Health PEI

ANTIMICROBIAL STEWARDSHIP SUBCOMMITTEE

Adult Chemical Pneumonitis & Aspiration Pneumonia

Key Messages

- Most people with aspiration **DO NOT** develop pneumonia and can be managed with a **watch and wait approach** - If patient is stable, monitor for signs and symptoms for 48 hours; antibiotics are not required.
- Antibiotic treatment for patients who develop fever, leukocytosis, and infiltrates in the first 48 hours after an aspiration event is likely unnecessary and may only select for resistant organisms
- Piperacillin/tazobactam is NOT first line therapy for hospital acquired "aspiration" pneumonia and should be reserved for patients that are critically ill.

Background

- **Aspiration/Chemical Pneumonitis** - an inflammatory response to chemical injury caused by inhalation of sterile gastric contents.
- **Aspiration Pneumonia** - an infectious process caused by the inhalation of oropharyngeal secretions that are colonized by pathogenic bacteria. Slow onset/non-acute process with persistent fever and hypoxemia.
- **Risk factors for aspiration pneumonia:** dysphagia; degenerative neurologic diseases (e.g. dementia, post-stroke, Parkinson's disease, multiple sclerosis); anatomical abnormality or mechanical interference of upper gastrointestinal tract (e.g. enteral feeding, nasogastric tube, endotracheal intubation); esophageal disorders (e.g. strictures, vomiting + small bowel obstruction, achalasia); altered level of consciousness (e.g. acute alcohol or substance abuse, seizures, CNS depressants, etc.); and cardiac arrest

Most Common Organisms

- **Aspiration/Chemical Pneumonitis –** sterile process, no organisms involved.
- **Aspiration Pneumonia** - Usual pathogens (depending on clinical scenario): *S. pneumoniae, H. influenzae, S. aureus*, Enterobacteriaceae, *Pseudomonas aeruginosa* (nosocomial), oral anaerobes, Streptococcus spp. Role of anaerobes controversial and historically has been overemphasized.

Treatment Criteria and Considerations

Aspiration/Chemical Pneumonitis

Description

- Episode of macroaspiration is often witnessed and typically occurs in patients with decreased level of consciousness
- Characterized by a sudden onset of prominent dyspnea, tachycardia, hypoxemia, low-grade fever, and crackles or diffuse wheeze
- Symptoms may range from mild to severe and can develop within 2 to 5 hours
- Pulmonary infiltrates are apparent on x-ray

Management

⇨ Prophylactic antimicrobial therapy is **NOT** indicated
⇨ Corticosteroids do not have a proven benefit
⇨ Recommend supportive care with humidified oxygen and chest physio
⇨ Reassess patient in 24-48 hours – may consider antibiotic therapy if signs and symptoms lasting greater than 48 hours (i.e. fever, cough, leukocytosis), x-ray evidence of infiltrate AND risk factors (receiving gastric acid suppression or enteral feeds, has a small bowel obstruction or gastroparesis)

Rapid clinical improvement within 24 to 48 hours typically indicates lack of pneumonia – if antimicrobial therapy was initiated then consider discontinuing

Clinical Pearls

- Employ measures to reduce future aspiration episodes (encouraging quality oral care, elevate head of bed, minimize time in supine position and reassess medications associated with CNS depression; consider swallowing assessment)

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Aspiration Pneumonia

Description

- Most are indistinguishable from CAP and HAP
- Slow onset over several days after aspiration event
- Usually a clinical diagnosis in a patient with predisposing risk factors to aspiration, compatible radiographic evidence occurring in dependent lung segment and characteristic clinical history indicative of infection (e.g. fever, cough, tachypnea, dyspnea, purulent sputum etc.)
- Right lower lobe most commonly implicated in ambulatory patients.
- Posterior upper and superior lower lobes most commonly implicated in bed bound patients

