Pharmacotherapeutics One.

< Course Summary >

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Clinical applications of different bacterial infections

[A] CNS infections

There are 2 important types
⇒ Meningitis (most common)
⇒ Encephalitis

* Meningitis *

definition: inflammation of meninges that surround the brain and spinal cord are covered by connective tissues
its have 3 layers
[1] Pia mater [2] arachnoid mater [3] dura mater
* عندما احتوي meninges على CSF من spinal cord هو المشكلة
- اللي تخليني أعرف بوجود inflammation
⇒ inflammation of the meninges is cold meningitis

* There are many types of meningitis

Autoimmune
- inflammatory disease
(Systemic lupus erythematosus)
SLE
- Cancer
- Trauma رضة الدماغ
* مثل شخص سقط من فوق العمارة

infection
الأكثر شهرة
الأكثر انتشارا - bacterial infection
قليل الحدوث - viral infection
نادر الحدوث - fungal infection
لا تظهر في حالات متأخرة مثل HIV
• يعني بودعك آخر وداع ... ؟؟

⇒ Bacterial meningitis (most famous)

* They are Caused by many types of bacteria

1. Neisseria meningitidis
2. Streptococcus pneumonia, pneumococcal pneumonia
3. Haemophilus influenza
4. Listeria monocytogenes
5. G⊖ bacilli: ⟶ escherichia
6. Others
   ↳ mycobacterum tuberculosis
   ↳ staphylococcus aurus (G⊕ bacteria)

- كل نوع بكتيريا لها خطة علاج ولها أدوية

- Listeria monocytogenes —treatment→ Ampicillin

وإذا المريض عنده حساسية البنسيلين ← Cotrimoxazole

- Chloramphincol → Neisseria meningitis
  ↳ H. influenza

وهو يعتبر bacterocidal لهدول النوعين من البكتيريا.

* pathophysiology

* شو اللي صار بالزبط لحتى تحدث meningitis من البكتيريا، اللي صار إما

أو / أو

infection in URT
* أي untreated respiratory tract infection especially in the immunocompromised ptn. or defect in the immune system.
عم طول تنتشر و بتوغل لغاية م يصير meningitis

invasion of blood stream "Bacteraemia"
* عنده Septicemia وأهم consequence ↓ دخل في meningitis

Seeding and inflammation of meninges directly
* المشكلة في meninges نفسها

* عندما يكون defect in the host defense mechanism
عم طول تنتشر العدوى وتتوغل لتصل إلى meninges وتسبب meningitis

* Signs and Symptoms

أكثر حدوثاً * bacterial meningitis : جهاز المناعة : جهاز مرض، خصوصاً *

↳ ①S. pneumonia, ②N. meningitidis, ③H. influenza

④Listeria monocytogenes, ⑤G(−) bacteria, ⑥G(+) bacteria, ⑦TB

* Viral, fungal infection — أقل حدوثاً

* inflammatory condition — أندر الحدوث
"Autoimmune disease"

1. Fever 2. chills 3. poor appetite. 4. siezure
5. dyspnea 6. anarexia 7. irritability 8. delirium
9. diarrhea, vomiting 10. cyanosis 11. jaundice 12. abdominal distension
13. anterior fantanelle bulging — رأسه منفوخ

* مش شرط كل الأعراض تكون ظاهرة عند المريض

* physical examinations *

~~kernig's~~ sign.
"kernig's sign.

- severe stiffness of the hamstrings causes an inability to straighten the leg when the hip is flexed to 90 degrees.

* المريض ما بقدر يثني رجله
"بالعامية متخشبة" أو "متيبسة"
"متقسبة"

Brudzinski's sign.

- severe neck stiffness causes a ptn. hips and knees to flex when the neck is flexed.

* عند رفع رأس المريض
تنثني ساقيه تلقائياً

* diagnosis

* بعد عمل physical examination ، نعمل تشخيص لالتهاب ، وهو

- Microscopic examination , - Lumbar puncture.

[1] * سحب عينة من المريض aspiration from spinal cord

↓

CSF sample to do demonstrate and find of quisitive organism.

- هنشوف البكتيريا تحت الميكروسكوب

[2]

* analysis of CSF

- هنلاقي في changes في مكونات CSF

↳ Change in the protein

↳ Change in the glucose

↳ Change الاختلافات في تركيز و تركيب CSF

↳ Change in the blood gases

* هنا تأكد الطبيب أنها meningitis ، لما أخذ العينة وفحصها تحت المجهر ، بتكون عامل عينة ← culture sensitivity test

↳ to detect the type of organism and find the best antibiotic in the culture sensitivity test.

* كل عمر من الأعمار له نوع من البكتيريا تصيبه

⇐ أكثر عمر يصاب ب meningitis ← infants

(من أول يوم بالولادة لحتى شهرين أو ثلاثة)

* الإطلاع على الجداول في الكتاب...

Table 38.1 Cellular and biochemical responses in different forms of infective meningitis

Type of meningitis	Cell count	Protein (g/L)	Glucose
Bacterial	Predominantly polymorphs, 500–2000 μL^{-1} (lymphocytes may predominate in early or partially treated cases)	1–3	<50% blood glucose
Tuberculous	Predominantly lymphocytes, 100–600 μL^{-1}	1–6	<50% blood glucose
Viral	Predominantly lymphocytes, 50–500 μL^{-1}	0.5–1	Usually normal
Cryptococcal	Predominantly lymphocytes, 50–1000 μL^{-1}	1–3	<50% blood glucose

Box 38.1 Indications for chemoprophylaxis in contacts of cases of infection with *N. meningitidis* or *H. influenzae* type b

Neisseria meningitidis

Household and other close contacts: prophylaxis usually initiated as soon as possible by clinicians caring for the patient

- Persons who have slept in the same house as the patient at any time during the 7 days before the onset of symptoms
- Boy/girl friends of the patient
- Unless treated with ceftriaxone (which reliably eliminates nasopharyngeal carriage), the index patient should also receive antibiotic prophylaxis as soon as he or she is able to take oral medication

Healthcare workers: prophylaxis should only be initiated after consultation with hospital infection control team or public health doctor

- Individuals who have administered mouth-to-mouth resuscitation or had some other form of prolonged close face-to-face contact with the patient
- Other contacts: prophylaxis should be initiated by a public health doctor
- Schools, nurseries, universities and other closed communities where two or more linked cases have occurred

Invasive *Haemophilus influenzae* type b infection

Household and other close contacts: prophylaxis usually initiated as soon as possible by clinicians caring for the patient

- Indicated only where there is another child aged less than 4 years who has not been immunised in the same household as the index patient. In such circumstances, prophylaxis should be given to all household contacts aged 1 month or older, unless there are contraindications. The index patient should also receive antibiotic prophylaxis as soon as he or she is able to take oral medication

Other contacts: prophylaxis very rarely necessary and should only be initiated by a public health physician

Table 38.2 Suitable antibiotic regimens for treatment of acute bacterial meningitis in different age groups

Age group	First-choice antibiotic therapy	Alternative therapies
Neonates, aged <8 days	Ampicillin, 50 mg/kg twice daily or amoxicillin 25 mg/kg twice daily and cefotaxime 50 mg/kg twice daily or ceftazidime 50 mg/kg twice daily	Benzylpenicillin 50 mg twice daily and ampicillin 50 mg/kg twice daily or amoxicillin 25 mg/kg twice daily and gentamicin 2.5 mg/kg twice daily
Neonates, aged 8–28 days	Ampicillin 50 mg/kg four times daily or amoxicillin 25 mg/kg three times daily and cefotaxime 50 mg/kg three times daily or ceftazidime 50 mg/kg three times daily	Benzylpencillin 50 mg three or four times daily or ampicillin 50 mg/kg three or four times daily or amoxicillin 25 mg/kg three times daily and gentamicin 2.5 mg/kg three times daily
Infants, aged 1–3 months	Ampicillin 50 mg/kg four times daily or amoxicillin 25 mg/kg three times daily and cefotaxime 50 mg/kg three times daily or ceftriaxone 75–100 mg/kg once daily	
Infants and children aged >3 months[a]	Cefotaxime 50 mg/kg three times daily or ceftriaxone[b] 75–100 mg/kg once daily	Ampicillin 50 mg/kg four times daily or amoxicillin 25 mg/kg three times daily or benzylpenicillin[c] 30 mg/kg 4-hourly and chloramphenicol[d] 12.5–25 mg/kg four times daily
Adults	Cefotaxime[e] 2 g three times daily or ceftriaxone[b,e] 2–4 g once daily	Benzylpenicillin 2.4 g 4-hourly or ampicillin 2–3 g four times daily or amoxicillin 2 g three or four times daily and chloramphenicol[d] 12.5–25 mg/kg four times daily

Box 38.2 Recommended prophylactic regimens for contacts of cases of infection with *N. meningitidis* or *H. influenzae* type b

Meningococcal infection

Ciprofloxacin[a] *(oral)*

Children aged 1 month – 4 years	125 mg as a single dose
Children aged 5–12 years	250 mg as a single dose
Adults	500 mg as a single dose

Rifampicin (oral)

Children aged <1 year	5 mg/kg twice daily on 2 consecutive days
Children aged 1–12 years	10 mg/kg (max 600 mg) twice daily on 2 consecutive days
Adults	600 mg twice daily on 2 consecutive days

Azithromycin[a] *(oral)*

Pregnant women	500 mg as a single dose

Ceftriaxone[a] *(intramuscular)*

Children aged <12 years	125 mg as a single dose
Adults	250 mg as a single dose

Invasive *Haemophilus influenzae* type b infection

Rifampicin (oral)

Children aged 1–3 months	10 mg/kg once daily for 4 days
Children aged >3 months	20 mg/kg once daily (max 600 mg) for 4 days
Adults[b]	600 mg once daily for 4 days

[a]Not licensed for this indication.

[b]For pregnant women, obtain expert advice.

Table 38.3 Achievable CSF concentrations of antibiotics in meningitis and MIC values for common central nervous system pathogens

			MIC_{90} (mg/L) values for		
Antibiotic	CSF:serum ratio	Peak CSF level (mg/L)	*N. meningitidis*	*H. influenzae*	*S. pneumoniae*
Ampicillin	1:10	10	0.02	0.25	0.05
Benzylpenicillin	1:20	1.5	0.02	1.0	0.02
Cefotaxime	1:20	10	0.01	0.06	0.25
Ceftriaxone	1:15	15	0.01	0.06	0.12
Chloramphenicol	1:2	15	1.0	1.0	2.5
Ciprofloxacin	1:5	0.6	0.004	0.015	1.0
Daptomycin	1:20	3.0	>4.0	>4.0	0.25
Gentamicin	1:40	<0.5	2.0	0.5	16
Imipenem	1:15	2.0	0.1	1.0	0.05
Linezolid	1:1.25	5.0	>8.0	>8.0	2.0
Meropenem	1:15	4.0	0.03	0.1	0.1
Rifampicin	1:20	1.0	0.5	1.0	2.0
Vancomycin	1:40	1.0	>4.0	>4.0	0.2

MIC_{90}, minimum concentration of antibiotic that is inhibitory for 90% of isolates; CSF, cerebrospinal fluid.

Table 38.4 Antimicrobial regimens for treatment of shunt meningitis

Type of infection	First-choice antibiotic regimen	Other antibiotic regimens	Duration of therapy before reshunting
Internal shunt infection caused by Gram-positive bacteria	Intraventricular vancomycin + intravenous or oral rifampicin	Substitute flucloxacillin or intravenous vancomycin for rifampicin in cases of rifampicin resistance, except in the case of enterococci, where an aminoglycoside (e.g. gentamicin) should be used	7–10 days intravenous
External shunt infection caused by *S. Aureus*	As earlier, with the addition of intravenous flucloxacillin	Substitute intravenous vancomycin for flucloxacillin in the case of methicillin resistance (MRSA)	12–14 days
Enterobacteriaceae	Intravenous cefotaxime ± an aminoglycoside + intraventricular aminoglycoside	Substitute ceftazidime or meropenem for cefotaxime in the case of cefotaxime resistance	14 days
Polymicrobial ventriculoperitoneal shunt infections	Intravenous amoxicillin, metronidazole, cefotaxime ± an aminoglycoside + intraventricular aminoglycoside	Seek specialist advice	14 days
Candida	Intravenous amphotericin B + flucytosine	Intravenous fluconazole	10–14 days (antifungal fungal therapy should continue for 1 week after reshunting)

Table 38.5 Daily[a] doses (mg) of gentamicin and vancomycin for intraventricular administration

Antibiotic	Adult	Child ≥2 years	Child <2 years
Gentamicin	1.0[b]	1.0	1.0
Vancomycin	15–20	10[c]	10[c]

[a]If CSF is not draining freely, reduce dose frequency to once every 2–3 days.
[b]Dose can be increased to up to 5 mg in the most severe cases.
[c]Reduce dose to 5 mg if ventricular size is reduced, or increase to 15–20 mg/day if ventricular size is increased.

Table 38.6 Practice points in infective meningitis

Infection	Antibiotic	Common problems	Resolution
Bacterial meningitis	Chloramphenicol	Risk of serious toxicity, especially in neonates	Avoid use if possible Close monitoring of serum levels where use essential
Neonatal meningitis	Aminoglycosides (e.g. gentamicin)	Poor CSF penetration provides unreliable activity against Gram-negative bacteria Unpredictable neonatal pharmacokinetics (especially preterm neonates)	Substitute with, or add, an antibiotic with better CSF penetration (e.g. a cephalosporin) Close monitoring of serum levels
S. pneumoniae meningitis	Penicillin Cefotaxime or ceftriaxone Vancomycin (intravenous)	Resistance is increasing Treatment failure in meningitis due to penicillin Resistant strains Unreliable CSF penetration	Use cefotaxime or ceftriaxone ± vancomycin as empiric therapy Add rifampicin or vancomycin Consider one of the newer antibiotics with good activity against multiresistant Gram-positive bacteria
L. monocytogenes meningitis	Any	Relapse rate up to 10% after short courses of therapy	Give prolonged therapy (usually 3–4 weeks)
Cryptococcal meningitis	Amphotericin B Flucytosine Fluconazole	High incidence of side effects, for example fever, nausea, vomiting, anaemia, hypokalaemia, impaired renal function Risk of side effects, for example deranged liver function, bone marrow depression Low cure rate when used as monotherapy (except as consolidation therapy)	Change to lipid-based preparation of amphotericin B, or replace with fluconazole Close monitoring of serum levels Combine with flucytosine

* Pharmacotherapy of meningitis

3 goals of therapy ← (المريض) مريح الزبون *

1. Eradication of infection and microorganism, with
2. Amelioration of signs and symptoms
3. prevention of neurologic consequences

Complication of meningitis أهم وأشهر *

(*) الدكتور ذكر قصة /

قصة فيلم حضره في السينما في مصر "فيلم لنور الشريف"

ولد وحيد أهله عايش عند جده، وجده له منصب كبير بالبلد

والجد مرتشي دخل رياضة حبيب فخوشه للبلد، فشرب

هذا الولد من الحليب، وحصل معه meningitis

في آخر مقطع بالفيلم الولد بطل يشوف blindness

وصار عنده تشنج seizure بعدين إغماء Comma

ثم الموت death

شو استفدنا من القصة /

- إذا مريض meningitis ما يتعالج، وتضاعفت حالته
untreated neurologic consequences

النتائج المترتبة على ذلك

blindness → seizures → Comma → death

* بالتالي في حالة meningitis أهم هدف عندي هو
prevention of neurologic consequences and complications

How?!

by injection of dexamethasone + antibiotic

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* treatment and managment

. ttt of meningitis is antibiotics

لـ لأنه AB ؛ هتقضي على microorganism

لـ لأنه AB ؛ هتحسن الأعراض

لـ لأنه AB ؛ هتمنع neuroLogic Consequences

* The best treatment and the main treatment of meningitis is antibiotics

* لما يدخل المريض عالمستشفى ما بستنوا لغاية ما نكشف ونعرف نوع البكتيريا من خلال المزرعة لذلك بعطوه Empiric therapy (mix)

* إما أن نعطي المريض مضاد حيوي يكون متأكدين أنه broad spectrum antibiotics for all suspected microorganism.

