PENUMONIA

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WHAT IS PNEUMONIA-DEFINITION

P. is an infection of the lung parenchyma caused by various microorganisms:
-bacteria (aerobic, anaerobic. Bactria-Gram gram Callback request tone neg.)
-Mycoplasma, Chlamydia, Coxilla
viruses, protozoa, and parasites
- Mycobacterium (MTB),

NON-INFECTION P.

- Pneumonia occurring too after the action of various chemical substances, inhalation of gases and hot steam (P. toxica)
- Non-infection p. is immunological p.- pneumonitis

SYMPTOMS OF BACTERIAL P.

Cough: often producing mucus or puss, (called sputum). Sputum may be rusty or green or tinged with blood.

- Fever, which may be less common in older adults.
- Shaking, "teeth-chattering" chills.
- Fast, often shallow, breathing and the feeling of being short of breath.
- Chest pain that is often made worse by <u>coughing</u> or breathing in.
- Fast heartbeat.
- Nausea and vomiting and diarrhea -- not often, but may be

NON BACTERIAL PNEUMONIA

Symptoms of N-B pneumonia not caused by bacteria may come on gradually and are often not as bad or as obvious as symptoms of bacterial pneumonia. Many people don't know that they have nonbacterial pneumonia, because they don't feel sick. But symptoms may include:

- Fever
- Cough
- Shortness of breath
- Chest pain

Little mucus (sputum) when you cough

When symptoms are mild, your doctor may call your condition "walking pneumonia."

RISK FACTORS

People with underlying lung disease are more likely to develop CAP: COPD, emphysema, pulmonary fibrosis, bronchiectasiae, lung cancer, azbestosis pulmonum, cystic fibrosis, sequaele post TB, smooking, air polutions, etc. Alcocholism Diseases like as: diabetes mell., collagenosis-mixed ----Other malignoma, immunosupresive therapy or radiotherapy (treatment with corticosteroides or cytostatics)

P. IN OLDER (ADULT)

 The major sign of pneumonia in older adults may be a change in how clearly they think (confusion or delirium) or when a lung disease they already have gets worse.

EPIDEMIOLOGY

In the US, whatever. diagnosed 10-12 people per 1000 population (2-4 million),
> 65 ys. 21/1000 inhabitants. Above
> 80 ys. 46/1000 estates.

Mortality from p. 10 times greater than that of all infective disease together.

PATOGENESIS

- Typically, a virus reaches the lungs by traveling in droplets through the mouth and nose with inhalation.
- There, the virus invades the cells lining the airways and the alveoli. This invasion often leads to cell death either through direct killing by the virus or by self-destruction through apoptosis.

Further lung damage occurs when the immune system responds to the infection.

PATOGENESIS

 White blood cells, in particular lymphocytes, activate a variety of cytokines, which make fluid leak into the alveoli. The combination of cellular destruction and fluid-filled alveoli interrupts the transportation of oxygen into the bloodstream.

 Viruses also make the body more susceptible to bacterial infection; for this reason, bacterial pneumonia often complicates viral CAP.

BACTERIAL P- PATHOGENESIS

Bacteria and fungi also typically enter the lung with inhalation, though they can reach the lung through the bloodstream if other parts of the body are infected. Often, bacteria live in parts of the upper respiratory tract and are constantly being inhaled into the alveoli. Once inside the alveoli, bacteria and fungi travel into the spaces between the cells and also between adjacent alveoli through connecting pores. This invasion triggers the immune system to respond by sending white blood cells responsible for attacking microorganisms (neutrophils) to the lungs.

Bacterial p. – pathogenesis

The neutrophils engulf and kill the offending organisms, but also release cytokines, which result in a general activation of the immune system. This causes the fever, chills, and fatigue common in CAP. The neutrophils, bacteria, and fluid leaked from surrounding blood vessels fill the alveoli and result in impaired oxygen transportation. Bacteria often travel from the lung into the blood stream and can result in serious illness such as septic shock, in which there is low blood pressure leading to damage in multiple parts of the body including the brain, kidney, and heart.

MORE OFTEN CLASSIFICATION OF P.

A. COMMUNITY ACQUIRED PNEUMONIA (CAP) is pneumonia acquired infectiously from normal social contact (that is, in the community). Individuals have not recently been hospitalized develop an infection of the lungs (pneumonia). CAP is a common illness and can affect people of all ages.

B. HOSPITAL-ACQUIRED PNEUMONIA: opposed to being acquired during hospitalization or 1-7 days after leaving H.

CLASSIFICATION OD P.

TYPICAL P. – alveolair p.
 ATYPICAL P. interstitial p.

PODJELA P.

