on variable methodologies to collate data. ■

Oral Antibiotic Dose and Duration in Pediatric Community-Acquired Pneumonia (CAP)

Take-home point: Lower dosage and 3-day duration of amoxicillin was noninferior to higher dosage and 7-day duration treatment.

Citation: Beilicki J, Stöhr W, Barratt S, et. al. Effect of amoxicillin dose and treatment duration on the need for antibiotic re-treatment in children with community-acquired pneumonia: The CAP-IT Randomized Clinical Trial. *JAMA*. 20212;326(17):1713-1724.

Relevance: Antibiotic stewardship involves more than just deciding when to treat with antibiotics. Prescribing the shortest course and lowest dose possible to achieve therapeutic effect also can reduce risk of adverse events.

Study summary: This was a multicenter, double-blind, placebo-controlled, randomized trial with a 2 × 2 factorial, noninferiority design, conducted in 29 hospitals in the UK and Ireland, comparing total daily amoxicillin doses (35-50 mg/kg vs 70-90 mg/kg) and duration of therapy (3 vs 7 days) for treatment of CAP in children. Participants were randomized in a 1:1 ratio by dispensing the next sequentially numbered set of trial drug bottles. Nasopharyngeal swabbing for *Streptococcus pneumoniae* carriage and resistance was obtained at enrollment. The primary outcome measured was the need for repeat antibiotic retreatment within 28 days of enrollment.

The authors enrolled 814 children. In lower vs higher doses, retreatment rates were 12.6% (lower) and 12.4% (higher) and in the 3- vs 7-day regimen, retreatment rates were 12.5% (shorter) and 12.5% (higher)—both meeting criteria for noninferiority.

Post-hoc analysis of children who took 80% of the medication showed noninferiority for both lower doses and shorter duration course. Resolution of clinical disease was not significantly different between groups by doses or durations of treatment. Forty-two percent of the swabs taken were colonized for *S pneumoniae* with penicillin nonsusceptibility identified in 16.9% of samples.

Editor's comments: In this study, it was not possible at enrollment to equivocally identify children who would benefit from antibiotic treatment and it was left to clinician discretion. As most cases of pediatric pneumonia are known to be viral in etiology, it is likely that much of the noninferiority was driven by lack of antibiotic utility for viral infections. ■

Intranasal Surfactant in the Treatment of Acute Otitis Media (AOM)

Take-home point: Artificial surfactant containing dipalmitoyl phosphatidylcholine and cholesteryl palmitate did not improve outcomes in children treated for AOM.

Citation: Muniz G, Shope T, Bhatnagar S, et al. Intranasal surfactant for acute otitis media: a randomized trial. *Pediatrics*. 2021;148(6):e2021051703.

Relevance: AOM is among the most common pediatric UC presentations. While antibiotics are indicated in many cases, relief of symptoms from even appropriate antibiotic use takes time. This study sought to determine if adjunctive intranasal surfactant can be useful in this task.

Study summary: This was a phase 2a, single center, double-blind, randomized, placebo-controlled, parallel group study to assess the safety, tolerability, and efficacy of 20 mg/day of intranasal OP0201, a surfactant-like substance containing dipalmitoyl phosphatidylcholine and cholesteryl palmitate, as adjunct to oral antibiotic treatment for children with AOM. One hundred three children were randomized to receiving intranasal OP0201 or placebo together with amoxicillin-clavulanate 90/6.4 mg/kg per day in two divided doses for 10 days.

The authors found no clinically meaningful differences between treatment groups. The proportion of children with middle-ear effusion was slightly lower among children receiving OP0201; however, this did not meet statistical significance.

Editor's comments: The study was underpowered for the outcomes of interest because of early termination due to funding is-

sues. All patients were treated with antibiotics and therefore the utility of intranasal surfactant for serous otitis media or other causes of otalgia cannot be determined from this study. ■

COVID-19 Abstracts

Diagnosing COVID-19 Pneumonia and Disease Progression

Take-home point: Basic vital signs such as heart rate, blood pressure, temperature, respiratory rate, and oxygen saturations have high value in identifying patients with COVID-19 who are experiencing clinical deterioration.

