APSR RESPIRATORY UPDATES

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Inside this issue: Pneumonia

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Antibiotic treatment strategies for community-acquired pneumonia in adults

Postma DF et al.

N Engl J Med 2015; 372: 1312-23

http://www.nejm.org/doi/full/10.1056/NEJMoa1406330

Comment: In this article, authors compared the clinical outcome of beta-lactam strategy with those of beta-lactam plus macrolide strategy and fluoroquinolone strategy in adult patients with CAP who were admitted to general wards. The study was conducted as a cluster-randomized, crossover trial with strategies rotated in 4-month periods. Primary outcome was all-cause 90-day mortality and secondary outcomes were the time to starting oral antibiotics, length of hospital stay, and occurrence of in-hospital complications. A total of 2283 patients were included in the intention-to-treat analysis: 656 patients in beta-lactam monotherapy strategy, 739 in beta-lactam- strategy, and 888 in fluoroquinolone strategy. There were no significant differences in 90-day mortality among the 3 groups indicating non-inferiority of beta-lactam monotherapy strategy. Although more patients in fluoroquinolone strategy started with oral antibiotics during hospitalization, length of hospital stay and incidence of complications also did not differ between the groups. The authors suggested that patients with CAP admitted to non-ICU wards could be preferentially treated with empirical beta-lactam monotherapy.

Association between hospitalization with community-acquired laboratory-confirmed influenza pneumonia and prior receipt of influenza vaccination

Grijalva CG et al.

JAMA 2015; 314 : 1488-97

http://jama.jamanetwork.com/article.aspx?articleid=2450326

Comment: Observational studies have shown that influenza vaccination is associated with lower odds of hospitalization for laboratory-confirmed influenza acute respiratory infections. In this prospective observational multicenter study, the authors determined whether influenza vaccination was associated with reduced odds of hospitalizations for laboratory-confirmed influenza-associated pneumonia. Children and adults admitted with CAP were enrolled and all patients were tested for influenza infection. Among 2767 patients eligible for the study, 162 (5.9%) had laboratory-confirmed influenza. Rate of prior receipt of influenza vaccination was significantly lower in patients with laboratory-confirmed influenza than in influenza-negative patients (17% [28/162] vs. 29% [766/2605], adjusted OR 0.43 [95% CI, 0.28-0.68]).

Despite the limitations from observational study design, this study suggests the close association between the influenza vaccination and reduced odds of hospitalizations for influenza-associated pneumonia.

Community-acquired pneumonia requiring hospitalization among U.S. adults

Jain S et al.

N Engl J Med 2015;373:415-27

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4728150/

Comment: Pneumococcal conjugate vaccine has significantly reduced the incidence of invasive pneumococcal diseases and pneumonia among adults. The Etiology and Pneumonia in the Community (EPIC) study by the CDC, a prospective, multicenter, population-based, active surveillance study, provided the contemporary population-based epidemiologic data for U.S. adults with pneumonia. The annual incidence of pneumonia was 24.8 cases per 10,000 adults, with the highest rates among adults 80 years of age or older (164.3 cases per 10,000 adults). Pathogens were detected in 38% of the patients: viruses in 27% and bacteria in 14%. The most common pathogens were human rhinovirus (9%), influenza virus (6%), and *S. pneumoniae* (5%). It is noteworthy that no pathogen was detected in the majority of patients despite current diagnostic tests. The authors explained that respiratory viruses were more frequently detected than bacteria probably due to the benefit of bacterial vaccines and relatively insensitive diagnostic tests. Rapidly changing technologies in diagnostic tests might further affect the understanding of the etiologies of community-acquired pneumonia in near future.

Viral etiology of community-acquired pneumonia among adolescents and adults with mild or moderate severity and its relation to age and severity

Qu J-X et al.

BMC Infectious Diseases 2015; 15: 89

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4342096/

Comment: This is a multi-center, prospective surveillance study conducted in Beijing to better characterize the viral etiology of CAP in adolescents and adults. They performed a multiplex RT-PCR assay covering all common respiratory viruses (RV) associated with CAP. Overall, pathogens (bacterial or viral) were found in 41.2%. The positive rate of RVs was 27.5%: influenza virus A (IFV A, 9.9%), rhinovirus (4.3%), adenovirus (4.2%). Frequency of IFV A was highest among patients aged between 45-64 years, while adenovirus among patients aged 14-17 years. The proportion of pandemic H1N1 increased with severity of pneumonia evaluated by PSI. The study concluded that the proportion of RVs in CAP is higher than previously reported. IFV A pneumonia are usually found in old adults, while adenovirus pneumonia are common in adolescents and young adults. The severity of pandemic H1N1-associated pneumonia is still higher. Although this study has limitations of underestimating bacterial pathogens, it gives further understanding of viral pneumonia in adolescents and adults.