Infection Severity	Empiric Treatment	Comments
Mild-to-Moderate Illness **ADD** anaerobic coverage to cefuroxime, cefTRIAXone or levoFLOXacin if: • Poor oral hygiene • Severe periodontal disease • Putrid sputum • Suspected necrotizing pneumonia, empyema, or lung abscess▲	**Mild Illness (e.g. stable/adequate respiratory reserve):** amoxicillin-clavulanate 875/125 mg PO q12h* **OR** cefuroxime 500 mg PO q12h* If severe delayed reaction to a beta-lactam:[α] clindamycin 450 mg PO q6 – 8h **Moderate Illness (e.g. worsening symptoms & increasing oxygen demands/not tolerating PO intake/poor respiratory reserve[µ]):** amoxicillin-clavulanate 1000/200 mg IV q8h* **OR** cefuroxime 1.5 g IV q8h* **OR** cefTRIAXone 2 g IV q24h If severe delayed reaction to a beta-lactam:[α] levoFLOXacin 750 mg IV q24h*[§] **OR** clindamycin 600 - 900 mg IV q8h Anaerobic involvement suspected, **ADD**: metroNIDAZOLE 500 mg IV/PO q12h (for add on therapy to cefuroxime, cefTRIAXone or levoFLOXacin only)[‡] **MRSA Suspected, then ADD:**[£,∞] Vancomycin IV* (See Health PEI Firstline app or IV manual for dosing)	• If initially started on IV therapy convert to the PO route of administration when clinically improving, hemodynamically stable, able to take PO medications and have a normally functioning gastrointestinal tract ▲If evidence or clinical suspicion of necrotizing pneumonia, empyema, or lung abscess: • Recommend consultation to Infectious Diseases, Respirology OR Thoracic Surgery • Employ source control if appropriate **Duration of Therapy:** • **Aspiration Pneumonia:** 5 – 7 days (if good clinical response) • **Necrotizing pneumonia, empyema, or lung abscess:** treat with IV antibiotics for 3 – 6 weeks depending on clinical response and radiographic resolution
Severe Illness - requiring critical care support	Piperacillin-tazobactam 4.5g IV q6h* If true immediate penicillin allergy:[¥] meropenem 500 mg IV q6h* If severe delayed reaction to a beta-lactam:[α] levoFLOXacin 750 mg IV q24h*[§] PLUS metroNIDAZOLE 500 mg IV q12h **MRSA Suspected, then ADD:**[£,∞] Vancomycin IV* (See Health PEI Firstline app or IV manual for dosing)	

Clinical Pearls

- Most clinically important anaerobes are adequately covered by amoxicillin-clavulanate, piperacillin-tazobactam and meropenem
- Atypical coverage is not required in aspiration pneumonia
- Sputum samples are unsuitable due to inevitable contamination by normal flora.
- Do not treat Candida spp found in sputum unless systemic candidiasis suspected (e.g. neutropenic, transplant patients, etc.)
- For immunocompromised patients, recommend consulting infectious disease

* Dose adjustment required in renal impairment

‡ metroNIDAZOLE **NOT** an appropriate option for monotherapy, use as combination for added anaerobic coverage

£ MRSA risk factors: history of MRSA infection or colonization, household contact with a MRSA colonized individual, IV drug use, crowded living conditions (e.g. homelessness, incarcerated persons), recent travel to or residing in an MRSA endemic region or community.

∞ Stop vancomycin if MRSA not found on screening swabs or culture

μ e.g. BMI below 20, chronic CO_2 retention, home O_2, severe COPD or lung disease, pulmonary hypertension, age over 69, etc.

¥ Immediate, IgE mediated allergies include, but are not limited to, anaphylaxis, urticaria, angioedema, hypotension, bronchospasm, stridor, and pruritic rash. Refer to the Health PEI Beta-Lactam Allergy guidelines to determine which beta-lactams share similar side chains

α Severe delayed hypersensitivity reactions to beta-lactams are caused by mechanisms that are not well known and require that subsequent use of beta-lactams be avoided. Severe delayed hypersensitivity reactions can include interstitial nephritis, immune hepatitis, hemolytic anemia, serum sickness, severe cutaneous reactions such as Stevens-Johnson syndrome, toxic epidermal necrolysis, and drug rash with eosinophilia and systemic symptoms (DRESS)

These guidelines are an adaptation of New Brunswick Anti-infective Stewardship Committee **Adult Chemical Pneumonitis & Aspiration Pneumonia**

References:

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This document is designed to aid Prince Edward Island practitioners in the appropriate use of antimicrobials.
These guidelines provide general recommendations and are not a substitute for clinical judgement or consultation with Infectious Disease experts.