أو نعطيه مجموعة من المضادات الحيوية (كوكتيل) mix

↳ Ampicillin , Gentamicin , cefotaxime

. these used before identification of the infection

* Ideal antibiotic عند اختيار المضاد الحيوي المثالي يكون
1. has appropriate spectrum
2. has no toxicity
3. Low development of resistant

Age Commonly affected	Most Likely organisms	Empirical therapy
- Newborn - 1 month	- G⊖ enteric - Streptococcus - Listeria monocytogenes	- Ampicillin + - cefotaxime or - ceftriaxone
- 1 month - 4 years	- H. influenza - N. meningitidis - S. pneumonia	- vancomycin + - cefotaxime or - ceftriaxone
- 5 - 29 years	- N. meningitidis - S. pneumonia - H. influenza	- vancomycin + - cefotaxime or - ceftriaxone
- 30 - 60 years	- S. pneumonia - N. meningitis	- vancomycin + - cefotaxime or - ceftriaxone
>60 years	- S. pneumonia - G⊖ enterics - L. monocytogenes	- Ampicillin + vancomycin + cefotaxime or ceftriaxone

Note/ Empirical therapy: "mix" توكيل
1. Ampicillin + cefotaxime
2. Vancomycin + cefotaxime
3. Ampicillin + vancomycin + cefotaxime

* Definitive specific treatment * علاج حسب نوع البكتيريا

[1] Neisseria meningitidis "Meningococcus"

• طالما حددت نوع البكتيريا ، إذن يختلف العلاج و تختلف فترة العلاج
على سبيل المثال:

N. meningitidis ← اكتاج أسبوع في العلاج
S. pneumonia ← اكتاج أسبوعين في العلاج
L. monocytogenes ← اكتاج 3 أسابيع في العلاج
G⊖ bacilli ← اكتاج شهر في العلاج

• الموضوع مبني بـ اختلاف بنوع البكتيريا ، كما اختلف بفترة العلاج

[1] N. meningitidis

• أول وأشهر وأبسط علاج high-dose IV Crystalline penicillin G
50,000 units/kg every 4 hours

• أو الآن في العلم الحديث ، بعد ما تطورت الأدوية
2nd or 3rd generation cephalosporin
(Cefotaxime, ceftazidime, Ceftriaxone ceftizoxime and cefuroxime)
لـ ① بتقتلوا ، ألتم فعالية على G⊖
② good penetration CSF لـ
③ Longest half Life لـ

• إذا المريض عنده حساسية من β-Lactams أو أن البكتيريا لم تستجيب للأدوية السابقة نعطيه Chloramphenicol
Is bacterocidal for N. meningitidis and maybe used as alternative therapy instead of penicillin especially in the resistance type or in patient hypersensitivity penicillin.

⇒ prophylactic drugs
- Ciprofloxacin
- Rifampin
- IM ceftriaxone + oral ciprofloxacin as alternative therapy as prophylactic for some ptn.

* هذه الأدوية مش شرط تعطى للمريضة فقط ، ممكن تعطى لأصحاب للوقاية من المرض

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2 Streptococcus pneumonia ⇒ pneumococcus or diplococcus

↳ drug of therapy

⇒ ceftriaxone + vancomycin are drug of choice for
GG⊖ GG⊕ G⊕ streptococci, pneumococci

• أسهل شيء لـ streptococci هو penicillin (فعوآمن ورخيص)

* penicillin may be used for drug-susceptible

• أما إذا فيه مقاومة للبنسلين نستخدم

⇒ ceftriaxone or cefotaxime

• وللتأكيد من عدم المقاومة نستخدم

⇒ Combination/ ceftriaxone + vancomycin

* vancomycin not used as monotherapy *

• يوجد دواء أكثر فعالية ، أكثر ثمناً (غالي)

⇒ Alternative therapy/ meropenem
LineZolide
flouroqunolone

• الدكتور شبهم بالطعم الحسيني إلي ما بطلع إلا للعزيز العزيز إلي أعز من حب العزيز.... 😂

* ملاحظة / حب العزيز موجودة في مصر تعتبر من المشروبات مثل الفستقية ولها فوائد كثيرة

3 Listeria monocytogenes

⇒ Penicillin G or ampicillin may result in only Bacteriostatic effect and possible persistence of infection

⇒ Combination/ Penicillin G or Ampicillin + Aminoglycosides results in a Bactericidal effect

• لازم المريض سيستمر على العلاج من أسبوعين إلى ٣ أسابيع لمنع relapse

⇒ Cotrimoxazole (Trimethoprim-Sulfamethoxazole) may be an effective alternative because adequate CSF penetration is achieved.

Sulfadiazine • هذا الدواء يصل بتركيز معقولة إلى CSF وخصوصًا

Trimethoprim + Sulfadiazine
↳ good penetration of CSF

4 Haemophilus influenza

• كان زمان يتعالج penicillin بطريقة

• Chloramphenicol were the drug of choice to treat pediatric meningitis.

⇒ 30% - 40% of H. influenza are now ampicillin-resistant
* 3rd generation cephalosporin (Cefotaxime or Ceftriaxone)
* Combination/ Chloramphenicol + Ampicillin for initial antimicrobial therapy
* Alternatives/ Cefepime مثل 4th generation cephalosporin
غالي الثمن Fluoroquinolones

5 G⊖ bacteria meningitis

• المسبب الأكثر صعوبة في حالات meningitis

⇒ Optimal ideal therapy for this type not defined

ليش؟!

• لأنه الأدوية الفعالة في حالة G⊖ bacilli لا تصل بكميات كبيرة CSF

خصوصاً gentamicin و aztreonam

⇒ treatment for G⊖ bacilli "pseudomonas aeruginosa"

* Antipseudomonal penicillins
  - ↳ Piperacillin
  - ↳ Ticarcillin
  - ↳ Aztreonam

* Aminoglycosides
  - ↳ Gentamicin

→ remains a unique problem because AB showing good antibacterial activity against P. aeruginosa such as
- antipseudomonal penicillins
- aminoglycosides

penetrate the CSF poorly

• الدكتور ذكر مثال / شخص مريض راح يتعالج في الداخل في مستشفى المجاهد، وقدّم أبوه وامه وأخوه.. طلب لمرافقة المريض ولا حدا تم الموافقة على طلبه من الاقويين الي بقدروا يساعدوا المريض ولكن تم الموافقة على طلب جده الكبير بالسن الي بدو حدا يساعده

شو بنستفيد من المثال / أنه الأدوية "antipseudomonal penicillin" "الأقوياء" ما بوصلوا بكميات وفيرة إلى CSF، لذلك نستخدم Combination

=> Combination

هذا الدكتور ذكر مثل / كبار القوم ولك شماتة العدو ويلي ...

"Synergistic" سوا مع 3 AB أو 2AB نستخدم / شو بنستفيد من ذكر المثل

يعني نستخدم 4 piperacillin + gentamicin + astreonam

cefotaxime / ع أدوية بيشيلوا البعض و بوصلوا ، إذا ما وصل واحد الثاني بيوصل وهكذا

• أو الحل الثاني / نعطي أدوية antipseudomonal direct penetration

Intrathecal injection

* Duration of treatment

- The Length of ttt for bacterial meningitis is based on the Causative Organism

=> Meningitis caused by S. pneumonia and H. influenza
10 - 14 days of AB therapy — أسبوعين

=> Meningitis caused by N. meningitidis
7 days course of AB therapy

=> Meningitis caused by L. monocytogenes or group B streptococci
Longer duration 14 - 21 days ; because they have a high probability of relapse. — 3 أسابيع

=> Meningitis caused by G⊖ bacilli
minimum of 4 weeks of AB therapy — شهر

• Therapy should be individualized and some patients may require longer courses

*Encephalitis *

- definition/ inflammation of cerebal tissue (Brain)

meningitis ← • أكيد ميكون من خلال هذا المرض

لذلك اسم المرض =

Meningoencephalitis

⇒ most commonly caused by a viral infection

Bacterial infection — meningitis عكس .

⇒ Encephalitis → infectious or noninfectious

• في أول حالة acute encephalitis بكون فيه edema, inflammation

في خلال : - cerebral hemisphere

- brain stem
- cerebellum
- spinal cord

• ميزة Encephalitis عن Meningitis

"نزيف تحت الجلد" Petechial hemorrhage

* What are causes encephalitis ?!

1- Viruses are the main cause.

⇒ children are vaccinated against many viruses such as: measles, mumps, rubella and chickenpox.

• الأطفال إلي أخدو التطعيم، فعلاً قلت نسبة احتمالية حدوث encephalitis عن الأطفال إلي ما أخدو التطعيم وهذا أكد أن سبب encephalitis هو viruses.

2- Bacteria

- البكتيريا التي ممكن أن تسبب encephalitis هي البكتيريا التي تسبب meningitis
- بعض أنواع البكتيريا مثل Atypical bacteria تسبب encephalitis
  - ↳ Mycoplasma
  - ↳ Richettsia

3- ممكن تكون Parasite or protozoa complicated لأمراض أخرى
  - ↳ Toxoplasma , Malaria , Amoeba

4. ImmunoCompromised states

5. Autoimmune reaction
   - ↳ Antibody-mediated Anti-NMDA receptor encephalitis Called Rasmussen encephalits
   - أعراض autoimmune تختلف عن غيرها من الأعراض
     1. Catatonia
     2. Psychosis ذهان
     3. Abnormal movement
     4. Autonomic dysregulation

* عبارة عن حركات غير طبيعية حركة اليد اليمين مع الرجل اليسار والعكس.

* في حالة مرضية اسمها limbic encephalitis عبارة عن inflammation in the limbic area of the brain.

* Symptoms of limbic encephalitis:
  1. disorientation
  2. disinhibition
  3. memory loss
  4. Seizures and behavioral anomalies.

* لما نسمع عن limbic area نتذكر "فيلم اللمبي"

⇒ limbic area in the brain

• منطقة مسؤولة عن الانفعالات و الأحاسيس
لما الواحد حاسس بالحب
لما الواحد حاسس بالغيرة

⇒ Some cases of limbic encephalitis Autoimmune in the brain or viruses

* Symptoms of acute encephalitis (Ingeneral)

[1] headache [2] fever [3] Confusion [4] Sometimes seizures

* إذا المريض طفل ؛ إذن الأعراض

[1] irritability [2] poor appetite [3] fever

neurological consequences * إذا تطورت الحالة يدخل في

Stiffness ؛ Confused ptn. ؛ drowsy ⇐ الطفل يكون
irritation of meninges يدخل في
"Meningoencephalitis" إذا المريض دخل لهنا الحالة بنسميها

*diagnosis

1. Lumbar puncture
   - ↳ CSF in spinal cord
2. Blood test
3. MRI : Magnetic Resonance Imaging ⟶
   differentiation و inflammation ◦ تبين
4. EEG : Electroencephalogram تخطيط الدماغ
5. PCR : Polymerase Chain reaction ◦

↳ testing of CSF from spinal cord detect the Characteristic presence of viral DNA is a sign of the viral encephalitis. ← of encephalitis

◦ أيضاً يتم PCR ← فيروس كورونا يتم أخذ عينة من الأنف للكشف عن وجود viral DNA

*treatment

- Antibiotics , steroids , Antiviral
- Symptomatic treatment for meningitis and encephalitis. ◦ هادي النقطة ما لتبعها بـ meningitis
  - ↳ Antipyretics ⇝ paracetamol
  - ↳ NSIADs
  - ↳ Fluids محاليل
  - ↳ Sedative ⇝ للتقليل من Convulsion و Seizure
  - ↳ Occupational , and physical therapy
  - ↳ Antidiarrheal , Antispasmodic
  - ↳ Muscle relaxant

- Sulfadiazine
- Pyrimethamine

لـ encephalitis

Toxoplasma أو Malaria ... يستخدم إذا كان السبب
خصوصًا عند immunecompromised patients

- Antiretroviral

* prevention:
  - vaccination

* Clinical applications of different bacterial infections *
[B] Applications on respiratory tract infections

Upper respiratory tract infection
⇒ Non specific URTI
⇒ Otitis media
⇒ Otitis externia
⇒ Sinusitis

Lower respiratory tract infection
⇒ Bronchitis
⇒ Pneumonia
⇒ Lung Abcess
⇒ Chemotherapy of Tuberculosis.

* Non specific Upper respiratory tract infections *

أسماؤه بالعامية/ :
دور برد ، دور إنفلونزا ، مرحلة أو مفلوزة ، رشيان بالأنف ...
ما في اسم محدد لهيك اسمه non specific URTI :

⇒ URTI / the most common reasons for visits to primary care providers.
include mainly nonspecific URTI, Otitis media, Sinusitis and pharyngitis.

⇒ Non specific respiratory tract infections لها مسميات ثانية
1. Acute infective rhinitis
2. Acute rhinopharyngitis / nasopharyngitis
3. Acute Coryza
4. Acute nasal catarrh
5. Common cold

* Most nonspecific URTI ⇒ Viral, not bacterial

* وبالتالي لا نعطي مضاد حيوي

⟸ • ليش نعطي المضاد الحيوي ؟!

• لأنه secondary infection صارت common

• غير هذا السبب / الجيل الحالي ـ جيل خريع

ماحفز جهاز المناعة و مقواه بـ raw materials

• نصائح الدكتور / كل يوم في الصباح : شرب كأس ماء دافئ وحليه ملعقة عسل ، وأكل 5 حبات من اللوز.
أو فطور بيض مسلوق لتقوية المناعة

* Nonspecific URTI —tend to→ resolve spontaneously

لم تختلف فترة resolution

* Some person resolve within 2 days

• يكون هذا الشخص مناعته قوية ، بشرب ليمون او دوار Immune
أو بشرب جوافة أو يأكل عسل أو فيتامينات ... الخ

* The enormous consumption of antibiotics for these illnesses has contributed to the rise in AB resistance among common community_acquired pathogens such as

- Streptococcus pneumonia
- streptococcus pyogenes
- streptococcus hemolyticus
- pseudomonas aeruginosa

- The Common Cold Caused by Viral pathogens
Such as: rhinovirus, parainfluenza, adenovirus, RSV, influenza, syncytial virus and Corona virus

- معنا بفاتة هذا المرض.
- Bacterial rhinosinusitis Complicates only about 2% of Cases

* Nonspecific URI is commonly described as an acute, mild and self-limited Catarrhal Syndrome with a median duration of one week.
⇒ not need antibiotics
⇒ without treatment بس self-limited

⇐ العلاج المستخدم في حالة nonspecific URTI هو
Symptomatic treatment

هدفنا نريح المريض / المريض يعاني من sneezing (عطس) ← نعطيه antihistamine
المريض يعاني من nasal congestion (احتقان) ← نعطيه nasal decongestant
" " " fever ← " antipyretic
" " " Cough ← " anticough
" " " hoarseness ← " soothing agents
" " " sore throat أو Laryngopharyngitis

*- diagnosis .

من أكثر لو استمر virus يعتبر هذا المرض non specific URTI .

5 أو 6 أيام secondary infection

وأيضاً مثال ع ذلك Bronchitis ⇐ أغلبها عبارة عن

Bacterial infection ـ أيام 5 من أكثر لو استمر viral infection

⇒ Although sore throat, nasal symptoms and cough may be present, there is no prominent symptom or sign

هذه الأعراض لا تستمر ؛ يتم علاجها بجهاز المناعة ؛ يتم معالجتها لوحدها to resolve spontanously

⇐ مكونات جهاز المناعة

T-Lymphocyte , B-Lymphocyte

phagocyte , natural killer cell

Lysosomal enzyme , immunoglobulin → IgE, IgG, IgA, IgM } antiviral, antibacterial, toxin

Cytokines (Interleukins, Interferon, Tumor necrosis factor alpha) , Compliments → C35, C3a, C5a, C5b } ⇒ proteins antiviral, antitoxins, Opsonin

لـ يعملوا عملية opsonization "قتل البكتيريا"

* دعاء سيدنا الخضر / بسم الله ما شاء الله لا يسوق الخير إلا الله ، بسم الله ما شاء الله لا يصرف السوء إلا الله ، بسم الله ما شاء الله ما كان من خير فمن الله ، بسم الله ما شاء الله ولا حول ولا قوة إلا بالله . ♡

* Treatment

⇒ the common cold resolves without antibiotics.

