Type III hypersensitivity immune response during the chronic course of the illness. This immune response presents as systemic symptoms and neutrophil leukocytosis, simi-
lar to sepsis. Capsule Thalidomide is considered the drug of choice, when it comes to the treat-
ment of this acute immunological emergency. A rational study into the immunological markers involved in the pathogenesis of erythema nodosum lepro-
sum and its successful suppression by Thalidomide should be helpful in early diagnosis, and prompt successful therapy. On the basis of previous studies, our aim was to find a correlation with interferon-γ, tumour necrosis factor-α, and CD-64 expression on activated circulating neutrophils during Type II lepra reaction and successful response to capsule Thalidomide.

Methods. This case-controlled study included one group of patients diagnosed to have leprosy and the other group was healthy controlled individuals with matched age, sex, and area of residence. All the patients with type II lepra reaction responded to Capsule Thalidomide treatment and all the skin lesions resolved in 7–14 days. Blood samples and skin biopsy were subjected to histopathology, immunofluorescence assay, immunohistochemical staining, quantitative RT-PCR (reverse transcriptase-polymer-
ase chain reaction), and flow cytometry.

Results. Interferon-γ and TNF-α are sensitive markers in diagnosing erythema nodosum lepromatous and CD-64 expression on activated circulating neutrophils is both a specific and sensitive marker in Type II lepra reaction. CD-64 expression also had a positive correlation with Thalidomide treatment and clinical response. High polymorph-
phonuclear Cd-64 expression was correlated with severity of ENL.

Conclusion. CD-64 expression on circulating neutrophils is a potential early bio-
physical marker for diagnosing erythema nodosum lepromatous and can be used as a tool to assess thalidomide response. It is however not a good index to diagnose leprosy infection as it was specific for Type II lepra reaction. Interferon-γ and TNF-α are sen-
sitive markers to screen for lepra reactions and this study showed no significant corre-
lation with Thalidomide therapy.

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813. Combination of N-Acetyl-Cysteine With Clarithromycin Against Mycobacterium avium Infection Ayako Shiozawa, MD, Chikako Kajiwara, PhD; Yoshikazu Ishii, PhD and Kazuhiko Tateda, PhD, MD,1; 1Department of Microbiology and Infectious Diseases, Toho University School of Medicine, Tokyo, Japan

Session: 70. Tuberculosis and Other Mycobacterial Infections

Thursday, October 4, 2018: 12:30 PM

Background. N-Acetyl-cysteine (NAC) is widely used in patients with chronic pulmonary diseases. In previous studies, its antimicrobial and antibacterial effects have been reported. Among its effect in Mycobacteria, it has been mainly stud-
ied in Mycobacterium tuberculosis. Here, we examined whether NAC has antibiotic activity against M. avium.

Methods. The antimycobacterial effect of NAC was assessed in JCM 15430 M. avium strain infected A-549 (human lung epithelial cells) and MH-S (mouse alveo-
lar macrophages). These cells were infected with M. avium at multiplicity of infection of 10 for 1 hour, washed and then cultivated for 5 days. Bacterial uptake was evaluated at 0 days and 5 days of cultivation. For the NAC treatment group, 5% PBS medium with 10 mM NAC was used as culture medium. We also tested its effect in combination with clarithromycin. M. avium-infected A-549 cells were infected intracellularly with M. avium, and were given NAC (400 mg/kg) or clarithromycin (100 mg/kg) or both by gavage daily for 6 days. On day 7 of infection, lungs were harvested and CFU, cytokines and antimicrobial peptides were measured.

Results. NAC treatment of M. avium-infected A-549 and MH-S resulted in a sig-
nificant reduction of mycobacterial loads (P = 0.014 and P = 0.014). In vivo, NAC treat-
ment resulted in a significant reduction of mycobacterial loads in the lunes of M. avium-infected mice (P = 0.007). When in combination with clarithromycin, we also had an additional reduction (vs. clarithromycin monotherapy; P = 0.001). Several anti-
mycobacterial peptides significantly increased when treated with NAC and clarithrom-
ycin combination therapy.

Conclusion. NAC exhibits potent anti-mycobacterial effects and may limit M. avium infection. In addition with clarithromycin, it showed an additive effect in reduction of mycobacterial loads. Interestingly, in our study, several antimicrobial peptides increased significantly which may be one of the possibility on how NAC is involved in antimycobacterial effects. These results indicate that NAC may be an addi-
tional option in treating M. avium-infected patients in future, along with its classical dor-
regimens containing clarithromycin.