Comparative treatment failure rates of respiratory fluoroquinolones or β-lactam + macrolide versus β-lactam alone in the treatment for community-acquired pneumonia in adult outpatients: an analysis of a nationally representative claims database

Lee MT et al.

Medicine 2015; 94: e1662

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4616833/

Comment: Although the current treatment guideline of infectious disease society of America (IDSA) for community-acquired pneumonia (CAP) recommends using respiratory fluoroquinolones or beta-lactams plus advanced macrolides as the empirical antibiotic regimen, little is known about the comparative effectiveness of these regimens. This retrospective cohort using the health insurance claims data of Taiwan suggested that moxifloxacin was associated with lower treatment failure rates compared with β-lactam alone, or levofloxacin. However, due to inherent limitations of the health insurance claims database, this study could not adjust severity of CAP relevantly. Moreover, the definition of treatment failure in this study included hospitalization and an emergency department visit due to CAP, which represent severity rather than outcome of pneumonia. Despite these limitations, this study suggested that the clinical effect of current empirical antibiotic regimens for CAP need to be validated by well-designed comparative studies.

Corticosteroid therapy for patients hospitalized with community-acquired pneumonia: a systematic review and meta-analysis

Siemieniuk RA et al.

Ann Intern Med. 2015;163:519-528

http://annals.org/article.aspx?articleid=2424872

Comment: Previous studies about benefit of systemic corticosteroid use in community-acquired pneumonia (CAP) failed to establish a conclusive benefit. This systematic review evaluating only randomized controlled trials (RCTs) showed benefits of systemic corticosteroids in CAP - a decrease in hospital stay of approximately 1 day and an absolute reduction in risk for mechanical ventilation of 5%. Moreover, apparent mortality benefit was observed in trials of severe pneumonia (RR 0.39; CI 0.20 - 0.77; I^2 = 0.2%). These results can be a strong evidence for using systemic corticosteroid in CAP. However, it should be noted that numbers of patients included in trials of severe pneumonia were relatively small (14 to 61 per each arm) compared to those of less severe pneumonia (23 to 392 per each arm). A well designed large sized RCT for severe CAP is needed to conclude the result of this systematic review.

Effectiveness of 23-valent pneumococcal polysaccharide vaccine against invasive disease and hospital-treated pneumonia among people aged ≥65 years: a retrospective case-control study

Leventer-Roberts M et al.

Clin Infect Dis 2015; 60:1472-80

http://cid.oxfordjournals.org/content/60/10/1472.long

Comment: Effectiveness of the 23-valent pneumococcal polysaccharide vaccine (PPSV23) has largely been demonstrated for invasive pneumococcal diseases, however its effectiveness for preventing pneumonia has not been clearly determined. This retrospective case-control study nested in a population-based cohort demonstrated that PPSV23 vaccine was effective against the most severe invasive forms of pneumococcal disease, but it had no detectable effectiveness in preventing all cause hospital treated pneumonia. The authors addresses that there is a need for a vaccine that effectively protects against pneumonia.

Polysaccharide conjugate vaccine against pneumococcal pneumonia in adults

Bonten MJM et al.

N Engl J Med 2015;372:1114-25

http://www.nejm.org/doi/full/10.1056/NEJMoa1408544

Comment: This randomized, double-blind, placebo-controlled trial evaluated the efficacy of 13-valent polysaccharide conjugate vaccine (PCV13) in preventing first episodes of vaccine-type strains of pneumococcal pneumonia in adults 65 years of age or older in the Netherlands. It is called as the Community-Acquired Pneumonia Immunization Trial in Adults (CAPITA). A serotype-specific urinary antigen detection assay was used to assess the efficacy. They demonstrated a reduction in the relative risk of vaccine-type pneumococcal pneumonia of 45.6% and the relative risk of invasive pneumococcal disease of 75.0%. The ACIP's recommendation of the routine use of PCV13 for all adults 65 years of age or older in the U.S.A. was based largely on the results of CAPITA. It is noteworthy that the CAPITA also showed that PCV13 was not efficacious against noninvasive pneumococcal pneumonia regardless of serotype and against all-cause pneumonia.

Association of guideline-based antimicrobial therapy and outcomes in healthcare -associated pneumonia

Rothberg MB et al.

J Antimicrob Chemother 2015; 70: 1573–1579

http://jac.oxfordjournals.org/content/70/5/1573.long

Comment: Increasing prevalence of multidrug resistance (MDR) in major bacterial pathogens in Asian countries has resulted in the recommendations for initial empiric antibiotic therapy for hospital-acquired pneumonia (HAP) prepared by the international guidelines becoming inadequate. In this large observational study at 346 US hospitals, the association between guideline-based therapy (GBT) and outcomes for patients with healthcare-associated pneumonia (HCAP) was examined. Of 85097 patients, 31949 (37.5%) received GBT. They found that patients receiving initial therapy based on HCAP guidelines had higher unadjusted mortality than those receiving other antimicrobial combinations. After adjustment for patient factors, the difference between GBT and non-GBT was diminished. The authors concluded that better criteria are needed to identify patients at risk for MDR infections who might benefit from broad-spectrum antimicrobial coverage. As antimicrobial resistance differs by country, the treatment guidelines for HCAP or HAP needs to be developed based on the local antimicrobial susceptibility data.