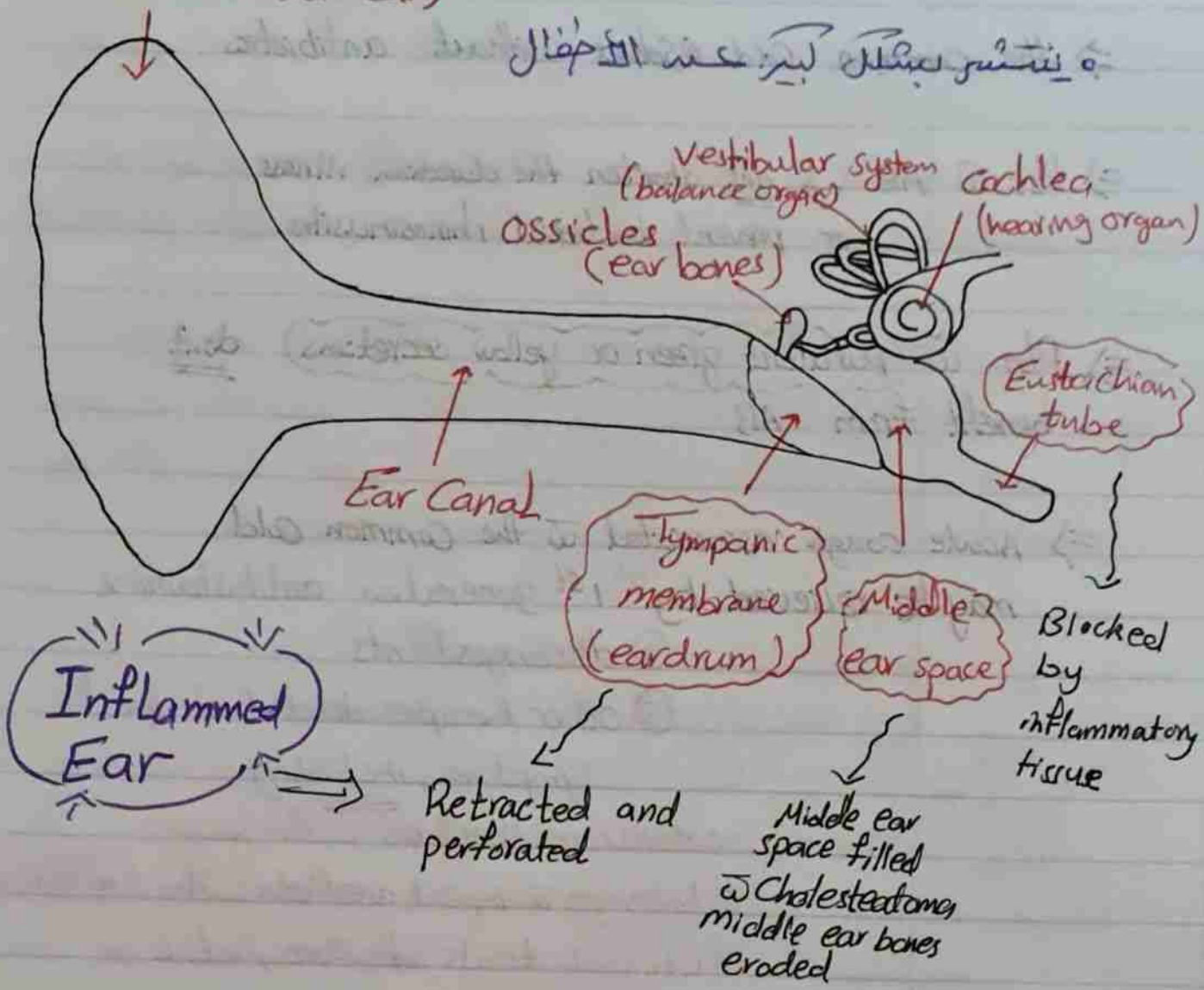
⇒ ttt ω AB → not shorten the duration illness or prevent bacterial rhinosinusitis.

⇒ Ptn. ω purulent green or yellow secretions don't benefit from AB

⇒ Acute cough associated ω the common cold may be relieved by ① 1st generation antihistamine
② decongestants
③ other therapies directed at specific symptoms, including:
⇒ dextromethrephan → for cough.
⇒ Lozenges ω topical anesthetic → for sore throat.
⇒ Clinical trials of Zinc, v.t. C, echinacea.

• هذا المرض سهل جداً وينتشر بشكل كبير.

Otitis media



* vestibular system (balance organ)

Chemoreceptor Trigger Zone

physiological signal transport dopamine and serotonin

* Otitis media : is an ear infection of the middle ear. the area just behind the eardrum.

⇒ It happens when the eustachian tubes, which connect the middle ear to the nose, get blocked w̄ fluid, mucus, pus and bacteria can also pool behind the eardrum, causing pressure and pain, irritation and impaired hearing

* Classification of otitis media

[1] Acute Otitis media : presents w̄ fever, otalgia, and hearing loss. * منتشرة عند الأطفال

اصحاب

[2] Otitis media w̄ effusion : evidence of middle ear effusion on pneumatic otoscopy

TTT : Augmentin® + Trufen plus®

[3] Recurrent Otitis media : inability to clear middle ear effusions

* منتشرة عند الأطفال ، الذين لم يرضعوا الرضاعة الطبيعية

[4] Chronic serous otitis media : presents as "fullness in the ear", tinnitus or another acute disease.

• منتشرة عند الكبار

*Colostrum milk حليب اللبأ

لبن السرسوب (عند المصريين)

* Signs and Symptoms

- There are 2 main types of ear infections
  - ⇒ acute otitis media (AOM)
  - ⇒ otitis media w effusion (OME)
- where fluid remains trapped in the ear even after the infection is gone.

⇒ Acute otitis media causes pain, fever and difficulty in hearing.

⇒ If a child is too young to talk, signs of ear infection can include: Crying, irritability, trouble sleeping and pulling on the ears.

* otitis media treatment must be suddenly and rapid; because otitis media may resolve spontenously without treatment within 3 days

⇒ Other symptoms that may be associated w an ear infection include sore throat (pharyngitis), neck pain, nasal congestion and discharge (rhinitis), headache, ringing (tinnitus), buzzing or hearing loss, plugged, popping

* Causes

⇒ Ear infections happen when the Eustachian tubes are blocked.

• Blockages can be caused by:

⇒ A respiratory infection, such as Cold or flu.

⇒ Allergies

⇒ Exposure to Cigarette smoke

⇒ Infected or overgrown adenoids (tonsils)

⇒ For infants, being fed lying down (drinking a bottle while lying on the back)

* Microbiology

otitis media ← microorganism

1. S. pneumonia
   ↳ Causes otitis media, pneumonia, Sinusitis, meningitis
2. H. influenzae ⇝ G⊖ bacteria, not virus
3. M. catarrhalis
4. Group A streptococci

• في حالة بكون resist ← وبتعبر Chronic

Pseudomonas aeruginosa وتسبب خروم في الأذن

↳ Infants w higher incidence of gram ⊖ bacilli.

recurrent ← تستمر فترة طويلة و بتعمل resist، والطفل بدخل في حالة recurrent infection وبالتالي تسبب خرم أو ثقب في طبلة الأذن نتيجة result perforation of eardrum

* Risk factors

- Age children b/w 6_36 months are most likely to get ear infections.
- Attending day care
- Recent illness such as: Cold or sinus infection.
- History of allergies like hay fever, also called: allergic rhinitis or sinusitis.
- Exposure to secondhand smoke
- Having family members who are prone to ear infection
- Using a pacifier رضاعة الأطفال

* goal of therapy

① تزيح المريض ... ^^

Symptoms relief ② تغطية علاج الأعراض ...

↳ analgesic, antipyretic + pseudoephdrine (Truten plus ® / Ultratren plus ®)

③ Eradication of microorganism

Amoxicillin + Clavulanic acid (Augmentin®)

لو الجرعة / 75 ملغم لكل كيلوغرام من وزن الجسم

لمدة 7 أيام

⇒ Augmentin ES® 625 mg
↳ specifically of otitis media.
↳ drug of choice of otitis media

* another choice of otitis media
- Cephalosporin ⇝ 2nd or 3rd generation
- Macrolids
- Cotrimoxazole ⇝ good treatment of otitis media

• زمان كان فيه مستحضر جميل عبارة عن
Macrolids + Cotrimoxazole
PediaZole®: Erythromycin + sulfisoxazole

* Chemoprophylaxis
• نستخدمها للناس اللي عندهم recurrent infections
• مثلاً / مريض معروف أنه كل شهر أو شهرين يصاب بـ otitis media
بنصحه بأكمل العلاج
Amoxicillin جرعة يومية لمدة 3 شهور من
or cephalosporin or Cotrimoxazole (Trimethoprim + sulfamethoxazole)
400 / 80 الجرعات /
800 / 160

* Myringotomy and tube insertion
• من طرق العلاج الأخرى
عبارة عن أنابيب very fine تنفط السوائل (في الناس المزمنين Chronic)

* Adenoidectomy
• آخر طرق العلاج
↳ استئصال اللوزتين واللحمية
• بالإضافة إلى وجود جهاز المناعة
لأنهم سبب لـ recurrent infection

* Otitis externa and its therapy *

" Swimmer's ear

• التهاب الأذن الخارجية ، لها اسم آخر = أذن السباح
• عبارة عن التهاب الجزء ، Canal

• سبب هذا الالتهاب هو ① دخول الماء
② ← تخدام أجسام غريبة
③ ← تخدام بخاخات الشعر
④ ← تخدام hair spray

* Symptoms as female أو male سواء يصيب الذكور

↳ Pain, redness, swelling of ear canal and itchy feeling in the ear.

شد شحمة الأذن — مضغ الطعام

↳ Pain when tugging the earlobe or when chewing food.

↳ Some ptn. report temporary hearing loss or their ears feeling "full"

↳ Ptn. may experience symptoms differently and at different levels of severity

* ملاحظة ؟: بكتيريا أكثر شيوعاً otitis externa | Pseudomonas aeruginosa |

* على ان تكون سبب otitis externa ← فطريات fungi

* وهذا تفسير أن أغلب قطرات الأذن التي تستخدم لعلاج otitis externa
تحتوي على :- Neomycin , Gentamicin
polymyxin , Tobramycin , Fluroquinolones
good effective agonst G ⊖
pseudomonas aeruginosa

* أيضاً من أحد الأسباب المشهورة لل otitis externa هو استخدام
سماعات الأذن

* What can you do ?!
[1] ندور على السبب ، [2] نحاول نتصح ، [3] نحاول نعطي علاج فعّال

* How is Swimmer's ear diagnosis ?
- Physical examination • الأذن محمرة ومتورمة ويوجد ألم عند شد الأذن
- A doctor may examine the ears using a device called an Otoscope • يظهر edematous in the ear canal
- Congested , redness , oedema ← Canal • يظهر حول
"Cerumen" يسمى ← earwax • يظهر أيضاً تراكم خفيف
← يعتبر حاجز ربانية يمنع دخول الأوساخ والغبار للأذن

* other causes of the ptn's symptoms, such as excessive ear wax
← تراكم شديد من wax , تنظيف غير صحي أدى ذلك لحدوث Otitis externa

* Treatment

⇒ The only and the drug of choice of atreatment of otitis externa

Topical antimicrobials

⇒ and prefer in conjunction with

Topical Corticosteroids

✓ - Neocort ®
✓ - Otodex ®
- Dexotic ®
- Dexatrol ®
- Otomycin ®
- Maxitrol ® eye drops

• في ناس ما بتحتاج قطرة على "نقطة زيت زيتون"

* هيك أشهر المضادات الحيوية المستخدمة :-

⇒ mainly aminoglycosides → ① neomycin ② polymyxin B → hydrocortisone ← يفضل إعطاء

is drug of choice

⇒ ③ Tobramycin
⇒ ④ Gentamicin

⇒ Quinolones → ofloxacin, ciprofloxacin → dexamethasone ← يفضل إعطاء

irritation ↓ the drugs

↳ ↓ edema , ↓ inflammation
↳ ↓ swelling , ↓ irritation

* Oral Antibiotics w Ear drops

* ملهوش فايدة إلا في حالات معينة :-

⇐ إذا المريض معاه "من ذوي الاحتياجات الخاصة"

⇐ إذا المريض مناعته ضعيفة

⇐ إذا المريض يعاني من recurrent infection

* Chronic otitis externa

⇐ إذا عرفت السبب بطل العجب

* الأسباب

① مدمن في استخدام سماعات الأذن

② العادات الخاطئة في نظافة الأذن

③ المريض سباح .

Analgesia

⇐ قد يحتاج المريض في بعض الأحيان إلى

• يفضل إعطاؤه ؛ لأنه خلقه الإنسان مجبول ... ؟

• لازم مسكن عشان نريح المريض من الألم

لغاية ما الدوا يشتغل ويعطي نتيجة .

محاضرة (3)

* Sinusitis * → acute / → chronic

⇒ Anatomy

There are 4 pairs of sinuses

- what are sinuses ?!

They are Cavities ⇝ air filled

* التجاويف الجيوب ، تكون فارغة (مليئة بالهواء) ، لا تحوي Pus أو Sputum أو Inflammatory cell .

⇒ 4 pairs of paranasal sinuses ?

1. Frontal : abave eyes in forehead bone.
2. Ethmoid : between eyes and nose .
3. Sphenoid : in center of skull , behind nose.
4. Maxillary : in cheekbones , under eyes.

• عندما تكون (sinuses) ملتهبة ، سيشعر المريض بألم عند لمس الوجه (مثلاً عند وضع مفياج) و سيشعر بألم عند السجود منطقة الألم حسب مكان الإصابة سواء كان الالتهاب في frontal or Ethmoid or Sphenoid or maxillary or all

- The host defense system (Celia , hair and epithelial cell in nose) work to keep this pathogen free in number of ways in a immunocompetent host Secretory IGA and proper mucociliary clearance through a patent ostivum prevent local mucosal damage .

* Types of Sinusitis <u>4</u>

[1] Acute sinusitis — symptoms last for less than 4 weeks. (شهر)

[2] Sub acute sinusitis — " " 4–8 weeks.
or Sub chronic

[3] Chronic sinusitis — " " more than 8 weeks. (شهرين)

[4] Recurrent — three or more episodes per year.

- لو مريض يعاني من acute sinusitis أسبوعين أو ثلاثة وتعالج منها وبعد بشهرين رجع يصاب مرة ثانية وهذا يسمى recurrent
- أكثر من 3 إلى 4 مرات بالسنة أصيب ب acute sinusitis تسمى ↑

* How Does Sinusitis develop?

- usually follows rhinitis, which may be viral or allergic
  ↓
  - بوجود risk factor
  - بوجود untreated cases

- May also result from abrupt pressure changes (air planes, diving) or dental extractions or infections.

- Inflammation and edema of mucous membrane lining the sinuses cause obstruction. —result/release→ inflammatory products, inflammatory cells

- This provides for an opportunistic bacterial invasion.

- ē inflammation, the mucosal lining of the sinuses produce mucoid drainage.

⇒ bacteria invade and pus accumulates inside the sinus cavities.

• مثال/ وأنتي في البحر، وتستنشقي هواء وتقوليلي يااااه
وتحسي ربنا إنه فتحات الأنف شغالة بشكل طبيعي. ويدخل
الهواء بشكل طبيعي.

• أما مريض sinusitis عندما يستنشق كمية من الهواء
يشعر ببرودته، لأنه بطانة الأنف (Lining) فيها مشكلة
(التدفئة المركزية)

• لازم نعالج هذا الخلل ببخار ماء وأدفي هذه البطانة

- Postnasal drainage causes obstruction of nasal passages and an inflamed throat.

- If the sinus orifices are blocked by swollen mucosal lining, the pus cannot enter the nose and builds up pressure inside the sinus cavities.

* Etiology of sinusitis

70% of bacterial sinusitis is caused by:

- Streptococcus pneumonia
- Haemophilus influenza
- Moraxella Catarrhalis

• عشان كدا طبيب أنف وأذن وحنجرة، زباينه نفسهم ما بتغيروا
والعلاجات نفسهم ما بتغيروا (بتتكرر)

30% Other Causative organisms are:

- Staphylococcus aureus
- Streptococcus pyogenes
- G ⊖ bacilli
- Respiratory viruses

* Predisposing Factors or Risk factors

- Allergies, nasal deformities, Cystic fibrosis nasal polyps and HIV infection → أكثر عرضة دائماً
- Cold weather ⟶ • لذلك يكثر في فصل الشتاء

• وأيضاً في انتشار حبوب اللقاح (فصل الربيع) مثل شجرة ليلة القدر

- high Pollen Counts
- Day Care attendance • الحضانة اليومية
- Smoking in the home
- Reinfection from siblings • مثل التوأم، لما تلاقي مشكلة عند واحد فيهم بتلاقي المشكلة صارت عند الثاني

• أحياناً بكون خلل في الأنف مثل اللحمية، فيه ناس بيتم معالجتها ولكن بتعاود ترجع تاني.

*DD: Differential - Diagnosis w other disease.

- Comparison of symptoms of Sinusitis, Allergies, Colds

	Sinusitis	Allergies	Colds
- Facial pain or pressure	Yes	Sometimes	Sometimes
- Duration of illness	more than 10 - 14 days	Varies	fewer than 10 days
- Nasal Discharge	Thick Yellow-green	Clear, thin, watery	Thick Whitish or thin
- Fever	Sometimes	No	Sometimes
- Headache	Sometimes	Sometimes	Sometimes
- Pain in upper teeth	Sometimes	No	No
- Bad breath	Sometimes	No	No
- Coughing	Sometimes	Sometimes	Yes
- Nasal Congestion	Yes	Sometimes	Yes
- Sneezing	No	Sometimes	Yes

* Symptoms of Acute sinusitis

[1] Acute pain

• يختلف مكان الألم مرة في Teeth ، ومرة في Frontal
ومرة في Maxillary حسب وين المكان المصاب.

[2] Nasal Congestion

[3] Nasal discharge . Yellowish - green

[4] Fever

[5] Sneezing

[6] Malaise and fatigue.

* Symptoms of Chronic sinusitis

[1] Nasal Congestion or obstruction

[2] Lost/decreased of sense of smell and taste.

• خصوصًا إذا أدمن decongestants، ويستخدم decogex مدة طويلة، ويستخدم قطرات الأنف فترات طويلة →

① rebound

② Loss of smell

③ atrophy of nasal mucosa

لتفادي هذه المشاكل يجب ان ننصح المريض
أن يستخدم decongestants سواء كانت
حبوب او قطرات لمدة 5 أيام فقط.

[3] Headach

[4] Snoring , sleep apnea.

