Antimicrobial Prescribing Practices for Enteric Bacterial Infections in an Integrated Rural Healthcare System, 2004–2017
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Background. Bacterial enteric infections are common in the United States, but few studies have evaluated antibiotic prescribing practices for these illnesses. Unnecessary antibiotics can lead to adverse events and emergence of antimicrobial resistance. We assessed treatment practices among patients with laboratory-confirmed enteric infections in a large regional healthcare system.

Methods. We used electronic health records to identify patients with laboratory-confirmed non-typhoidal Salmonella, Shigella, Shiga toxin-producing E. coli (STEC), and Campylobacter infections from 2004 to 2017. We extracted relevant clinical data, including diagnosis codes for chronic conditions and receipt of immunosuppressive medications in the 60 days before and after the encounter, and antibiotic prescriptions in the 14 days after the encounter. We defined an appropriate treatment based on pathogen, patient characteristics, and IDSA practice guidelines for the study period.

Results. We identified 2,064 patients infected with enteric pathogens: 1,251 (61%) with Campylobacter, 564 (27%) Salmonella, 199 (10%) STEC, and 50 (2%) Shigella. Overall, 425 (20%) patients were immunocompromised, ranging from 17% for Salmonella to 46% for STEC. There were 220 (11%) hospitalizations. The frequency of antibiotic prescribing was highest for Campylobacter (60%), followed by Shigella (50%) and Salmonella (49%). Prescriptions were appropriate for 62% of Campylobacter cases, 92% of Shigella, and 70% of Salmonella. Antibiotics were prescribed for 39% of STEC infections although they are generally not indicated. Appropriate treatment was highest for children with Campylobacter (87%) and lowest for adults ≥50 years with Campylobacter (42%). Among those with Salmonella, appropriate treatment was higher in those with a comorbidity (79% vs. 68% without, P < 0.05). Rates of appropriate use did not improve over time.

Conclusion. Antibiotic prescribing for laboratory-confirmed enteric infections was frequently inappropriate and inconsistent with practice guidelines. Antibiotic stewardship initiatives should address acute bacterial gastrointestinal infections in addition to other common infections.

Disclosures. All Authors: No reported Disclosures.

Vaccines for Influenza A Virus to Inform Live Attenuated Vaccine (LAV) Development
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Background. Respiratory syncytial virus (RSV) infection is a leading cause of hospitalization for infants. Several vaccine strategies for RSV are being developed. Among those, live attenuated vaccines (LAV) represent an attractive alternative for young children due to their innate immune response and potential for enhancing disease. However, markers of reactogenicity and/or innate immune protection in the respiratory mucosa are not well defined. The objective of this study was to assess mucosal markers, including innate immune cytokine profiles and RSV loads (VL), and their potential association with protection from severe disease in infants with natural RSV infection.

Methods. Single-center, prospective study in previously healthy infants with mild (outpatients; OP) and severe (inpatients; IP) RSV infection, and aged-matched healthy controls (HC). Nasopharyngeal (NP) swabs were obtained at enrollment in all subjects to measure VL by PCR, and cytokine concentrations (conc.) using a 13-plex panel that included: Type-I, type-II, and type-III IFN, and inflammatory cytokines. Cytokine conc. and VL were compared according to hospitalization status (OP vs. IP).

Results. From 2014 to 2017 we enrolled 105 infants: 48 with severe RSV infection (IP; median IQR age: 2.3 [1.1–5.5] months), 36 with mild disease (OP; 6.4 [3.8–9.3] months), and 20 HC (4.9 [2.8–7.2] months). The median duration of symptoms at enrollment was 4 days for both IP and OP. IL-10, TNF-α, and IL-10 were detected more frequently in RSV infants than in HC (39% vs. 5%, respectively), but median conc. in IP and OP were not different (P > 0.05). Detection and/or conc. of IFN-β, IP-10, IFN-γ, and type III IFN (IFN-αL, IFN-λ3) were significantly greater in OP vs. IP who also had higher VL (Table 1). In addition, IP-10 (r = 0.6, P < 0.001) and IFN-λ conc. (r = 0.55, P < 0.0001) significantly correlated with RSV VL.

Conclusion. Infants with mild RSV infection had higher VL and a more robust type-I, -II, and -III IFN responses than those hospitalized with severe disease. These findings suggest that increases in mucosal IFNs are associated with protection against severe RSV infection, and could potentially be used as surrogate markers to help the development of LAV for RSV infection in young children.