- TIPIČNE P. alveolarne p. Primarno uzrokovane tipičnim bakterijama s tipičnim auskult. nalazom nad plućima.
 - U KKS: leukocitoza, skretanje u lijevo
- ATIPIČNE P. ili intersticijske p. uzrokovane atipičnim agensima, auskultacija nad plućima uredna ili tek rijetke krepitacije.
- U KKS: Leukociti u gr. normale, u DKS može skretanje u lijevo (>neseg./ili granulitr. L)

CAUSES CAP and HAP

*

Mycoplasma pneumoniae S. pneumoniae, H. influenzae, Chlamidia pneumoniae, Legionella spp. Moraxella catharralis ananerob. bakterije usne šupljine, Nocardia sp. VIRUSI, Coronavirusi, Cytomegalovirus Pneumocystis carinii, i dr. HAP: P. aeruginosa, S. aureus, Enterobact. sp., Acinetobacter baumani, K. pneumoniae ESBL +

SYMPTOMS

General symptoms: fever, cilli, sheking, cough, cchest pain, breathless, malaksalost, mučnina, vomiting, diarrhoe, znojenje, haedeick, herpes labialis.

Important: epidemiology anamnesis

<u>Auscultation of lung</u>: rales breath in, we can hear bronchial sound-rhonchi, too.
 <u>Lab. fidings</u>: SR, L, DKS. Kreatinin, elektroliti, AST, ALT, yGT, LDH, CK i CRP.

Dokaz uzročnika

• Iskašljaj, obrisak ždrijela Hemokultura • Urinokultura Aspirat traheje Aspirat bronha ili ispiranje bronha (lavaža-BAL) Pleuralni punktat Punkcija pluća

 oral pills, while others must be hospitalized for <u>intravenous</u> antibiotics and, possibly, <u>intensive care</u>.

TREATMENT-THERAPY OF PNEUMONIA FORM:

M. NAWAL LUTFIYYA, PH.D., ERIC HENLEY, M.D., M.P.H., and LINDA F. CHANG, PHARM.D., M.P.H., B.C.P.S., University of Illinois College of Medicine at Rockford, Rockford, Illinois STEPHANIE WESSEL REYBURN, M.D., M.P.H., Mayo School of Graduate Medical Education, Rochester, Minnesota Am Fam Physician. 2006 Feb 1;73(3):442-450.

THERAPY

- Initial antibiotics (called <u>empiric</u> therapy).
 Additional consideration must be given to the setting in which the individual is treated.
- Most people are fully treated after taking oral pills, while others must be hospitalized for intravenous antibiotics and, possibly, intensive care.

ANTIBIOTICS

- Typically this is a macrolide antibiotic such as <u>azithromycin</u> or <u>clarithromycin</u> although a such fluoroquinolone as <u>levofloxacin</u> can substitute.
- Doxycycline is now the antibiotic of choice in the UK for complete coverage of the atypical bacteria

THERAPY OF P.

 Often, however, no microorganism is ever identified. Also, laboratory testing can take several days, which delays organism identification.
 for different organisms when choosing the initial antibiotics (called <u>empiric</u> therapy).

Alder patients

In 2001, the American Thoracic Society—drawing on work by the British and Canadian Thoracic Societies—established guidelines for the management of adults with CAP that divided individuals with CAP into four categories, based on common organisms

1. Healthy outpatients without risk factors

The primary microoganisms in this group are viruses, atypical bacteria, penicillin sensitive *Streptococcus pneumoniae*, and *Hemophilus influenzae*.

Recommended: macrolide antibiotic such as <u>azithromycin</u> or <u>clarithromycin</u> for 7 to 10 days.

2. Outpatients with underlying illness and/or risk factors

such as emphysema or congestive heart failure or is at risk for enteric Gram negative bacteria.

 TREATMENT: is with a <u>fluoroquinolone</u> active against Streptococcus pneumoniae such as <u>levofloxacin</u> only OR

a <u>beta-lactam antibiotic</u> such as <u>cefpodoxime</u>, <u>cefuroxime</u>, <u>amoxicillin</u>, or <u>amoxicillin/clavulanate</u>

plus

one of macrolide antibiotic such as <u>azithromycin</u> or <u>clarithromycin</u> for 7 to 10 days or <u>teraciclines</u>

3. Hospitalized individuals not at risk for Pseudomonas

- This group requires hospitalization and administration of intravenous antibiotics.
- TREATMENT: intravenous <u>fluoroquinolone</u> active against Streptococcus pneumoniae such as <u>levofloxacin</u> only

OR

beta-lactam antibiotic such as cefotaxime, ceftriaxone, ampicillin/sulbactam, or high-dose ampicillin

plus

an intravenous macrolide antibiotic such as <u>azithromycin</u> or <u>clarithromycin</u> for seven to ten days. Maby or <u>tetracyclynes</u>

4. Individuals requiring intensive care at risk for Pseudomonas

- One regime: intravenous antipseudomonal beta-lactam: cefepime, imipenem, meropenem or piperacillin/ tazobactam plus a i.v. antipseudomonal fluoroquinolon (levofloxacin)
- Other regime: i.v. antipseudomonal beta-lactam plus intravenous aminoglicoside sach gentamiocn, amikacin, tobramycin plus other macrolidi i.v. (azitromycin, clinclamicin)
- Non-pseudomonal fluoroqinolon is ciprofloxacin

CURB-65

The CURB-65 is a simple scoring system easily used in the outpatient office or emergency room setting, which assigns 1 point for each of 5 clinical features:

Clinical FactorPointsC = Confusion1U = Blood urea nitrogen > or = 20 mg/Dl1R = Respiratory rate > or = 30 breaths/min1B = Systolic BP < 90 mm Hg or Dias.BP<or=60mmHg</td>165 = Age > or = 651

Decision for hospital admission, with the CURB-65 score providing assistance with this decision.