5 Phonations problems • وخصوصاً عند الاستيقاظ من النوم
يكون الصوت خشن .... (مثل الحج عبدالعال 😄)

6 Halitosis • رائحة سيئة للفم (ليس من الأسنان)

7 Hoarseness • البحة (السعال) مثل صوت الحيوانات

8 Ear pressure

9 Vertigo

10 Frontal, Ethmoid or maxillary sinus pressure
• وخصوصاً عند الصلاة (في الركوع والسجود)

11 Postnasal drip, throat clearing, hoarseness, sore throat
• الشعور بأنه يعاني من التهاب في الحلق

12 Cough, worsening of asthma symptoms
• في ناس عندهم asthma وأيضاً يعانوا من sinusitis

13 Fever, general malaise
• المريض بحس حاله مش منيح

* في كثير ناس بيروحوا عند أطباء ويشعر المريض بألم أو خلل بـ prostate
بالرغم أن أعراض Chronic prostatitis تشبه أعراض Chronic sinusitis

* Diagnostic Tests

1 Imaging studies
- Sinus radiographs, ultrasonograms or CT scanning.

2 Laboratory studies
- Culture of sinus puncture aspirates.
• عبارة عن عود صغير له فتحة أو (ثقب) نضغط أو نسحب عينة
من المخاط (القيح) ← يتم زرع هذه العينة ثم إيجاد البكتيريا وزرعها
وإجراء عليها Culture sensitivity test ← حتى
نجد المضاد الحيوي المناسب

* Sinusitis Complications

- Chronic nasal obstruction — . دائماً أنفه مسكر
- Sleep apnea — . يعاني من خنقة النوم
- Anosmia — . نومه مش طبيعي
- Chronic sore throat.
- Orbital cellulitis
  - . عبارة عن التهاب طبقة من طبقات الجلد
  - . مثل مريض أنفه محمر احمرار شديد مع ألم لكن بدون رشح
- Brain abcess
- Meningitis and septicemia

* للتذكير / في "encephalitis" ، أحد أسبابها
  ↳ viral infection or bacteria infection untreated in sinusitis case

- Osteomyelitis
- General malaise and Chronic headache

⇒ Objectives for treatment

1. prevention of Complications — * أعتقد إنه للنوم *
2. Sterilization of sinus Content — عايزين نرجع زي زمان.......
3. resumption of normal sinus physiology

* How to make this ?!
  ⇒ eradication of microorganism.
  ⇒ symptomatic treatment (ex: decongestants)

* كيف أرجع الخلل لـ الطبيعي ؟
(Antimicrobial treatment)
for 10 - 14 days

* Antimicrobial treatment *

⇐ نستمر لمدة 10 - 14 يوم فقط

⇒ Amoxicillin

20 - 40 mg / kg / d in 3 divided doses

> 20 kg ⇝ 250 mg tid 3 مرات باليوم

⇒ Augmentin الأفضل

25 - 45 mg / kg / d in 2 divided doses

> 20 kg ⇝ 400 mg q_{12} مرتين باليوم

* The drug of choice of sinusitis

Amoxicillin , Augmentin

S. pneumonia ← ضد لأنه يعمل

H. influenza ←

M. Catarrhalis ↙ ✓

S. pyogenes

* Use chewable or suspension if child is

Less than 40 kg .

Amoxicillin

Sinusitis علاج كده Augmentin ← بدل ○

* Second Line treatment *

- Azithromycin
- Cefdinir
- Cefpodoxime
- Cefuroxime
- Ciprofloxacin
- Clarithromycin
- Clindamycin
- Doxycycline
- Gatifloxacin
- Levofloxacin
- Sulfamethoxazole / trimethoprim.

* Augmentin is drug of choice
  - ↳ Otitis media
  - ↳ Sinusitis

* Other Relief medications. *

⇒ For headache ⇝ Paracetamol + NSAIDs

Catamol®, Voltamol®, Combodex®

⇒ treatment of cough as analgesic for headache ⇝ Codeine

Paracod® → Paracetamol + Codeine

↳ For sever dry cough tid (narcotic ولكن ممنوع لأنه)

↳ For sever pain

⇒ Corticosteroids

○ إذن Cs في حالة acute بكون مع الأدوية السابقة

أما في حالة chronic تكون لحاله .

- Rhinocort nasal spray
  - 2 sprays in each nostril every 12 hours.
  - For Children over 6 years.

⇒ The cause of Chronic sinusitis is poly microbial

ttt / Long course of antibiotics

لوجود ضعف في المناعة

دعاء 😊

اللهم احسن خاتمتنا في الأمور كلها وقنا

من خزي الدنيا وعذاب الآخرة .... آمين

* OTC medication

⇒ decongestants

decongex®, paraflu®, flu tab®, Congestal®, Antiflu®

histafeed tab® ———

⇒ antihistamines in Chronic sinusitis

∘ لا تستخدم في acute ؛ عشان ما يعمل dryness

∘ تستخدم في Chronic بالتالي هستخدم Large half life

telfast®, Lorax®, Clarinase®

⇒ nasal saline (Non pharmacological treatment)

∘ تستخدم حبها؛ اسمها Humidifier

∘ الوضوء / عليه الاستنشاق في الوضوء

* Chronic Sinusitis managment *

- Chronic sinusitis is an (allergic) inflammatory disease. Contrary to common practice, Long term antibiotics are likely not useful.
- Istead **Corticosteroids**, (both) in intranasal form and, if necessary oral systemic form are more efficacious.

⇒ Chronic ⤳ Poly microbial ⤳ treatment last for at least one month

- نستخدم علاج prophylactic ttt في حالة Chronic
- من الأفضل أن نستخدم Corticosteroides

Corticosteroides → Intranasal / Oral Systemic

Intranasal
- Frenase®
- Flutisone®
- Allergo®
- Avamys®
- RhinoCort®

Oral Systemic
- Betacort®
- Prednisone®

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* Upper respiratory tract infec. خليها هيك نكون *

- ↳ Non-specific URI
- ↳ Otitis media
- ↳ Otitis externa
- ↳ sinusitis.

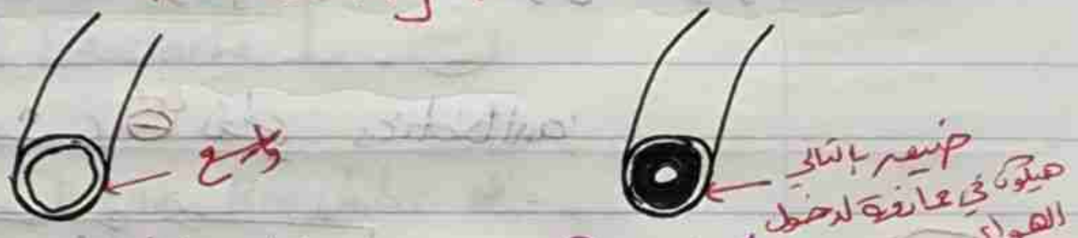
* Lower Respiratory Tract Infections

- ↳ Bronchitis
- ↳ Pneumonia
- ↳ Lung Abcess
- ↳ Tuberculosis
- ↳ Cystic Fibrosis

* Bronchitis *

- Bronchitis: is an inflammation of the mucous membrane of the bronchi (the Larger and medium-sized airways that carry airflow from the trachea into the more distal parts of the Lung parenchyma)

* Anatomy *



Normal bronchi | Bronchitis

mucous membrane مغطاه ب •
smooth muscle, celia احتوي ع •
air passage, wall

• حدث التهاب نتيجة أسباب مختلفة
inflammed bronchi
• ال mucous glands تفرز كمية
mucus أكثر ← Obsruction
• موجود بكتيريا وفيروس
في mucus
• وبدأت الخلايا تكبر وتتضخم
وصار edema
• يخرج صوت في الشهيق والزفير
"صوت تصفير"

* Bronchitis
a disease of winter

* Types of bronchitis
⇒ Acute
⇒ Chronic

- Acute bronchitis is a swelling and irritation of the air passage.

⇒ with acute bronchitis usually have cough that produced phlegm (بلغم) and be high breath ⇝ narrowing

لو البلغم يكون لونه أبيض في viral infection

لو ضيق بالتنفس
لو نهجة
لو ضغط ع النفس

* bronchitis most commonly occurs ̄w viral infection

* لما يجي مريض عم الصيدلية يعاني من Cough سببها Bronchitis ؟!

- إذن يحتاج إلى antihistamine ، Cough remedies ، Soothing agents ، علاج لتقوية المناعة ، وننصحه بشرب مشروبات دافئة والإكثار من السوائل ، والراحة

- ولكن بنعطيه ⊖ antibiotics

* rarely, bronchitis occurs ̄w bacterial infection may causes Acute bronchitis.

* تحدث نتيجة ضعف المناعة ، وسوء التغذية ، والأكل غير صحي

* تحدث عند الأطفال المصابين بالحصبة (Measles) والسعال الديكي (whooping cough)

- تكرر الـ attack (وتكرر الإصابة بـ acute bronchitis) في فصل الشتاء ، وأيضاً في فصل الخريف والحضر (تحدث فيه air pollution)

* Symptoms of acute bronchitis

1. deep cough that produce yellowish or greenish sputum.
2. pain behind breastbone when breath deeply or cough.
3. wheezy
4. Shortness of breath
5. Fever
6. Chills قشعريرة
7. Headache

⇒ • هذول الأعراض/ تميز هذا المرض عن Bronchial asthma

* Chronic Bronchitis *

- disease of elderly • وخصوصًا إذا كان مدخن
- disease of heavy smoking
- Occupational disease
  - • يعني إلي بشتغل في مختبر التحاليل (مختبر كيماويات) دائمًا بعاني من allergic chronic cough.
  - ↳ ex: Byssinosis Chronic bronchitis due to inhalation of Cotton dust. أنجرة
  - ↳ Chronic bronchitis due to inhalation of fumes of acid or gas ⇝ (إلي بشتغل في مختبر كيماويات)

COPD

← * مادام فيه الكرمن نوع، لكلهم اسمهم

Chronic obestruction pulmonary disease

- Chronic broncitis ⇝ one of the COPD

* virus or bacteria Can cased infect irritated bronchial tube.

• إذا دخل المريض في هذه الحالة رح يصير mucosa inflamed و irritated
فتكون good media للبكتيريا والفيروس ← infect

• وإذا المريض repeated breathing of fumes ← Lung damage

* إذن بدأت بـ inflammation وانتهت بـ infection
↳ virus
↳ bacteria
مثل ما احتجنا مع د. مازن ☺

↳ الطبيعي كان زمان / علاج bronchitis
هو Anti_inflammatory agents

↳ لكن حديثاً / Ampicillin or Amoxicillin
• كان يستخدم لفترة طويلة
• آمن (to safe)

* AB for Long Coarse ⟶ if it's a bacterial infection.

* What Causes bronchitis ?

⇒ Respiratory virus
- ↳ Syncytial virus
- ↳ Adenovirus
- ↳ Rhinovirus
- ↳ Influenza virus
- ↳ Parainfluenza virus
- ↳ Coronavirus

Consequence ← bronchitis

- ↳ Anatomical and Structural and physiological variations

⇒ Chemicals
⇒ Pollutants
⇒ Smoking
⇒ Irritants
⇒ Respiratory bacteria
- ↳ Pneumococci
- ↳ Streptococci
- ↳ H. influenzae
- ↳ Atypical bacteria
  - ↳ Mycoplasma
  - ↳ Bordetella pertussis

bronchitis → Amoxicillin Cephalosporin without benefit

السعال الديكي (whooping cough)

* The symptoms of acute and chronic bronchitis

⇒ Severe deep Cough
⇒ Shortness of breath
⇒ Chest discomfort, soreness and tightness in the chest.
⇒ Fatigue
⇒ Malaise
⇒ Poor sleep
⇒ Whooping Cough and sinusitis
⇒ production of mucus (sputum)
Clear White Yellowish-gray or green.
⇒ Headache
⇒ Blocked nose and sinuses
⇒ Aches and pain
⇒ * Acute bronchitis is Contagious
⇒ Tiredness
⇒ Nasal Congestion
⇒ * Dyspnea and cyanosis → COPD
→ impairs Lung function

* Treatment of bronchitis

① Get plenty of rest

② Drink plenty of warm fluids

• شرب كميات كبيرة من الماء، وشرب سوائل دافئة
مثل: بابونج، زعتر

③ Symptomatic treatment

↳ Paracetamol + NSAID

↳ anticough

↳ expectorants

↳ mucolytics

↳ Vaporizing بتخيره

↳ viscousty of mucous

④ Chronic bronchitis treatment

↳ Stop smoking

↳ Oxygen therapy

↳ Bronchodilators (Short-acting beta agonists)
في حالة COPD

↳ Antibiotics

Broad spectrum ← Oral antibiotics • لازم
(ttt for Long Course)

↳ Prophylactic therapy

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* في علاج acute bronchitis لازم المريض يبعد عن مسبب المرض مثلاً
Cotton dust، pollutants، irritants • يوقف التدخين، • مايتعرض إلى

* لا تأتي للشخص الطبيعي
* يصيب جهاز مناعي ضعيف → قوي.

محاضرة 4

pneumonia

*defenition: is an inflammatory condition of the lung (inflammation of the lung or infection of the lung.) affecting primarily the microscopic air sacs known as alveoli (responsible for gas exchange)

*Classification according to Causes

Infectious Case

Cause by mainly bacteria or viral or fungal or organism resembling fungi

⇒ Mono infection
only bacteria or virus

⇒ Mixed infection
both bacteria and virus

• عمومًا الناس إلي مناعتهم ضعيفة أول شي بصابوا بـ
virus ⟶ bacteria

Non infectious but inflammation case

"pneumonitis"

* مثال من الدكتور / لما تحصل حالة تطريقة زيادة عن اللازم و تحطي الكلور على الماء وتستنشقيه بحصل (pneumonitis)

↳ more broadly applied to any condition resulting in the inflammation of lung cause by chemical burns, drug reaction or Autoimmune diseases.

*Classification according to anatomical structure

Lobar
(involving only one lobe of lung)

non Lobar
(Multi lobe of lung)

* Classification according to symptoms

Typical ⇒ bacteria ⇒ (تظهر أعراض المرض واضحة)

Atypical ⇒ viruses

* Classification according to place of occurrence

Community-acquired pneumonia (CAP)

* البكتيريا المكتسبة من الشارع من الجامعة من المسجد من البيت إلخ

Hospital-acquired pneumonia (HAP)

* البكتيريا المكتسبة من المستشفى

Aspired pneumonia

* لما يكون أخذ بكتيريا أو vomiting أو oil يدخل الرئة (احتمال شرقة أو احتمال جاي من المعدة (Stomach)

* طريقة للتخلص من السم الموجود بالجسم؟!

- gastric Lavage غسيل المعدة
- Vomiting

* على أثناء gastric Lavage أو vomiting أو oil vomiting يدخل أو بكتيريا داخل الرئة

* بالشرقة يدخل أكل حامل معه بكتيريا داخل الرئة، معترض الجسم يطردها ولكن إذا ما طردها الجسم ينتج Aspired pneumonia

*Community-acquired pneumonia CAP microbiology

⇒ S. Pneumonia 20-60 %
⇒ H. influenza 3-10 %
⇒ Atypical bacteria
↳ Legionella 2-8 %
↳ Chlamydia 4-6 %
↳ Rickettsia
↳ Mycoplasma 1-6 %
⇒ Staphylococcus aureus 3-5%
⇒ Gram negative bacilli 3-5%
⇒ Viruses 2-13 %

* Risk factors
* Immunodeficiency (الأهم)
⇒ what are the component of respiratory immune system ?!
يعني immune system في respiratory tract
hair, Celia, mucus and cough reflex
Lysosomal enzyme, T lymphocyte, B Lymphocyte, Cytokine, chemical subs. (α trypsin)

نقصها يؤدي إلى emphysema منش عادية

* في ناس لو دخنت الرئة إدمرت بصير عندها خلل في α-antitrypsin أو نقص

* Smoking
* Alcoholism
* COPD ⇒ Chronic bronchitis , emphysema , bronchial asthma

عملية تطور حالتهم لحد pneumonia

* Chronic kidney disease

لو الأشياء كثيرة في المناعة، في المقاومة

فا رح قلة عندهم

لو على سبيل المثال /

in blood → very low RBCs

very low hemoglubin

cytokine , WBCs خلل في

* Chronic Liver disease
* Old age

⇒ Pneumonia is increase incidence in the old age than young age.

* Patients that use proton - pump inhibitors or H_2-blockers
(risk factor عالي بنسبة قليلة مش)

Bacterial pneumonia
(Typical pneumonia)

⇐ يصاب ببكتيريا معروفة شو بتعمل ، لذلك تنتج أعراض واضحة جداً للشخص منها نكشف

⇒ Typical pneumonia caused by bacteria and result typical symptoms

* أنمجة أعراضها زي ما بقول الكتاب ؟؟

| Ideal symptoms |

⇒ Pathogensis

- Most bacteria enter the Lungs via small aspiration of organisms residing in throat or nose.
  - ⇐ دخل من خلال throat أو nose ← once in lung
  - مجرد ما دخل lung ، البكتيريا تنتشر وتتوزع بين الخلايا
- Once in the lung, bacteria may invade the space b/w cells and b/w alveoli.
  - ⇐ بتدخل جهاز المناعة وبحاول يوقف البكتيريا ، يواجه البكتيريا مهاجمة مباشرة ← Phagocytosis
- Where the Macrophage and neutrophils (defensive WBCs) attempt to inactivate the bacteria.
  - T lymphocyte , Neutrophils ⟹ Cytokines
- The neutrophils also release cytokines, causing a general activation of the immune system.
  - ⇐ إذا صار activation لجهاز المناعة ← fatigue, chills, fever
- This Leads to the fever, Chills and fatigue common in bacterial pneumonia.
  - تظهر في viral pneumonia ولكن بشكل أقل

* لما الطفل الصغير يصاب ببكتيريا ← يسخن ← fever ؟!