Disclosures. All authors: No reported disclosures.

984. Maternal and Infant Factors Influencing Influenza Vaccination Among Young Children Born in Colorado From 2008 to 2016 Mushegh Alishahi, MS1; Lauren De Crescenzo, BA2 and Sachitra Rao, MBBS1,2

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Session: 130. Adult and Pediatric Influenza Vaccine

Friday, October 5, 2018: 12:30 PM

Background. Factors influencing influenza vaccination in the first 2 years of life are important to identify and target strategies to increase vaccination rates, since this group is at high risk of morbidity from influenza. The objectives of our study were to determine maternal and neonatal factors associated with influenza vaccination in the first 2 years of life.

Methods. We conducted a retrospective cohort study using linked data from the Colorado Birth Registry Database and the Colorado Immunization Information System (2008–2016). Our population was limited to singleton, first births with first varicella vaccination documented in the immunization registry. Our primary outcome was receipt of at least one influenza vaccination in children 52 years. Exploratory variables included maternal (number of prenatal visits, urban vs. rural residence) and infant factors (term birth, admission to neonatal intensive care unit [NICU] at birth). Multivariable logistic regression was used to assess the association between these factors and influenza vaccination.

Results. Among 126,763 births in the cohort, 50.2% were vaccinated against influenza by 2 years of age. Mothers of unvaccinated children were older (27 vs. 26 years), married (67.8% vs. 66.8%), and more likely to have at least some college education (25.4% vs. 24.1%). A higher proportion of infants admitted to the NICU or who received oxygen were unvaccinated compared with vaccinated (8.5% vs. 8.0% and 2.5 vs 2.1, respectively), P = 0.006 for all. There were no differences between urban vs. rural residence. In adjusted/statistical analyses, an increase in pre-natal visits was asso-
ciated with a decrease in early influenza vaccination (IR = 0.992, 95% CI 0.986–0.998, P = 0.0084 for Hispanic mothers and IR = 0.984, 95% CI 0.973–0.996, P = 0.0089 for non-Hispanics). Among 8 years of Age in Colorado

Session: 88. Safety of Guidelines Recommending LAIV for Routine Use in Children and Adolescents With Asthma

Friday, October 5, 2018: 12:30 PM

Background. Asthma is the most common chronic medical condition in chil-
dren. Prior observational studies of live attenuated influenza vaccine (LAIV) safety in asthmatic children have been limited due to confounding by indication, with LAIV restricted to patients with mild asthma. To minimize bias, we evaluated safety of LAIV in children with asthma using a natural experiment in which two medical groups, within a single health system, serving similar populations, differed in vaccination guidelines. Prior to 2010 both groups recommended inactivated influenza vaccine (IIV), starting in 2010, one group recommended LAIV for children with asthma.

Methods. Asthmatic children age 2–18 years with visits to two large medical groups in the upper Midwest from 2007 to 2015 were identified and classified by severity and control using validated algorithms. Primary outcomes were lower respiratory events (LREs) (fatal, BALR in patients with LAIV for children with asthma.

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Session: 130. Adult and Pediatric Influenza Vaccine
Friday, October 5, 2018: 12:30 PM

Background. A clinical endpoint of moderate-to-severe (M/S) influenza has been proposed in children, defined as fever >39°C, otitis media, lower respiratory tract infection, or serious extrapolunmonary manifestations. This definition has not been evaluated against clinically relevant outcomes like hospitalization, emergency room care, antimicrobial use, and child/patient absenteeism.

Methods. We conducted a prospective observational study of children aged 6 months–8 years with influenza at the Children’s Hospital Colorado Emergency Department (ED) and its affiliates during two influenza seasons (2016–2017 and 2017–2018). Children with influenza-like illness (ILI) were enrolled and tested for influenza by polymerase chain reaction (PCR). Parents of influenza cases and matched influenza-negative controls were contacted 2 weeks later for follow-up. The primary outcome was hospitalization for M/S influenza vs. mild influenza. Secondary outcomes included recurrent ED visits, antimicrobial use, child/patient absenteeism. Interim analysis of ED visits was conducted using SAS v9.4.