Citation: Goyal D, Inada-Kim M, Mansab F, et al. Improving the early identification of COVID-19 pneumonia: a narrative review. *BMJ Open Respiratory Research*. 2021;8: e000911.

Relevance: Early identification of COVID-19 pneumonia allows for improved resource utilization while also minimizing associated morbidity and mortality. The use of vitals as inexpensive, quick, and noninvasive clinical data points is explored in this paper.

Study summary: This was a narrative review of the relevant literature involving the use of vital signs to identify deteriorating COVID-19 patients in the community. The authors performed a literature search for studies describing vital sign changes in patients with COVID-19 with more severe illness.

The authors noted that symptoms associated with disease progression were dyspnea, confusion, fatigue, dry cough, fever, chest tightness, abdominal pain, diarrhea, and vomiting. Unsurprisingly, elevated heart rate, persistent fever >38°C, respiratory rates of >26/min and oxygen saturations <95% on air were all found to be predictive of disease progression/need for intervention. These indicators were present in patients requiring ICU admission and were associated with higher mortality rates than patients with normal vital signs.

Perhaps most clinically relevant was that identification of patients with hypoxemia was useful in ensuring they were treated early with steroids, which was shown to have benefits for patients with moderate-to-severe disease. Interestingly, C-reactive protein (CRP) was found to be an unreliable biomarker for disease progression. However, CRP levels >150 mg/L were indicative of serious illness with requirements for early invasive ventilation.

Editor's comments: This narrative review affirms the value of home monitoring of vitals to guide patients with COVID-19 on when to seek additional care. Relying on objective data rather than symptoms to prompt reassessment could prove to be a useful strategy in preventing misuse of healthcare resources and to encourage infectious patients to remain in isolation. ■

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Early Treatment of COVID-19 with Neutralizing Antibodies

Take-home point: In moderate- to high-risk patients, sotrovimab, a neutralizing antibody therapy, reduced the risk of disease progression.

Citation: Gupta A, Gonzalez-Rojas Y, Juarez E, et. al. Early treatment for COVID-19 with SARS-CoV-2 neutralizing antibody sotrovimab. *N Engl J Med*. 202118;385(21):1941-1950.

Relevance: This paper evaluates the efficacy of sotrovimab, a neutralizing monoclonal antibody used in the treatment of COVID-19, on the risk of disease progression.

Study summary: This was a phase III, multicenter, randomized, double-blind, placebo-controlled trial, evaluating a single intravenous infusion of sotrovimab (500 mg) for patients with mild-to-moderate COVID-19 but at high risk for progression to serious disease. Patients enrolled had a positive PCR COVID-19 test in the preceding 5 days and were assigned in a 1:1 ratio to sotrovimab or placebo infusion.

Five hundred eighty-three patients were randomized to receive sotrovimab (291 patients) or placebo (292 patients). The authors found three of the 291 sotrovimab patients (1%) compared with 21 of 292 placebo patients (7%) had disease clinically significant disease progression, classified as admission to hospital for >24 hours or any cause or death, which was statistically significant. Secondary analysis revealed no difference in adverse events between the sotrovimab and placebo groups (17% vs 19%). No serious adverse events occurred in either group. There was an 85% relative risk reduction (RRR) for hospitalization or death between patients who received sotrovimab vs those who received placebo.

Editor's comments: This study was sponsored by the pharmaceutical company manufacturing sotrovimab with a small numbers of participants, limiting ability to detect rare adverse events. Baseline antibodies to COVID-19 were not examined in this study and may have accounted for differences between groups. Hospitalization and death were used a composite endpoint, but certainly prevention of mortality is clinically and practically different than avoiding hospitalization. It is unclear how well sotrovimab antibodies may neutralize subsequent variants of SARS-CoV-2. ■