- activation of immune system هذه السخونة عبارة عن
  and release of cytokines
- this result of activation of thermo-regulating center resulting in the fever.

* هذه إشارة إنه السلاح (المناعة) جاهز أو شغال وتقضي ع البكتيريا.

* fever علامة كويسة ولكن لازم نتحكم فيها ← Control fever
  عشان كدا احنا بنحاول نرجع Thermoregulating center
  ل regulate by non-steroidal anti-inflammatory drugs
  ← نوقفها، ونعالج السخونة

* بنعطي للطفل مضاد حيوي، لازم مناعته تكون إلا إذا استمرت السخونة أكثر ولم تستطيع المناعة التغلب عليها نعطيه Antibiotic

⇒ The neutrophils, bacteria and fluid from surrounding blood vessels fill the alveoli, resulting in the consolidation.

* آثار العدوان (neutrophils, bacteria, fluid) تتراكم (حرب قائمة)، تتراكم وتتكدس في lung.

* لذلك في أول أيام المريض، عندما الطبيب يعمل X-ray للمريض بتلاقي Consolidation

(Typical)

* Bacterial pneumonia usually has these Symptoms

⇒ High fever
⇒ Cough w thick greenish or rust-Colored mucus
⇒ Shortness of breath } ⇒ *Cynosis *dehydration *fatigue *abdominal pain
⇒ Rapid breathing
⇒ Sharp Chest pain that is worse w deep breaths
⇒ Abdominal pain
⇒ Severe fatigue.

* Atypical pneumonia * (viral pneumonia)

* Commonly Caused by viruses
  1. Rhinovirus
  2. Coronavirus
  3. Influenza virus
  4. Respiratory syncytial virus (RSV)
  5. Adenovirus
  6. Parainfluenzae
  7. Herpes simplex virus rarely causes pneumonia

الذكراها
حسين واضحة بشكل قوي

* The symptoms of viral pneumonia ← severity

1. Low fever
2. Chills
3. muscle aches *بحس جسمه مكسر
   *أما في typical ← مفش muscle aches
4. fatigue
5. Enlarged Lymph nodes in the neck
6. Chest pain
7. Sore throat
8. Coughing that usually brings up only a small amount of mucus.

*هنا بكح كميات خفيفة من البلغم ← لونها خفيف

*أما في typical ← Large amount of greenish color and rust-colored mucus → custer المخاط ملتول زي شكل

---

* How to diagnosed pneumonia.

1. Physical examination from the symptoms
⇒ If you have pneumonia, your Lungs may make Crackling, bubbling and rumbling sounds when you inhale.

2. Diagnostic Tests
↳ Chest X ray → .ما بحدد نوع البكتيريا
↳ Blood test CBC → .بحدد نوع infection سواء كانت
typical أو a typical ، بحدد WBCs innovation موجود أولا

↳ sputum test : a sample of sputum. Collected from you after a deep cough.

↳ Chest Chromatography
Chest Computed tomography scan (NMR)

↳ pleural fluid culture

↳ Bronchoscopy: is a procedure used to look inside the Lung airways.

* للناس الي عندهم severe chest disease
↳ bronchitis , pneumonia , TB
* ناخذ عينة أثناء bronchoscopy بنعمل مزرعة

نسحب عينة من داخل alveoli لنعرف نوع البكتيريا في حالات المرضى الخطيرة التي تحتاج الى وقت طويل من علاج antibiotics

---

* Treatment

⇒ Goals

1. Eradication of micro-organisms.
2. Relief of symptoms
3. Prevent of complications by

Antibiotics + Symptomatic treatment

Empirical therapy (to time) (Antibiotics) من الامراض التي تحتاج pneumonia *

↳ to prevent Consequence of Complication

Severe case : Cyanosis , dehydration عشان نمنع أنه المريض يدخل في *

Empirical

Definitive ← بأشكال ٣ Antibiotics *

prophylactic

* Treatment of pneumonia

[1] Antibiotics

Oral

- Amoxicillin الأفضل
- Amoxicillin + clavulanate (Drug of choice)

] penicillins

- Co-trimoxazole] sulfonamide

- 2nd generation cephalosporin
  - ↳ Cefaclor, Cefuroxime

- Atypical bacteria ← * إذا كان في شك بـ
  - ↳ Macrolides
  - ↳ Fluroquinolone

IV

- Amoxicillin
- Ampicillin
- Benzyl penicillin

] penicillins

- Cefuroxime] 2nd generation of cephalosporins

- cefotriaxone
- Cefotaxime
- ceftazime

] 3rd generation of cephalosporins

* يكثر في المستشفيات استخدام Rocephin → cefotriaxone.

* ملاحظة Atypical bacteria / تستجيب لـ Macrolides, Tetracycline

Empirical antimicrobial therapy for pneumonia in pediatric ⇐ الدكتور ناقش جدول

*Empirical antimicrobial therapy for pneumonia in pediatric ptns.

Age	Usual pathogen(s)	Empirical therapy
1 month	_Group B streptococcus _H. influenzae (nontypable) _E. Coli, S. aureus _Listeria, CMV, RSV _adenovirus.	_Amoxicillin _Ampicillin_sulbactam _cephalosporin _Carbapenem _Ribavirin for RSV
1_3 months (طفل ما عنده مناعة من أول يوم من الولادة (عيب خلقي في الجهاز المناعي) T lymphocyte قليل/معدوم immunoglobulin مش موجودة مش موجودة ربما يكون عنده عيوب بالخلقة ما يعيشوا لكبر	_Chlamydia, possibly ureaplasma _CMV, Pneumocystis Carinii (afebrile pneumonia syndrome) _RSV pneumococcus, S. aureus. (ابحث للمعرفة ^^) Genetic immunodeficiency ex: digeorge syndrome	Macrolide_azalide Trimethoprim _ Sulfamethoxazole Ribavirin semisynthetic penicillin cephalosporin
3 months _ 6 years	-Pneumococcus, H. influenzae _Rsv, adenovirus, Parainfluenzae.	- Amoxicillin or cephalosporin _Ampicillin sulbactam _Amoxicillin clavulanate _Ribavirin for RSV.
>6 years	-Pneumococcus, Mycoplasma-pneumonia, adenovirus	_Macrolide/azalide _Cephalosporin _Amoxicillin-Clavulanate.

CAP treatment

Outpatient

(4) IV hydration or Oral hydration
- to correct dehydration
- to ↑ water content in mucus or sputum.

[1] Empiric treatment

① - Macrolide
② - Doxycycline
③ - Fluoroquinolone

=> not in any specific order.

Doxycycline ليش ما طلبنا ⇒ لأنه بعمل مشاكل للبيرة؟

[2] Outpatient AB Choice

[1] Augmentin®
the first line outpatient AB for community acquired pneumonia in all ages.

[2] Macrolide the first line Outpatient of atypical bacteria (mycoplasma, Chlamydia)

[3] Co-trimoxazole
effective in treating cases of non-severe pneumonia caused by streptococcus pneumonia, H. influenzae.

[4] Amoxicillin more effective than Co-trimoxazole in cases of severe pneumonia caused by S. pneumonia, H. influenzae b resistance to Co-trimoxazole.

[5] Ribavirin → viral pneumonia
parainfluenzae, adenovirus, respiratory syncytical virus and cytomegalovirus.

[3] Symptomatic treatment.

① - Antipyretic and analgesic as
* Paracetamol®

② - NSAIDs
* Ibuprofen *

Paracetamol + Ibuprofen
- Combodex®
- Voltamol®
- Catamol®

③ - Mucolytic and expectorant to facilitate removal of sputum. (due to thick mucus)

[- acetylcysteine
[- bromohexine
→ بستغلوا بميكانيزم مختلفة

bromohexine
activation lysosomal enzyme.

acetylcysteine
يرتبط ب SH- لل mucus لإذابته
binding to disulfide bonds

تركيب mucus
mucopolysaccharide by disulfide bond

تلخيص المحاضرة السابقة

* CAP treatment

⇒ Outpatients

↳ Empiric treatment → Macrolids, Doxycycline, Fluroquinolones

↳ Antibiotic Choice
- ↳ Amoxicillin – Clavulanate (Augmentin ®)
- ↳ Macrolide → atypical bacteria
- ↳ Co-trimoxazole
- ↳ if Co-trimoxazole resistance → Amoxicillin
- ↳ Ribavirin → viral pneumonia

↳ Symptomatic treatment
- ↳ Antipyretic + analgesic → paracetamol
- ↳ NSAIDs
- ↳ Mucolytic and expectorant
  - ⇒ acetylcysteine , bromohexine
  - acetylcysteine ↓ MoA: binding to disulfide bonds
    - *عرتبط ب SH لل mucus ← لإذابته
  - bromohexine ↓ MoA: activation of lysosomal enzyme
- ↳ IV hydration or Oral hydration
  - ↳ to correct dehydration
  - ↳ to increase water content in the sputum

* Pneumocystis Carinii/Pneumocystis jiroveci * pneumonia (PCP)

⇒ Uncommon until 1980's ∵ emergence of HIV disease.

⇒ Caused by organism most closely related to fungi.

⇒ Mode of transmission unclear but felt to represent reactivation of latent infection

⇒ as a spontaneous pneumothorax Gradual Onset of Symptoms.

⇒ Common symptoms include
Fever, Cough, progressive dyspnea

⇒ Many patients asymptomatic

* Diagnosis
by microscopic examination.

* Treatment

trimethoprim + sulfamethoxazole ⇒ Co-trimoxazole ↑incidence of side effects in HIV ⇝ drug of choice.

⇒ Clindamycin + primaquine (antimalarial)

⇒ Pentamadine IV

⇒ Dapsone + TMP (Co-trimoxazole)

⇒ Atovaquone

✳ Aspirated pneumonia ✳

⇒ Aspiration of oropharyngeal or gastric contents is a common, but often unrecognised cause of pneumonia.

⇒ Type of pneumonia where the lung and the tubes leading to the lungs become inflamed, as the result of inhaling a foreign substance.

⇒ Acute lung injury following the aspiration of regurgitated gastric contents and results in a chemical burn of the tracheobronchial tree and pulmonary parenchyma w an intense parenchymal inflammatory reaction.

⇒ Aspiration could be caused by inhaling saliva, food, liquids, vomit or non_edible items.

---

* People more at risk for pneumonia.

"aspirated pneumonia" * الناس الأكثر عرضة لـ

[1] People w compromised or defect of immune system.

[2] People w recent surgical procedures

[3] People w certain disease

[4] People w developmental disabilities. الإعاقة

[5] The elderly or the very young.

Classification

[1] Aspiration of gastric acid Causes "Chemical pneumonia" Called
Aspiration pneumonitis
"Mendelson's Syndrome"
* بتحدث في الناس إلي عندهم ضعف في Sphincter بجسم عندهم
↳ regurgitation ارتجاع
* خصوصاً أثناء النوم
ex: Hiatal disease

[2] Aspiration of bacteria from oral and pharyngeal areas
"Bacterial pneumonia" aspirated.
* أغلبهم anaerobic bacteria
↳ Peptostreptococcus
↳ Fusobacterium
↳ Bacteroides

* يتطور هذا المرض، خصوصاً في مرضى نقص المناعة إلى Lung abscess

[3] Aspiration of OiL (mineral oil or vegetable oil) Causes (exogenous Lipoid Pneumonia) rare form of pneumonia.

* Microbiology *

=> Organisms responsible for aspiration pneumonia.

* Anaerobic organisms from the mouth.
Peptostreptococcus, Fusobacterium, and Bacteroides.

* Streptococcus Pneumonia predominates in community-aquired cases
* Staphylococcus aureus + G(-) " " hospital-aquired cases.

* Aerobic organisms have been conspicuously (غائبة بشكل واضح) absent

Anaerobic

* Therapeutic Guidelines for aspiration pneumonia

=> Drug of choice: Penicillin + Metronidazole

or Clindamycin ← بدل ما تدي الاتنين تستخدم
(وهو الأفضل)

* For severe aspiration or lung abscess
- penicillin + metronidazole 500mg IV 12 hours
- benzylpenicillin 1.2g IV 4-6 hours.

* If hypersensitive to penicillin
- Clindamycin 600 mg IV 8 hours as single drug.
(Clindamycin → Aerobic, Anaerobic)

* If G⊝ Pneumonia is suspected:-
- add gentamicin 4-6 mg/kg IV daily

=> alternatively, as a single agent

- Ticarcillin + Clavulanate 3.1g IV 6 hours

or - Piperacillin + Tazobactam 4.5g IV 8 hours

بيجي من → * **HAP** Called ~~> "Nosocomial infections"

* Hospital_acquired infections *

- UTI
- Respiratory infection → **HAP**
- Blood stream infection.
- surgical site infection

* هادي infections لا تظهر إلا بعد مرور 48 ـ 72 ساعة مكوث بالمشفى

* لكي احكم أن العدوى من المشفى (HAI)، لا بد أن يكون المريض ماكث لا يقل عن 3 ليالٍ بالمشفى.

Nosocomial infection ماهي البكتيريا التي تسبب *

1. Ventilator_associated pneumonia
2. Staphylococcus aureus
3. Methicillin resistant staphylococcus aureus
4. Candida albicans
5. Pseudomonas aeruginosa
6. Acinetobacter baumannii
7. Stenotrophomonas maltophilia
8. Clostridium difficile
9. Tuberculosis
10. Urinary tract infection

* Management of HAI التي تشمل HAP

[1] Line removal as appropriate.

* تأتي HAIs (عدوى المستشفى) من بلاط المستشفى، الشقوق الموجودة بالحيطان، على الأجهزة المستخدمة بالمستشفى، اجهزة الأكسجين.

[2] Antibiotics therapy covering (وتشمل) [G+ , G−], started empirically and then tailored according to specific susceptibility pattern

[3] Antifungal therapy as appropriate

[4] Antiviral therapy as appropriate.

(Broad spectrum antibiotics)

✳ Lung Abscess ✳

⇒ Consequence of pneumonia (untreated pneumonia or failed treated pneumonia) —Lead to→ Lung abscess

* Lung abscess: is a necrosis of the pulmonary tissue and formation of cavities containing necrotic debris and fluid caused by microbial infection.

⇐ إذا حصل inflammation و infection ، والجسم تغلب عليهم، وصار healing, regeneration of tissue. (طريق الوداود تودي، تعاود ....)

أما إذا البكتيريا تغلبت بحدث degradation ← damage ← necrosis — death
(طريق الوداود تودي ما تعاود ....) لها أنواع كثيرة

⇒ Types of necrosis

1. Coagulative necrosis
2. Caseous necrosis
3. Liquefactive necrosis
4. fat necrosis
5. fibrinoid necrosis
6. gangrenous necrosis

necrosis of lung tissue ⇐ يعني تغلبت البكتيريا ، ولم تعالج علاج صح
وأدى إلى حدوث focal collection

تعريف ②

* Lung abscess: is a focal collection of purulent materials (dead cells and bacteria) within the lung tissue, due to death of the surrounding tissue.

* The formation of multiple small (< 2 cm) abscess is occasionally refferred to as Necrotizing pneumonia or Lung gangrene or Lung abscess

* Both Lung abscess and necrotizing pneumonia are manifestations of a similar pathologic process.

* Failure to recognize and treat Lung abscess is associated w poor Clinical outcome.

* In the 1920s, approximately one third of patients w Lung abscess died. Dr. David Smith postulated that aspiration of oral bacteria was the mechanism of infection.

* He observed that the bacteria found in the walls of the Lung abscesses at autopsy resembled the bacteria noted in the gingival crevice.

محاضرة 5

* Lung abscess → consequence of pneumonia
في حالات → immunocompromised patients
→ failed treatment
→ progressive stages

⇒ especially in the old patients, smoker or alcoholism

* أغلب أنواع البكتيريا التي تسبب Lung abscess

typical
⇒ Staphylococcus aureus

anaerobic الأكثر إحداثاً للمرض
⇒ Fusobacterium nucleatum
⇒ Peptostreptococcus species.
⇒ Fastidious G⊖ anaerobe
⇒ Possibly, Prevotella melaninogenica

أكثر تواجدها في اللثة (gingiva)

Lung abscess Classification

Acute abscess
* يتم اكتشافها، تظهر أعراضها على المريض
* يتم فحصها بـ X-ray، وتظهر خلال أيام
⇒ are less than 4-6 weeks

Chronic abscess
⇒ are of longer duration
غالباً تؤدي إلى } death

* Lung abscess Classification *

Primary abscess

=> is infectious in origin caused by aspiration or pneumonia in the healthy host.