Results. Among the 1,480 enrolled children with ILI, 410 (28%) tested positive for influenza by PCR. The median age of influenza cases was 4.0 years (IQR 2.2–6.1), and 20% were considered high-risk for influenza complications. Of influenza cases, 284 (69%) met the definition for M/S influenza. Among M/S influenza subjects, 8.4% were hospitalized, compared with 1.6% with mild influenza (risk difference (RD) 6.9%; 95% CI: 3.0–10.8, P < 0.01). Subjects with M/S influenza were more likely to receive antibiotics (RD 12.0%, 95% CI: 5.4–20.6, P < 0.01) with a trend to higher antiviral use (RD 6.9%, 95% CI: 0.7–14.5, P = 0.09). There was no significant difference for recurrent ED visits nor child/patient absenteeism. After adjusting for comorbidities, age, and influenza strain, the relative risk (RR) of hospitalization or recurrent ED visits was higher among those with M/S influenza vs. mild influenza (RR 2.18, 95% CI: 1.02–4.6, P = 0.04).

Conclusion. Children with M/S influenza have a higher risk of hospitalization compared with mild disease. This proposed definition is a useful clinical endpoint to study the public health and clinical impact of influenza interventions in children.

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B. Zhang, Seqirus: Employee and Shareholder, Company stock and Salary. T. Vesikari, Seqirus: Consultant, Consulting fee.

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2. Disclosures. K. Ramsey, Seqirus: Investigator, Research support. Novartis: Investigator, Research support. E. Heijn, Seqirus: Employee and Shareholder, Global Employee Share Plan and stock. B. Leav, Seqirus: Employee and Shareholder, Salary. J. Obere, Seqirus: Employee and Shareholder, Global Employee Share Plan and Salary.

988. Effectiveness of Seasonal Influenza Vaccines Against Influenza A(H3N2) Illness Among Children Aged <18 Years, US Flu VE Network, 2010–2018
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Session: 130. Adult and Pediatric Influenza Vaccine
Friday, October 5, 2018: 12:30 PM

Background. Estimates from 2017–2018 influenza vaccine effectiveness (VE) against influenza A(H3N2)-related illness in the United States indicated better VE among young children compared with nonadjuvanted influenza among older children and adolescents. We examined VE against influenza A(H3N2) illness during five A(H3N2)-predominant seasons from 2010–2011 through 2016–2017 to investigate differences between VE among younger vs. older children.

Methods. We analyzed data from 11,736 outpatients aged <18 years with medically attended acute respiratory illnesses enrolled at US Flu VE Network study sites during five influenza A(H3N2)-predominant seasons. Respiratory specimens from all enrollees were tested for influenza viruses using reverse transcription PCR. Children with documented receipt of the recommended number of doses of current season inactivated influenza vaccine at least 14 days before illness onset were considered fully vaccinated; partially vaccinated children and those who received live attenuated influenza vaccine were excluded. Vaccine effectiveness was estimated as 100 × (1 – adjusted odds ratio (aOR) from multivariable logistic regression for visiting study site, age, sex, presence of high-risk medical conditions, and days from illness onset to enrollment comparing odds of vaccination among A(H3N2)-positive cases vs. influenza-negative controls.

Results. A total of 1,854 influenza A(H3N2) cases and 9,882 influenza-negative controls were included; 494 (28%) influenza A(H3N2) cases and 3,637 (41%) controls were fully vaccinated before illness onset. VE ranged from 26% (95% confidence interval [CI], 17% to 37%) to 60% (38%–75%) among children aged 6 months–4 years from 9% (–16% to 29%) to 66% (57%–82%) among 5–17 year olds (figure). During 2012–2013 and 2014–2015, A(H3N2) VE estimates were significantly higher among younger compared with older children (P < 0.05); in other seasons before 2017–2018, A(H3N2) VE estimates were similar among younger and older children.

Conclusion. Higher VE against A(H3N2) viruses in younger vs. older children in some seasons suggests immunologic differences in response to vaccine components. These findings provided moderate protection against A(H3N2)-related illness among children.

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989. Clinical Effectiveness of High-Dose Trivalent vs. Quadrivalent Influenza Vaccination Among Veterans Health Administration Patients
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Session: 130. Adult and Pediatric Influenza Vaccine
Friday, October 5, 2018: 12:30 PM

Background. Despite the widespread availability of several injectable inactivated influenza vaccines (IIV), including the trivalent standard-dose (IIV3-SD) and high-dose (IIV3-HD), and the US Advisory Committee on Immunization Practices does not currently recommend one over another. The objective of this study was to assess the relative vaccine effectiveness (rVE) of IIV3-HD and IIV3-SD.

Methods. rVE was estimated from a retrospective cohort study of Veterans aged 65 years and older who received an IIV during the 2014–2015 influenza season.