Risk factors for 30-day mortality in patients with pneumonia who receive appropriate initial antibiotics: an observational cohort study

Shindo Y et al.

Lancet Infect Dis 2015; 15: 1055–65

http://www.sciencedirect.com/science/article/pii/S1473309915001516

Comment: Despite availability of broad spectrum antibiotics, pneumonia is still a challenging infectious disease with a significant mortality. In this prospective, observational study conducted at ten medical institutions in Japan investigated the risk factors for 30-day mortality in patients who received appropriate antibiotics. The 30-day mortality was 11% in the appropriated initial antibiotic treatment group and 17% in the inappropriate treatment group. Hypoalbuminemia, non-ambulatory status, acidaemia, tachypnea, and high BUN concentrations were independent risk factors of mortality in patients given appropriate initial antibiotic treatment. Patients with two or more risk factors were at a higher risk of death. Authors suggest that patients with two or more risk factors would need adjunctive therapies such as appropriate respiratory management, fluid resuscitation, nutritional care, prevention of aspiration, and physical therapy as well as appropriate initial antibiotics.

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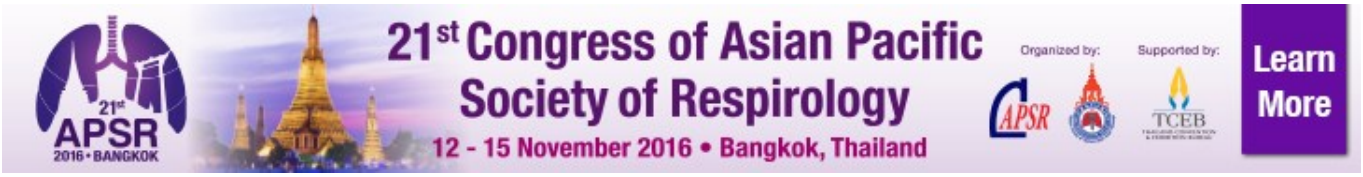

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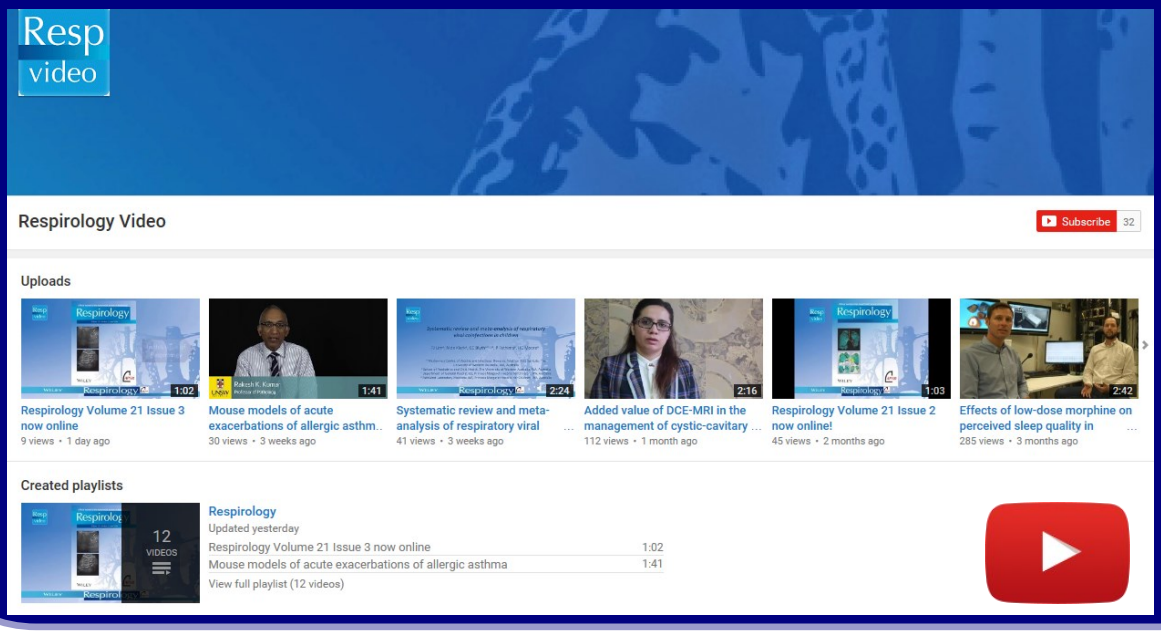

APSR Respiratory Updates is an initiative of the APSR Education Committee

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