Secondary abscess

=> is caused by a preexisting condition (ex: Obstruction) spread from an extrapulmonary site, bronchiectasis, and/or an immunocompromised state.

- gingivitis
- Sinusitis
- pneumothorax
- brochiectasis

* Pathophysiology *

* Most frequently, the Lung abscess arises as a complication of aspiration pneumonia caused by mouth anaerobes.

* The patients who develop Lung abscess are predisposed to aspiration and commonly have periodontal disease.

* A bacterial inoculum from the gingival crevice reaches the Lower airways, and infection is initiated because the bacteria are not cleared by the patient's host defense mechanism

* الناس المصابين بـ Lung abscess دائماً عندهم gingivitis
واهمال يكون ما عندو أسنان (تبار السنة)

* This results in aspiration pneumonia and progression to tissue necrosis 7-14 days Later, resulting in formation of lung abscess.

* Lung abscesses can be further Characterized by the responsible pathogen, such as
→ staphylococcus Lung abscess
→ anaerobic or
→ aspergillus Lung abscess.

* Other mechanisms for Lung abscess formation include:-

1. Bacteremia or
2. Tricuspid valve endocarditis, Causing septic emboli (usually multiple) to the lung.
3. Lemierre syndrome, Suddenly an acute oropharyngeal infection followed by septic thrombophlebitis of the internal jugular vein, is a rare case Cause of lung abscesses.

The Oral anaerobe Fusobacterium necrophorum is the most common pathogen

* Lemierre Syndrome is a rarre and potentially Life-threatening infection.

- The bacteria typically responsible is Fusobacterium necrophorum, although a variety of bacteria types may cause the condition.
- The bacterial infection begins in the throat and spreads through the lymphatic vessels.
- Symptoms include sore throat and fever, followed by swelling of the internal jugular vein (IJV).
- Subsequently, pus-containing tissue moves from the original location to various organs, most commonly the lungs.
- Other affected sites may include: the joints, muscles, skin and soft tissue, Liver and spleen.
- Treatment indues the use of IV antibiotics.

* Risk factors of lung abscess

⇒ Coexistent conditions

1. Alcoholism
2. Smoking (Tobacco use)
3. Gingivitis
4. Obstructing neoplasm
5. Distant neoplasm
6. Seizure
7. Stroke
8. Corticosteroid use — * استخدام CS بكميات كبيرة و عن مزمنين (فترة طويلة)
9. Sepsis
10. Antecedent URI
11. Diabetes

Lung abscess Caused by

Anaerobes

⇒ Peptostreptococcus species
⇒ Bacteroides species
⇒ Fusobacterium species
⇒ Microaerophilic streptococci.

Aerobic bacteria

⇒ Staphylococcus aureus
⇒ Streptococcus pyogenes
⇒ Streptococcus pneumonia (rarely)
⇒ Klebsiella pneumonia
⇒ H. influenzae
⇒ Actinomyces species, Nocardia species and G⊖ bacilli.

* Lung abscess caused by

Nonbacterial and atypical bacterial

* بنسب قليلة جداً

=> Pathogens may also cause lung abscesses, usually in the immunocompromised host.

=> These micro-organisms include :-

[1] Parasites ⇝ Paragonimus, Entamoeba species

[2] Fungi ⇝ Aspergillus, Cryptococcus, Histoplasma, blastomyces and Coccidioides species

[3] Mycobacterium species

[4] Viruses

الدليل/ عند ظهور systemic antifungal بنستعمل لبيرة
بالذات في حالات نقص المناعة

* They're occur rare ⇝ in normal ~~patients~~ persons
but may occur in immunocompromised
by other than bacteria but by fungi or parasites

* Symptoms that appears in the persons w/ Lung abscess.

⇒ Symptoms depend on whether the abscess is caused by anaerobic or other bacterial infection.

⇒ Anaerobic infection in Lung abscess patrents often present w/ indolent symptoms that evolve over a period of weeks to months.

* The usual symptoms are :-

1. Fever
2. Cough w/ sputum
3. Night sweats
4. Anorexia
5. Weight Loss

* نفس أعراض TB

6. The expectorated sputum characteristically is **Foul smelling** and **bad tasting**
7. Patrents may develop **hemoptysis** or **pleurisy**

* هذه الأعراض تميز Lung abscess عن TB

* Diagnosis

[1] CXR , CT Chest

* من هذا الفحص يقدر الطبيب يجزم أنه المريض يعاني من
↓
Lung abscess or TB

[2] Difficult to isolate anaerobic bacteria

[3] If symptoms and clinical setting right for anaerobic infection, generally treat empirically.

[4] Gram stain : both +ve and -ve , mixed

[5] AFB and Anaerobic Culture

* Treatment of Lung abscess

⇒ Antibiotics

1 Clindamycin

- Standard treatment of an anaerobic Lung infection
  - 600 mg IV q8h → bolus dose
  - 150-300 mg PO qid

* Class Lincosamide.

* M.O.A: binds to 50s ribosomal subunit of rRNA.
Inhibits the initiation of peptide chain synthesis
  * protein synthesis inhibitor → Bacteriostatic
  * effective agonist ⊖ ⊕ bacteria
    - Anaerobic
    - Aerobic

* Antimicrobial spectrum
  - ⇒ Streptococcus spp., ⇒ Staphylococcus spp.
  - ⇒ H. influenzae, ⇒ M. Catarrhalis
  - ⇒ Bacteroides spp., ⇒ Fusobacterium spp.
  - ⇒ Veillonella spp., ⇒ Chlamydia trachomatis.
  - ⇒ Clostridia spp. of variable susceptibility prevotella spp.

* Pharmacokinetics Half life → approximately ≦ 3 hours.

* Adverse reactions ⇒ Superinfection or secondary infection

⇒ GI : diarrhea ⇝ C. difficile associated diarrhea

تظهر عند المريض ← pseudomembranous colitis

* treated by metronidaZole 500mg Tid

* لهذا السبب أطباء الأسنان يستخدموا Clindamycin + MetronidaZole لعلاج gingivitis

* وأيضاً بيستخدموهم معًا خوفاً من حدوث Lung abscess

* مثال من الباشور 😊 / أغنية عبد الوهاب
خايف لبلر يجينا يأخدنا من ليالينا

* المقصود أنه الطبيب خايف أنه مريض Lung abscess, يمرض من gingivitis

⇒ Skin : rash , anaphylaxis , Stevens-Johnson syndrome

⇒ CardioVascular : hypotension

⇒ GU : Cervicitis , Vaginitis

* Dosage.

- Capsule : 150 mg , 300 mg
- IV : 300 mg / 50 mL , 600 mg / 50 mL
  900 mg / 50 mL

[2] Parenteral penicillin قديماً بس

substituted by Cephalosporin
- ↳ more safe
- ↳ more effective
- ↳ Less side effect

[3] Metronidazole هو العلاج الأمثل

is an effective drug against **anaerobic bacteria**

penicillin + metronidazole ممكن تستخدم * في ناس بتستخدم
Clindamycin ما بستخدم

* Failure rate of **50%** due to ⇝ its polymicrobial

* غالباً علاج Lung abscess ⟵ لو تكيل من المضادات الحيوية.

[4] Moxifloxacin HCL® IV
"Fluoroquinolone"

⇒ used in adults 18 years or Older.

⇒ is Clinically effective and as safe as ampicillin + sulbactam in the tt of aspiration pneumonia and Lung abscess.

[5] Ampicillin + Sulbactam

⇒ is well tolerated and as effective as Clindamycin ⓦ or without Cephalosporin in tt of aspiration pneumonia and Lung abscess.

* Aspiration Lung abscess *

Treatments administered and their outcomes

⇒ Antibiotic therapy
- ↳ penicillin G
- ↳ Clindamycin
- ↳ Other (Metronidazole)

⇒ Postural drainage → expectorate large amount of sputum

⇒ Surgical treatment
- ↳ Drainage of empyema
- ↳ Pulmonary resection

⇒ Drainage of the abscess
- ⇒ Cure*
- ⇒ Death*

* Duration of therapy

⇒ Most clinicians generally prescribe antibiotic therapy for 4-6 weeks

⇒ Expert Opinion Suggests that antibiotics treatment should be continued until the Chest radiograph (X-ray) أشعة سينية على الصدر

resolution of lung abscess presence of a small stable lesion.

⇒ The rationale for extended treatment maintains that risk of relapse exists w/ a shorter antibiotic regimen.

* extended treatment ⇝ ↓ risk of relapse
↓ recurrent of lung abscess

* Shorter of antibiotics ⇝ lead to relapse and recurrent of lung abscess.

* Surgical Care

⇒ surgery is very rarely required for patients ῶ uncomplicated Lung abscess.

* إذا ما تطورت Lung abscess ، صارت Localized بلجأوا surgery
في حالة فشل العلاج

⇒ The usual indications for surgery are failure to respond to medical management, suspected
⇒ neoplasm or congenital Lung malformation.

⇒ The surgical procedure performed is either **Lobectomy** or **pneumonectomy**.

* Cystic Fibrosis *

⇒ CF is an inherited, autosomal recessive disease (genetic disease) ⇝ respiratory disease
that cause mucus in the body to become thick and sticky.

⇒ This glue-like mucus builds up and causes problems in many of the body's organs, especially the lungs and the pancreas

* Affected organs

1. The respiratory tract
2. Exocrine pancreas
3. Intestine
4. Male genital tract
5. Hepatobiliary system.
6. Exocrine sweat glands

* Causes

- CF is a monogenic disease caused by mutations in the CF transmembrane Conductance regulator (CFTR) gene.
- The changed gene is passed down in families
- To pass on this disease, both parents must be carriers of the changed gene.

* CF ← يأتي إما من الزوج أو الزوجة (وغالباً يأتي من الزوجة) monogenic

* إذا الزوج والزوجة عندهم CF ← أطفالهم هيلون عندهم CF

⇒ CF is a disorder of CL^- ion transport in epithelial cells, especially effects in the pulmonary and gastrointestinal system, other exocrine glands are also altered.

⇒ The Chloride ion transport dysfunction results in thickened secretions that typically lead to Obstruction, infection and inflammation in the airways.

CF ← سبب ← خلل في الجين specific in the certen gene

{ responsible for

Chloride ion transport

{ reult

dysfuntion of Chloricle ion transport

{ lead to

- ↓ water in the mucus
- thickened secretions

{ lead to

- Obstruction
- Stagnation of mucus

mucus is ... ← Thickened secretions *

↳ disulfide bonds + mucopolysaccharide (sugar)

↓

* good media for bacteria and fungi growth
* good media for growth of microbes

↓ result

infection and inflammation in the different parts espically airways

* Thickened secretions from the pancreas Lead to deficiency of digestive enzymes and bicarbonate

↓

- Malabsorption
- Maldigestion

⇒ Mucus from CF can interfere w works of the pancreas, Leading to impairing absorption of nutrients from food.

⇒ As a result, the child may not gain weight and may even lose weight.

⇒ Cystic Fibrosis is an inherited, autosomal recessive disease which at the cellular Level, is caused by a defect in the transport of ions in and out of cells.

- This Leads to changes in the consistency and chemical Composition of exocrine secretions.

- In the lungs, this is manifest by the production of very sticky, tenacious mucus which is difficult to clear by mucociliary action.

- The production of such mucus Leads to airway obstruction and infection

- These repeated infections lead to Lung damage and Branchiectasis

Pseudomonus aeruginosa GΘ bacteria

↳ is the most common pathogen isolated from people ẅ Cystic Fibrosis.

↳ its prevalence (انتشار) increases ẅ age, it's possible to clear 80% of early infections ẅ aggresive antibiotic therapy (Ciprofloxacin and an inhaled aminoglycoside) and so delay the onset of Chronic Colonization.

↳ Once Chronic Colonization ẅ P.aeruginosa is established, it's associated ẅ faster decline in lung function increased hospitalization and reduced survival Long-term Suppressive therapy ẅ inhaled antibiotics is used in these patients to slow the decline in lung function.

⇒ Fungi have also been increasingly recognised as important pathogens in Cystic fibrosis.

⇒ **Aspergillus Colonisation**

↓ leading to

allergic bronchopulmonary aspergillosis (ABPA)

- has been recognised for many years, but it has now also been suggested that it can cause exacerbations by producing a fungal bronchitis

- Scedosporium apiospermum and Wangiella (Exophiala) dermatitidis are being isolated more commonly

(Cystic Fibrosis Trust Antibiotic Working Group, 2009)

* Early signs and symptoms (منذ الولادة)

⇒ A blocked small intestine at birth, called a meconium plug or meconium ileus

⇒ Salty sweat or skin

⇒ little energy or losing weight.

* Symptoms

⇒ Symptoms of CF are usually caused by the production of thick, sticky mucus

Salty sweat or skin يحدث في intestine أكثر شيء ، ويحس عند المريض
(أملاح كثيرة متراكمة عن الجلد)

⇒ weight loss

⇒ unusual bowel movements, diarrhea that does not go away Large, greasy stools, very smelly stools or constipation.

⇒ Breathing problems or getting tired easily while playing

⇒ A cough that does not go away or wheezing

* الطفل المصاب CF عندما يصل عمر 3 سنوات يصبح نزيل بالمستشفى

↳ becuse he has recurrent infection especailly RTI

* Later signs and symptoms

⇒ Coughing up mucus that sometimes has blood in it.

⇒ Difficulty exercising or not being able to exercise.

⇒ Rectal prolapse, when part of the rectum protrudes from the anus.

* Additional symptoms may develop during late childhood or early adulthood, including :-

⇒ Clubbing (rounding and flattening) of the fingers

⇒ Polyps in the nose or sinuses

⇒ Infertility

← هذه الأعراض تظهر عند الطفل إذا كان في بيئة نظيفة و محافظة و صحية

← أما إذا كان الطفل في بيئة غير نظيفة ← recurrent problems especially respiratory tract infection
وسيكون نزيل دائم في المستشفى.

⇒ mucus-producing cells are found throughout the body in many different organs and systems, including the:

⇒ Lung and Respiratory systems

* لما يفرز thicky sputum في Lung , respiratory system يؤدي إلى

⇒ recurrent different respiratory tract infection
especially: pneumonia and bronchiectasis

وأيضاً يزداد sinusitis ، ويزداد oitis media في الناس إلي عندهم CF

⇒ Good chance for different micro-organisms growth → bacteria, → virus, → fungi

⇒ Pancreas and digestive system

• The first sign may be a meconium plug that prevents the passing of a newborn's first stool.

• Within the first year, a child may also have diarrhea that does not go away or large, greasy, smelly stools.

• Mucus from CF can interfere w̄ works of the pancreas, Leading to impairing absorption of nutrients from food.

• As a result, the child may not gain weight and may even lose weight.

⇒ ↑ sputum or ↑ mucus ⟶ Plugging (especially plug of pancreas and disturbance its function) بالتالي هيسكر ع منطقة ولتا في البنكرياس مسؤولة عن digestive enzymes secretion

* Pancreas cells
→ alpha → glucagon
→ beta → insulin
→ delta → digestive enzyme secretion

⇒ Sweat glands

- Salty Skin ; CF can cause a person to become easily dehydrated or to have very Low salt Levels.

* كيف بدي أعرف إذا الطفل بعاني من CF أو لا ؟
نضع الطفل على جهاز ← عشان يقيس وبعدها نفحص العرق
← إذا كان العرق لا يحتوي على كمية أملاح مثل العرق الطبيعي ← إذن الطفل بعاني من CF
← عرق المريض يكون مالح طبيعي

⇒ It's very important for pth. CF drink a lot of water and fluid ! very sticky mucus , and dehydrated

⇒ Reproductive systems
← أغلب Males إلي عندهم CF ← Infertile !؟
beacuse blockage of the tubes especilly in the Vas deferens in the testes.

← أما Females إلي عندهم CF ← Successful pregnancy ؟
but ↓
more difficult getting more than 1 – 2 children
← يعني ما بتخلف كتير

← مراجعة

* Cystic fibrosis : أغلب مظاهره respiratory ، وأكثر complication بكون في respiratory ولكنه بوضع في أكثر من مكان ؛ لأن Category تبعته genetic diseases

* هذا المرض ينتقل من شخص إلى آخر عن طريق الزواج ، يكون الزوج مصاب و الزوجة مصابة بنجيبوا طفل عنده high sticky thick mucus ويؤثر على

- ↳ [1] respiratory tract
- ↳ [2] digestive system
- ↳ [3] exocrine pancerase
- ↳ [4] intestine
- ↳ [5] male and female genital system

- يؤثر أكثر على male

- أما female ما بأثر على organ (organ of protective system of female)
إنما يؤثر على process of fertilization
لذلك ما بتخلف كثير (فقط مرة أو مرتين إذا الظروف تحسنت في وضع حدوث الحمل)

[6] hepatocellular system
[7] exocrine sweat gland

→ أكثر التي تتضرر هي respiratory , digestive (الظاهرة أوائل حالات)

digestive
↓
diarrhea
↓
dehydration

- people $\bar{c}$ cystic Fibrosis may have weaker bone than ←
other people

- يعني عظامهم ضعيفة وبنيانهم ضعيفة بالأخص مش salt ولا minerals
↳ Na ↳ Ca, Mg

- بصير عندهم Osteoporosis , Osteopenia

- weaken bones can lead to Bone fracture and osteoporosis
- " " " " " " swollen or painful joint
دائماً عندهم → Arthropathy and Arthritis.

