Characterization of Antibiotic use Within Pediatric Patients with Cystic Fibrosis.

Elizabeth Shober PharmD
Lehigh Valley Health Network, Elizabeth.Shober@lvhn.org

Kristin M. Held Wheatley PharmD, BCOP
Lehigh Valley Health Network, Kristin_M.Held@lvhn.org

Published In/Presented At

Shober, E. Held Wheatley, K. (2017, December 2). *Characterization of Antibiotic use Within Pediatric Patients with Cystic Fibrosis.* Poster Presented at: ASHP Midyear 2017 Clinical Meeting and Exhibition, Orlando, Florida.

Characterization of Antibiotic Use Within Pediatric Patients with Cystic Fibrosis

Elizabeth Shober, PharmD and Kristin Held Wheatley, PharmD, BCOP
Lehigh Valley Health Network, Allentown, PA

PURPOSE

The purpose of this study is to quantify antibiotic exposure for pediatric patients with cystic fibrosis (CF) within Lehigh Valley Health Network (LVHN) by characterizing the criteria for initiation and antibiotic regimens prescribed.

BACKGROUND

- Cystic fibrosis (CF) is the most common inherited life-threatening autosomal recessive genetic disease that affects almost all organ systems. The most commonly encountered clinical presentation of CF is lung dysfunction.
- Pulmonary exacerbations are episodes of acute worsening of lung function and respiratory symptoms that are common among patients with CF. Treatment with antibiotics is typically initiated to preserve lung function.
  - There is substantial variation related to when to initiate antibiotics, the site of treatment (inpatient versus outpatient), the antibiotic regimen prescribed, and duration of therapy.
- Antimicrobial stewardship, or optimizing the selection, dose and duration of antibiotic therapy, is important to attenuate or reverse antimicrobial resistance, prevent antimicrobial toxicities, and decrease the costs of inappropriate antimicrobial use and healthcare associated infections.
- Due to the lack of standardized recommendations for antibiotic management for pulmonary exacerbations in patients with CF, we aim to characterize the antibiotic regimens across the inpatient and outpatient settings to quantify antibiotic exposure in this patient population.

STUDY DESIGN

- Retrospective chart review of pediatric patients with CF within LVHN.
- **INCLUSION CRITERIA**
  - Patients younger than 25 years of age with a confirmed diagnosis of CF being followed by pediatric pulmonology at LVHN
  - Patient received antibiotic therapy (outpatient and/or inpatient) for a pulmonary exacerbation, as diagnosed by a pediatric pulmonologist, during the study period
- **EXCLUSION CRITERIA**
  - Primary diagnosis for treatment with antibiotics unrelated to a pulmonary exacerbation
  - Patients presenting with massive hemoptysis, as defined and documented by pediatric pulmonologist
- The primary objective of this study will be to calculate the median days of antibiotic therapy in patients with CF.
- Secondary objectives
  - Determine the rate of days of antibiotic therapy per patient during the study period
  - Characterize the criteria for initiation based on clinical signs and symptoms versus clinical decline as defined by change in FEV_1 % predicted
  - Calculate the duration of antibiotic courses of inpatient and outpatient therapy
    - Evaluate durations of therapy based on gender, genotype, weight status, history of exposure to various pathogens, FEV_1 < 75% predicted, presence of CF-related complications, receipt of chronic medication therapy, duration of symptoms prior to treatment initiation, and presence of symptoms
    - Calculate time between antibiotic courses

METHODS

- LVHN's pediatric pulmonary CF database will be used to identify patients with a documented CF exacerbation for which he/she received antibiotics from August 1, 2015 to July 31, 2017. Inpatient and outpatient electronic medical records will be reviewed.
- Data to be collected will include:
  - Patient age, gender, height, weight, race, CF genotype
  - Hospitalizations in the previous 12 months, respiratory microbiology within the previous 12 months, chronic medications prescribed, presence of CF-related complications
  - Per each pulmonary exacerbation, the following will be collected:
    - BMI/weight percentile for age compared to previous best, spirometry, characterization of symptoms, documentation of therapy goal
    - Antibiotic regimen: name of antibiotic, antibiotic class, route, start/discontinuation dates, initiation via office visit vs. phone call
    - Admission/discharge date, PICC line placement, duration of OPAT (outpatient antibiotic therapy) will be collected, if applicable:
- Total antibiotic days will be calculated per patient and the median will be reported for the group as a whole. A rate of antibiotic therapy will also be reported per patient to quantify individual antibiotic exposure. Statistical analysis will be conducted to determine if any statistically significant differences exist in antibiotic days for predefined patient groups.

References:

1. Elborn JS. Cystic fibrosis. *Lancet.* 2016;388:2519-2531.
2. Waters V, Ratjen F. Pulmonary exacerbations in children with cystic fibrosis. *Ann Am Thorac Soc.* 2015;12(S2):S200-S206.
3. West NE, Beckett VV, Jain R, et al. Standardized treatment of pulmonary exacerbations (STOP) study: physician treatment practices and outcomes for individuals with cystic fibrosis with pulmonary exacerbation. *J Cyst Fibros.* 2017;16(5):600-606.
4. Hersh AL, Fleming-Dutra, KE. Vaccines and outpatient antibiotic stewardship. *Pediatrics.* 2017;140(3):e20171695.

Disclosures:

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:
- Elizabeth Shober - nothing to disclose
- Kristin Held Wheatley - nothing to disclose

610-402-CARE LVHN.org

Lehigh Valley Children's Hospital
LEHIGH VALLEY HEALTH NETWORK