If the cumulative score is 0 or 1, then most likely this patient could be safely treated as an outpatient.

A score of 2 might suggest closely supervised outpatient treatment, or inpatient observation admission.

A score of 3, 4, or 5 would usually indicate inpatient treatment.

Pneumonia severity index - PSI

Over 50 years of age Altered mental status (+20)Pulse ≥125/minute (+10)Respiratory rate >30/minute (+20)Systolic blood pressure <90 mm Hg (+20)Temperature <35°C or ≥40°C (+15)**History of:** Neoplastic disease, Congestive heart failure, Cerebrovascular disease, Renal disease, Liver disease.

Lab. findings

(+30)Arterial pH <7.35 Blood urea nitrogen ≥ 9 mmol/liter (+20) Sodium <130 mmol/liter (+20)(+10) $Glucose \ge 14 \text{ mmol/liter}$ Hematocrit <30% (+10)Partial pressure of arterial O2 <60mmHg (+10)**Pleural effusion** (+10)

GUIDELINES OF ANTIBOTICS THERAPY OF CAP PNEUMONIA

 BTS/ERS/ATS + (lokalni uvjeti !) s antibiotikom "pokriti" najčešće uzročnike CAP (S.pnuem. i M.pneum.): jedan od betalaktamskih ili cefalosporinskih antibiotika s ili bez tetraciklina (ili makorilida, azitromicina) 8-10 dana. Uspjeh Th. za 48-72 sata (pad temp., normalizacija L i DKS, poboljašnje općeg stanja). Ako nema uspjeha za 2-3 dana u kućnoj njezi, potrebna hospitalizacija.



















TUBERKULOZA

je specifična upala pluća – upala pluća uzrokovana Mycobacterium tuberculosis.

ETIOLOGIJA

Mycobacterium
tuberculosis
(MTB, BK)
Robert Koch:
24. ožujka 1882.
g.u Berlinu



MTB: bojenje po Ziel-Nilsenu



MTB: bojenje po Ziel-Nilsenu



MTB-elektronski mikroskop



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SIMPTOMI TB

<u>Opći:</u> umor, malaksalost, mršavljenje, znojenje (u zoru), supfebrilnost (karakteristično u popodnevnim satima) do visokofebrlnih stanja.
<u>Respiracijski simptomi</u>: kašalj (najčešće s iskašljavanjem gnojnog sadržaja)
Hemoptize
Bol u prsištu (pleuralna bol)
Zaduha

DIJAGNOSTIKA TB

- RDG snimka prsišta P-A i profil
- Iskašljaj: mikroskopski pregled (direkt.)
- Tuberkulinski test PPD₂
- Pleuralna punkcija (ako ima pleur. izljeva)
- Fiberbronhskopija: apsirat, lavat-BAL i TBB
- Biopsija dostupnih organa i njihova kultura na MTB (limf. čvorovi, koža, pluća, bubreg, vjeđe, slinovnica, kosti, itd.)
- Urin na MTB (barem 10x u nekoliko navrata)
- Quantiferonski test (QFT)







TB kože



LIJEČENJE

Dugotrajno

Kombinirano

Kontrolirano

LIJEKOVI: antituberkulotici

- Eutizon,
- Rifampicin,
- Pirazynamid
- Etambutol
- Streptomicin

 Ostali: amikacin, etionamid, PAS, cikloserini, ciklofosfamidi (moksifloksacin),azitromicin,

PLEURITIS

 Pleuritis sicca
 Pleuritis exudativa Empyema pleurae (gnojna upala pleure)

Uzroci pl. izljeva

- Upalne
- Maligne: primarne i metastatske
- Dekompenzacija raznih organa (srce, jetra, bubrezi)
- Traume
- Imunološke bolesti
- Kompresije na medijastinalne limf. vodove

- <u>Izgled izljeva</u>: bistar, zamućen, krvav, jantarne boje, mliječan
- Biokemijske karatkeristike: LDH, ukupni proteini, šećer (tm.biljezi, glikoproteini, mezotelin, RA, LE st.)
- Karakteristike: transudat ili exudat
- Citološka pretraga izljeva
- Mikrobiološke pretrage: nespecif. i specifilčni biogram

LIJEČNJE

Evakuacija
Uzročna terapija
Torakalna drenaža
Talkaža