DD skeletal ، reproduction ، skin ، GI يؤثر ع CF ←
أيضاً يؤثر respiratory ،

Complication لأن هدول مظاهر بتطور لما ما في المريض
كلها عبارة عن أعراض ""

* How to diagnose CF?

- From Clinical picture

[1] Sweat test مهم

- During the test, medicine that cause sweating (Diaphoretic drug) is applied on arms or thigh.
- Mild electrical current → to push the medicine into skin to cause child to sweat then sweat is collected and the salt content of the sweat Na^+ and Cl^- is measured compar them $\bar{c}$ standard ratio.

[2] Genetic test

- done to confirm the result of +ve sweat

← لو طلعت نتيجة sweat test إيجابية ← بنعمل هذا ال test للتأكد

↳ To detect the change in genetic material

(transmembrane conductance regulator gene)

← وبعدها بنعرف هل الشخص حامل للمرض او لا ؟

← مش كل شخص مصاب بالأعراض السابقة يعني عنده CF

⇒ Differential Diagnosis (DD)

DD ← ما هي الأمراض ذات الشبه الكبير لهذه الحالة (CF)

مثال/ هل هناك breathing prob. بأي مرض آخر غير CF ؟ إي

1 ⇒ Pneumonia
2 ⇒ Bronchial asthma

⇒ عندهم أعراض تشابه CF
very sticky mucus

3 ⇒ Bronchiectasis : Complication of CF

↳ Damage of airways

4 ⇒ Primary Ciliary dyskinesia

5 ⇒ Recurrent respiratory tract infection due to HIV or any immunodeficiency

6 ⇒ Problem in digestion and absorption of nutrient

← في ناس عندهم مشاكل في الهضم و الامتصاص، و فقدان الوزن و ضعف بالجسم، ولكن مش CF مثلا

[1] Lactose Intolerance [2] Ciliac disease

[3] Malabsorption Syndrome.

7 ⇒ Kwashiorkor , Marasmus

← أطفال عندهم مشاكل تغذوية ، لون شعرهم أشقر وأصفر عندهم نقص في البروتينات .

← حالة خطيرة Nutritional deficiency

← تؤثر على digestive enzyme والنها ليست CF

* What are the Complications of CF ?

[1] Respiratory Complications

1 _ Nasal Polyps

2 _ Tearing of Lung tissue, which traps air between the Lung and the Chest wall (pneumothorax) and may Cause the Lung to collapse.

⇒ Recurrent respiratory tract infection (bacterial or fungal)
لذلك المريض يبقى نزيل بالمستشفى — أشهرهم Aspergillus

← هناك أمراض تؤدي إلى أمراض مثلاً

CF —leads to→ Pneumothorax —leads to→ Atelectasis = Loss of expansion of lung after inspiration

- امتلاء الرئة بـ Sputum ← (Collapse Lung)

معناه أن الرئتين لا تنتفخ عند التنفس

* أحد أسباب Atelectasis هي CF

3 _ Expectorate recurrent infection leads to → expectorate Large amount of blood.

4 _ Enlargment right side of heart
Lead to → Heart failure

5 - Enlarged and damaged airways result in
→ Bronchiectasis
Lethal case
(cyst, Lung abcess)
- recurrant infection
- CF

6 _ Recurrent respiratory infection
bacterial
fungal
Aspergillus

[2] Digestive complications

1 _ Intestinal blockage

2 _ Mecanium

3 _ Rectal prolapse

4 _ Enlarged Liver and pancrease → So Loss its functions

↓ Leaf

Immunity + Digestion

espically sugar metabolism.

&

DM

5 _ Diabetes and inflammation of pancreas

→ Pancreatitis

acute — chronic

↓

CF leads to it

6 _ Due to malabsorption so osteopenia and osteoporosis.

[3] Reproductive system complications

→ In males : Infertility

→ In females : Don't affect development, but affect on chance of pregnancy.

* How to prevent CF ?!

(1) genetic disorder prevention ← عمل فحوصات قبل الزواج

(2) keeping immunization → Infection منع ←

(3) Stop Smoking

(4) use airway technique → to prevent mucus stagnation.

- ↳ Postural drainage
- ↳ Sucking mucus
- ↳ Chest percussion
- ↳ Chest massage.

(5) Eating nutrient and high Calories food.

* Treatment of CF

[1] Combination of medicine and home treatment

water nutrition.

⇒ Home treatment

(1) Trying to get rid of mucus التخلص من المخاط

(2) Eating healthy food

(3) Exercise to help prevent infection & complication.

[2] Respiratory Therapy

- To prevent Lung damage + Improve breathing

(i) ⇒ Reduction of infection (Antibiotics therapy)

← أكثر organism بيؤثر في CF

Pseudomonus Aeruginosa → G ⊖ resistance

هنختار كل المضادات الحيوية اللي تقضي عليها ؟

1- **Penicillin**
- → Anti-pseudomonal penicillin
  - Ticarcillin
  - Carbencillin
- or → Aztreonam or Meropenem.

2- **Cephalosporin** 3rd, 4th or 5th generation
- → ceftazidime 3rd generation
- → ceftobiprole → new cephalo., active agonist → pseudomonu / → MRSA

3- **Flowroquindone**

4- **Aminoglycoside**

(2) ⇒ Getting rid of mucus by using

1- Expectorants

2- Mucolytics

3- D-Nase enzyme → Bulk mucus مطرتكس

③ ⇒ Breathing exercise

- To strength the respiratory muscles used for good breath.

← تمارين تقوي عضلات التنفس

④ ⇒ Stimulate the cough

- To expel and Clear mucus

← بخلي المريض يكح عشان يطلع البلغم

← قديمًا / كانوا بيستخدموا صبغات (منعوها)
يحطوا الصبغة بخياشيمه والمريض يتنفسها ويصير يكح والكحة تطلع البلغم، الفائدة منها

- Inhalation lead to liquification of mucus
- Clear mucus

← حاليًا / بيستخدموا **Saline** أو **Hypertonic saline** مثل

Marimer[R] Isomar® hypertonic

⑤ ⇒ Bronchodilator, such as
Formoterol, Salmetrol, Albuterol → make breathing easy and make easy to expel mucus.

⑥ ⇒ D-Nase, such as pulmoZyme® which use to thin mucus in lung.

← عبارة عن lysosomal enzyme اللي بنشط تكسير mucus الموجود بالرئة.

⑦ => Mucolytic – Acetyl cystene , Carbocysteine
– Bromohexine
– Ambroxol

→ To thin mucus in lung and reproductive system

- Acetyl cysteine or Mucocare ← لما تيجي روشتة لامرأة فيها
- Tamoxifen or Ovaclomin

ما تستغربوا ... 😊

← الهدف من العلاج /

→ Liquify sputum in intestine to prevent Intestine, pancreas plugging
→ Liquify mucus in respiratory tract
→ Liquify mucus and facilitate reaching of sperm and ova to fertilize ← تانة mucocare دواء خلفة

⑧ => Inhaled water salt solution (hypertonic saline)
– To clear mucus form Lung

[3] Digestive Therapy

⇒ Digestive enzyme as :
- Spasmo digestin®
- Pankreoflat®
- Spasmo Canulase®

→ To help intestine to digest and absorption of nutrient from the food (absorb nutrient)

→ prevent intestinal blockage and constipation by Laxative, Enema
evacuation of stool using enema
and prevent blockage.

[4] Nutritional Therapy

⇒ Supplement of vitamins
⇒ Eating high calories and high fat food.
⇒ Getting food through tubes
⇒ Receiving IV, "Parentral Venous nutrition" (PVN)

- لو المريض مش عارف ياكل
- المرضى اللي ما بقدروا ياكلوا وعندهم امعاء

[5] Prevent and treatment liver cirrhosis

ex: Ursodeoxycholic acid → Ursofalk®

4 مضادات حيوية لكل فترة لمنع البكتيريا اللي بتسبب infection

(*) Antibiotics → to kill bacteria cause infection.
are often used to treat CF → to help and prevent infection

1. Anti-pseudomonal penicillin.
2. Carbapenem, Imipenem.
3. Ceftobiprole, Ceftaroline
4. Aztreonam
5. Netilmicin
6. Gentamicin, Tobramycin, Amikacin
7. Quinolone Ciprofloxacin, ofloxacin
8. 3rd generation cephalosporin ceftazidime, ceftriaxone
9. Colistin, polymyxin
   as inhalation and IV ـ كانت من أكثر المضادات الحيوية المستخدمة
   ولكن وقفوها بسبب Toxicity.

Complication Therapy → To prevent Complications
1. Antibiotics
   Flouroquinolones ← أكثر A.B مستخدم في حالة CF
   ↳ Ciprofloxacin → arthropathy نعالج CF لكنه بعمل
2. Anti-inflammatory drugs
3. Membrane stabilizer
4. Corticosteroids

محاضرة (7)

* Tuberculosis * T.B

→ TB : Communicable disease "Contagious" معدي

← مرض مخوف ومعدي ، قال الرسول صلى الله عليه وسلم "فر من المجذوم كفرارك من الأسد"
والجذام من عائلة TB

← TB : مرض مسبب بواسطة بكتيريا Mycobacterium tuberculosis

← من نفس العائلة Mycobacterium Libra تحدث الجذام

← ينتقل من شخص إلى آخر عن طريق الرذاذ أو الكحة أو العطس ولكن
الحمد لله ربنا وهبنا جهاز مناعي ← إذا دخلت في الوضع الطبيعي mycobacterium لا يؤثر
ولكن حلت تدخل وتكون Latent.

→ TB: mycobacterium TB → Latent or active

Active - progressive resulting in different pathological features and Clinical symptoms and active disease.

but **Latent** is silent disease, not activated and not progressive until immune system depressed or detected → progressive

← نفترض أن المرض progressive ولم يُعالج ↓
Left untreated or improperly treated
⇒ TB will progress and make different pathological feature stage of inflammation

- يبدأ بإحداث inflammatory reaction ، الجهاز المناعي متعامل معه كجسم غريب
هيبدأ تظهر Lymphocyte ، macrophage ← تتعامل معه بخطوات
مختلفة acute phase of inflammation إلى أن يصل إلى خطوة تكون فيها ↓
Characteristic Lesion of inflammation of TB
(Ghon's foci) تتكون عقد صغيرة (زي الدرنة) داخل الرئة اسمها

← ثم تنتشر في Lymphatic tussie في بعض أغلب الرئة ، ghon's foci
ويصير اسمها Ghon's Complex

← استمر المرض ولم نعالج ، استمر التدمير ، تظهر أعراض؟
ويحصل Destruction and necrosis of Lung cells

← تدمير خلايا الرئة في TB ، تعمل necrosis خاص ; Caseous necrosis

⇒ Types of necrosis
(1) Liquefactive necrosis → in brain
(2) Caseous necrosis → in lung — النكسيز بيترك زي جبنة أو لبن خربان
(3) Coagulative necrosis → in heart

← ليش mycobacterium أقوى من bacterium ؟!
* What are the properties of this micro-organism
mycobacterium TB ⟶ TB disease or
mycobacterium Libra ⟶ Leprosy disease. ?!

- it cell wall → high Lipid Content
- يحتوي على غطاء اسمه Mucolic acid ← يعتبر آخر غطاء
أبعد cell wall
- Slow growth
- لذلك في العلاج بيكون Long corse
- Survive Within Phagocyte
- إذا دخلت البكتيريا على Phagocyte ← مش هتموت البكتيريا وبالتالي
phagocyte مش هتقضي عليها ، وبالتالي احتاج إلى مساعدة Anti TB drugs

← بالتالي هذه Characters قوة mycobacterium ← Communicable, Strong disease.

⇒ what are the signs and symptoms?
"Clinical pictures"

← كحة مستمرة، كحة مع بلغم شديد (Yellowish w frank hemoptysis)

← تعرق بالليل مع سخونة شديدة (المريض يخرج بلغم منتظم)

← فقدان الوزن - فقدان الشهية

← إرهاق

1. unexplained wight loss
2. fatigue
3. Shortness of breath
4. high fever
5. night sweat
6. Chills
7. anorexia (loss of appetite
8. Coughing that lasts for 3 or more weeks
9. Coughing up blood = frank hemoptysis)
10. Chest pain
11. Painful breathing
12. pain when Coughing

⇒ Diagnosis

[1] Chest X-ray

[2] microbiological examination

[3] Skin test = Tuberculin test = Mantoux test

Subcutaneous under skin of inactived mycobacterium

Type IV hypersensitivity

[4] Chest CT scan

[5] Bronchoscopy

[6] Interferon-gamma release blood test such as the QFT-Gold test to test for TB infection.

[7] Thoracentesis

[8] Biopsy of the affected tissue (rare)

⇒ Goals of therapy

① prevent prophylaxis

↳ prevent of disease by prophylactic therapy

② Cure of clinical disease (prevent recurrence)

requirements / ① effective drug

② prolong therapy

③ combined therapy

resistance

← أكثر الأدوية بحصلها

1. Anticancer drugs.
2. Antituberculosis drugs.

Combined Therapy ← TB

← شرط من شروط علاج

لما أقل شي 3 أدوية

* Anti-TB drugs *

- The main drug for all types of TB

↓ TB عند كبار السن ، عند الأطفال ، عند pregnant

↳ active TB , Latent TB

treated by [1] **IsoniaZid**

Iso-Nicotinic acid Hydrazine (INH)

nicotinamide بذكرني بـ

↳ vit B_3 and vit B_6

⇒ used as treated and as prophylactic

← لحتى نعالجه Combination مع أدوية أخرى

* كيف نستخدمه؟

Bacteriostatic and Bactericidal

↓ at lost conc. to Latent

↓ to active

* MOA of isoniazid

inhibition of mycolic acid synthesis present in cell wall of TB → inhibit cell wall

→ All anti-TB develop for them resistance by microorganism

يعني ال microorganism التي تعرض ال resistance فترة جيدة

← يا ترى هنا أدوية لفترات وتكون ineffective ؟ لأنه ← microorganism developed resistance for them

يعني → organism make resistance to isoniazid and to other drugs

Multidrugs resistance bacteria

* pharmacokinetics

→ Isoniazid adminstered orally

→ Isoniazid is well absorbed and well distributed

→ Isoniazid reaches CSF

← يتركز في nicrotic material ، ليصل إلى خلايا necrosis في الرئة مثل ghon's foci

→ Isoniazid eleminated by after acetylation

← عشان يتكسر لازم يتعرض إلى phase 1,2 في metabolism ، حتى يخرج

هذا الدواء من الجسم لازم يكون acetyl form ← N-acetyl isoniazid

↓ acetylated by

N-acetyltransferase in Liver

يتحول إلى N-acetylisoniazid ← hepatotoxicity

← في ناس عندهم genetical → Slow acetylator

Rapid acetylator

acetyl form هيكون بسرعة

ويخرج بسرعة

* Side effects

→ Peripheral neuritis or neuropathy ⇒ Slow acetylator

التهاب في الأعصاب

← أشهر دواء يحدث Peripheral neuritis ← والناس يصير عندهم sensation, Parasthesia

خدلان، تنميل في الأطراف (لأنه مرتبط ...)

Isoniazid

↳ ω ptn. that have slow acetylator (genetically)

→ Hepatotoxicity ⇒ Rapid acetylator

→ Hematological reactions

- Thrombocytopenia
- Agranulocytosis
- Eosinophilia
- Anemia

تدخل vasculitis and arthritis symptoms ← يصير عندهم

في الناس اللي تأخذ isoniazid

2

Rifampicin

flouroquinolones

⇒ DNA inhibitors ↗ → rifampicin ↳ rimactane® 300

ـه قليل وجوده للأسف TB ولكن استخدامه كثير في high S.E

⇒ Bactericidal drug.
⇒ Broad spectrum antibiotics
⇒ Aganist active mycobacterium TB and G⊕ bacteria and G⊖ bacteria and Chlamydia.

* MOA (→ Bactericidal)
* rifampicin binds to DNA dependent RNA polymerase enzyme and inhibit their initiation (inhibit DNA synthesis)

→ كيف اكتسبه "a resistance

* إذا هذا الإنزيم حوّر نفسه → the mutation of this enzyme
↓ result
resistance of antibiotic

* Pharmacokinetic
→ well absorbed orally
→ Distributed all over the body even CSF
ـه لذلك يستخدم as prophylatic of meningitis

→ إذا دخل الجسم يصبغ كل secretions وحتى العدسات اللاصقة ← بلون برتقالي أو أحمر

→ Eliminated after enterohepatic circulation
enterohepatic cycling and biotransform
in the liver

→ Drug and their metabolite eliminated in feces

→ Rifampicin activate Liver microsomal enzyme induced

Liver microsomal enzymes Make induction of metabolism of other drugs!

← إذا المريض بياخد أدوية تانية، أدوية هتتكسر، تركيزهم هيقل، وتم وصف هذا الدواء

↓

Rifampicin ↝ عمل Auto-induction (induction for itself) بكسر نفسه

يعني بدأنا مع المريض بجرعة 300 mg بعد شهرين بدي أستخدم جرعة 500 mg

* الدكتور سمى هذا الدواء Rifampicin ← بالحطيئة ☺
معناها (الشاعر المخضرم) وهو أشهر هجاة العرب (كان يهجو كل الناس حتى نفسه)

← المقصود من هذه التسمية أن rifampicin بعمل induction لكل شيء حتى لنفسه

← أشهر Liver inducer enzyme ← **Rifampicin**

* Uses of rifampicin
- TB ↝ Combination of isoniazid (INH)
- Leprosy
- other bacteria infections
  - ↳ c̄ B-lactam ↝ endocarditis, meningitis
  - ↳ c̄ other drugs ↝ meningitis
- as prophylactics

* Side effect

ـــ يعتبر safe drug ، لكن بالمقارنة بالأدوية الأخرى له

→ Hepatotoxicity and Hepatic microsomal induction → short of half life of other drugs

→ Red discoloration of urine

[3] Ethambutol

[4] Pyrazinamide → ما يأثر على أي بكتريا إلا TB

→ not affect on any bacteria other than mycobacterium
→ Bacterostatic ~ Ethambutol
→ Use in resistance type of mycobacterium
ـــ الأنواع التي لا تستجيب أو ضعيفة الاستجابة لـ isoniazid أو rifampicin و other drugs ـــ بستخدم Ethambutol or Pyrazinamide

MOA of Ethambutol

→ Ethambutol : water-soluble, heat-stable compound inhibit arabinosyl transferase enzyme that inhibit Cell wall biosynthesis in the case mycobacterium TB

* Resistance of ethambutol

the mutation of arabinosyl transferase enzyme

↓

Ethambutol resistance

* Uses

Combination with other drugs in TB cases

* Side effect

- Visual acuity
  - ↓vision , green-yellow color
  - Optic neuritis (reversable)
- Dose dependant

• كلما زادت الجرعة ، زادت الحدة التي تؤثر على النظر (visual acuity)
ووصل (blindness) لو زودنا الجرعة كتير ممكن يؤدي إلى العمى
red-green color discrimination في صعوبة

- Peripheral neuropathy
- Hyperuricemia ⇝ Pyrazinamide > ethambutol
- Liver injury

(4)

Pyrazinamide

→ Bactericidal to mycobactrum TB
→ target site : mycolic acid fatty acid synthase enzyme
يثبط → mycobacterium fatty acid synthase
لم يتخصص تصنع mycolic acid
→ Inhibit mycolic acid synthase that is essentional for mycolic acid synthesis

* Pharmacokinetic

- Orally administred : 45 μg/mL — 1g/day
لا تصل الجرعة 1g في اليوم

Combinations ← يستخدم بكثرة مع الأدوية الأخرى
- Isonazid + pyrazinamide
- Rifampicin + "
- Streptomycin + "

- Eliminated by glomerular filtration —لأنه→ water-soluble

* Side effect

- Liver injury → have chich of S.E
elimination of uric acid ↓
أي مريض بياخذ pyrazinamide بعد كم يوم بصير يعاني من gout
- Hyperuricemia and gout symptoms
لم يسببه أكثر من ethambutol
- Joint pain (arthralgia)

[5] Aminoglycosides

Streptomycin **Amikacin**

[1], [2], [3], [4] and [5] ~ 1st Line therapy of TB

⇒ 2nd Line therapy of TB (other treatments)

- Cycloserine (يؤثر على cell wall) work on racemase enzyme (L-alanine ✗ D-alanine) ex.
- Amikacin ~ Aminoglycoside
- Macrolides
- Ethionamide
- Fluoroquindone
- Para-Amino Salicylic acid (PAS)

---

* Anti-Lepral drugs * : Leprosy ttt

[1] Rifampicin

[2] Clofazimine

[3] Dapsone ~ sulfa drug
↳ diamino phenyl sulfone

Clinical applications of different bacterial infections

GIT infections.

Diarrhea ORS

→ The most GI infections manifested by Diarrhoea.

*what is Diarrhoea?

→ Diarrhoea is the passage of Loose, Liquid or watery Stool.

→ In many regions Diarrhoea is defined as passage of 3 or more Loose or watery Stools in 24 hour period.

→ However it's the recent Change in Consistency and Character of Stool than the number of Stools that is more important.

→ In most Cases the mother knows what is abnormal Stool for her Child.

→ It's a killer disease in Children.

→ One in four deaths in Children under the age of 5 yrs, is due to diarrhoea.

GI infection ← diarrhoea

* What Causes Diarrhoea?

→ Infection Disease Agents Causing Diarrhoea.

- Bacteria

① Escherichia coli

It produces heat labile (LT) and heat stable(ST) entertoxins.

⇒ E.coli Could be

↳ Enteropathogenic → Causes infantile diarrhea.

↳ Enterotoxigenic → Causes travellers diarrhea

↳ Enteroinvasive → Dysentry type of diarrhea.

↳ Enteroadherent

↳ Enterohaemorrhagic → Diarrhea w Blood

② Vibro Cholera G⊖ bacilli: (short rod)

It produces enterotoxins.

→ Vibrio para haemolyticus invasive.

→ Non-cholerae Vibrios.

③ Shigellae:

④ Campylobacter jejuni

⑤ Salmonellae

⑥ Staphylococcus aureus

⑦ Clostridium perfringens

// difficile

- Viruses
  - Rotavirus - invasive
- Parasites
  - Entamoeba Histolytica - invasive
  - Giardia Lamblia - non invasive

GI لم تبقى في

⇒ what is the epidemiology of diarrhoeal disease?

1. Risk factors or determinants.
2. Agent factors

← العوامل المساعدة في حدوث الإسهال / الغذاء ، الخ

3. Host factors

← هل الطفل مناعته قوية أولا ؟

4. Environmental factors
5. Reservoir of infection

← من نقل المرض للمريض (من الوسيط) ؟

- How should acute watery diarrhoea in children be manage?

⇒ Assessment of diarrhoea ?!

* Dehydration : is the excessive loss of body water, with an accompanying disruption of balance of metabolic processes.

electrolytes عن ناتج ، metabolism عن ناتج .

→ Dehydration can be mild, moderate or severe based on how much of the body's fluid is lost or not replenished.

diarrhoea ← dehydration لـ سبب أكثر .

⇒ In humans, dehydration can be caused by a wide range of disease and states that impair water homeostasis in the body.

. These include :

(1) prolonged physical activity مع Sweating without consuming adequate water.
(2) prolonged exposure to dry air
(3) Blood loss (نزيف) or hypotension due to physical trauma
(4) Diarrhea
(5) Hyperthermia
(6) Shock (hypovolemic)
(7) Vomiting
(8) Burns
(9) Excessive Consumption of alcoholic beverages.

→ Dehydration from GI infections is the second Leading Cause of morbidity and mortality worldwide, especially in infants and Children younger than 5 years of age.

← السبب الثاني في الوفيات في الأطفال dehydration

→ The most important for Cause dehydration is diarrhea

→ Infants and Children are more Likely to become dehydrated than adults because they weight less and their bodies turn over water and electrolytes more quickely. The elderly and people w illnesses are also at higher risk.

* Mild to moderate dehydration is likely to cause :-

[1] Dry, Sticky mouth
[2] Sleepiness or tiredness. Children are likely to be less active than usual.
[3] Decreased urine output - no wet diapers for 3 hours for infants and 8 hours or more without urination for older children and teens.
[4] Few or no tears when crying
[5] Thirst
[6] Dry skin
[7] Headache
[8] Constipation
[9] Dizziness or Lightheadedness

* Severe dehydration, a medical emergency, can cause:

[1] Extreme (severe) thirst
[2] Extreme (severe) fussiness or sleepiness in infants and children irritability and confusion in adults.
[3] very dry mouth, skin and mucous membranes
[4] Lack of sweating
[5] Little or no urination - any urine that is produced will be dark yellow or amber
[6] Sunken eyes
[7] Shriveled and dry skin that lacks elasticity and doesn't "bounce back" when pinched into a fold.

[8] In infants, sunken fontanels – the soft spots on the top of a baby's head.

[9] Rapid heartbeat

[10] Rapid breathing.

[11] Fever

محاضرة (8)

→ Examples of GI infections
shigellasis, Salmonellosis (Bacillary dysentery), rosellosis,
Cholera, Shigella, Salmonella, campylobacter, yersinia,
Escherichia, clostridium, Staphylococcus

← هذه الأنواع تنتج GIT infections
← تتسم أغلبهم manifested by diarrhea

← Dehydration: فقد كمية كبيرة من الماء تؤدي إلى أعراض تتراوح ما بين
mild to moderate

- يبدأ بالشعور
بدوخة وإرهاق
رعشة ناشف
رغبة بالماء (عطشان)
جفاف الحلق

تتطور إلى → Shock نتيجة severe diarrhea خصوصاً عند الأطفال → عندما يؤدي death

← أشهر سبب لل dehydration ← Diarrhea
هناك أسباب أخرى لل dehydration
↳ bleeding, burning and vomiting

⇒ How to treat different GI infections or
Aims of treatment diarrhoea.

[1] To correct the water, electrolyte deficient.
← شرب ملو البطاطا أو الأرز أو فول الصويا بعد غليهم (أفضل أنواع ORS)
[2] To prevent dehydration
[3] Reduce mortality

⇒ Treatment
① ORS : Oral Rehydration Solution
- It's the best treatment and correction of GI infection
ليش؟؟ خصوصاً في الأطفال
The most GIT is a viral in origin or parasitic in origin and self-limited by immune system.
← 3 أو 4 أيام بيشفى (بطيب) الطفل ولكن المشكلة الكبيرة بتكون
صارح بـ dehydration (الحل)
- Correct to hydration by ORS
بيساعد immune system ← بتخلص من الـ virus
وبرجع الوضع طبيعي.

- ORS in pharmacy
- Melyte®
- Orset® D
- Fuca® "hydralax"
- Electro sap®
- Aqua mix®

ORS : يحتوي على NaCl ، KCL ، glucose

لم أسهل وأرجع وأخرج حلويه لمعالجة الناتج diarrhea

منها dehydration

مكونات ORS : (1) Salts + (2) Other subs. + (3) Electrolyte

- Salts
  - NaCl
  - KCl
- Other subs.
  - glucose
  - sucrose

← ORS يؤخذ عن طريق الفم

في الحالات الصعبة (IV)

⇒ glucose base ORS (glucose base type)

- reversing of dehydration (correction)

But has disadvantages

- not affect duration of diarrhea
- " " stool volume

⇒ rice base ORS

- provide more calories than the glucose based.
- culturally acceptable.
- reduces stool volume (by about 40 percent).
- Shortens the duration of diarrhea in both cholera and other severe diarrheal diseases.
- reduce diarrhea by adding more substrate to the gut lumen without increasing osmolality, thus providing additional glucose molecules for glucose-mediated absorption

- Cost effective (IV vs Oral)
- Lack of complications

Soya , rice إضافة مواد مثل diarrhea لعلاج ←

Advantages of ORS	Disadvantages of ORS
- More physiological. - Easy to administer. - Cost effective. - Home equivalents available. - Free of cost at PHC, subcenters. - Readily available and needs no sterilization.	- Ineffective when, ↳ Stool purge is high (>5 mL/kg/hr) ↳ persistent vomiting ↳ in correct preparation / administration ↳ Abdominal distension and Ileus ↳ Glucose malabsorption cases. glucose free عشان - Most importantly, ORS doesn't reduce severity/ duration of diarrhea.

→ G/I infection علاج ←

① Correct the dehydration
② prevent dehydration
③ ↓ duration, ↓ volum, ↓ frequency } the first ttt

② Antimotility Agents = (Antidiarrheal drugs)

→ Agents that inhibit peristalsis such as
① Diphenoxylate } ⇒ morphine like substance
② Loperamide,

Contraindicated in most toxin-mediated diarrheal illnesses (enterohemorrhagic E.coli, pseudomembranous colitis, and Shigellosis)

→ Slowing of fecal transit time is thought to result in extended toxin-associated damage.

→ On the other hand, in travelers diarrhea
Combination of appropriate ① Antibiotics } control
② Loperamide } symptom

← زمان، كانوا يستخدموا مجنة الأفيون و
morphine like drugs then Chemically synthesis
↳ Diphenoxylate
↳ Loperamide

morphine like substance affect on Mu receptor in GIT, not affect on Mu receptor in brain

← Selectivity الي في GIT، شوي في brain
في الجرعات الكبيرة
الجرعة العادية تؤثر في
- GIT plexus and ↓ motility and ↓ diarrhea

→ S.E of morphine: Constipation

→ S.E of atropine like drugs : Constipation
and its derivative

↳ Scobutyl
↳ Scopolamine
↳ propantheline
↳ mebeverine → Colotal®
↳ Novitropan®

← حقنة atropine ← في العضل أو تحت الجلد

⇒ Morphine-like drugs , Atropine-like drugs → ↓ motility and ↓ secretion and ↓ diarrhea and correct dehydration

← حاولوا نخلط معاها مستحضرات adsorbant agents
↳ Choline , pectin

عشان تقلل الماء ← ↓ diarrhea

⇒ Antimotility agent = Antidiarrheal agent
Contraindicated in toxigenic types induce diarrhea
(الإسهال المسبب بالبكتيريا التي تعمل toxin)

↳ E.Coli , Vibrio Cholera
↳ Colistridium difficile
↳ pseudomembranous Colitis

← إذا الطفل عنده إسهال وسخونة شديدة إذن toxigenic

toxigenic type induce diarrhea ما تستعجل في علاج (خليه ينظف) بإعطاؤه سوائل فقط (ORS)
ما تستعجل بإعطاء الدواء لأنه الدواء هيلم toxins بـ toxigenic البكتيريا وتظل محتفظة بالإسهال الدواء هيوقف

(3) Antibiotics

Pathogen	1st_Line agent	Alternective agents
* Pathogen (1) Enterotoxigenic (Cholera_like) diarrhea (1) Vibrio Cholera G⊖ bacilli	+++ or prophylactic [1] Doxycycline 300mg Oral, single dose. [2] Tetracycline 500mg orally, 4 times daily X3days [3] Co-trimazole DS tab. (800 mg + 160mg) twice daily X 3 days [4] Ciprofloxacin 500mg orally, twice daily X 3days or 1g orally single dose.	[1] Chloramphenicol 50mg/kg IV every 6 hours [2] Erythromycin 250-500 mg PO every 6-8 hours [3] Furazolidone.

الأعراض
. إذا كان سبب diarrhea ← vibrio Cholera
↳ (1) severe diarrhea
↳ (2) foul odor رائحة سيئة جداً
↳ (3) fever
↳ (4) fatigue and malaise
(5) لا ظهور بقع زرقاء بالجسم

→ Diagnosis of Cholera by microscope

Pathogen	1st_Line agents	Alternative agents
Enterotoxigenic (2) E. Coli	Ciprofloxacin 500mg orally twice daily X 3 days	Co-trimazole DS tab every 12 hours
(3) C. difficle	Metronidazole 250 mg 4 times daily X 10 days Metronidazole 500 mg 3 times daily X 10 days	Vancomycin 125 mg orally; Less absorbable 4 times daily X 10 days

Antibiotics + ORS ⟸ Enterotoxigenic diarrhea علاج ⟸
Only

antimotility agents ممنوع نعطي

Pathogen (2)		
Invasive (Dysentery-like) diarrhea (1) Shigella specie ⟹ invasion in intestinal layers	Co-trimoxazole DS tab. twice daily X 3-5 days.	[1] Fluoroquinolones: ofloxacin 300 mg or ciprofloxacin 500 mg twice daily X 3 days [2] Azithromycin 500mg orally X 1 day then 250mg orally daily X 4 days

dysentery, spasm الحزق
يعني إسهال مع تعنا يه
(شعور بالمغص) ليش؟
لأنو البكتيريا عملت invasive to mucus membrane
musculature
GP إفرازات فيها blood, mucus مع stool

(2)

Salmonella

↳ Nontyphoidal

[1] Co-trimoxazole Dstab. twice daily

[2] Ofloxacin 300 mg or Ciprofloxacin 500 mg twice daily X 5 days

[3] Ceftriaxone 2g IV daily

[4] Cefotaxime 2g IV 3 times daily X 5 days

Azithromycin 1000 mg orally X 1 day followed by 500 mg orally once daily X 6 days

Salmonella

↳ typhoid

Enteric fever

[1] Ciprofloxacin 500 mg orally twice daily X 3-14 days

[2] Ofloxacin and pefloxacin equally efficacious

[1] Azithromycin 1000 mg orally X 1 day followed by 500 mg daily X 5 days

[2] 3rd gene. cephalosporin Cefixime, cefotaxime and ceftriaxone

[3] Chloramphenicol 500 mg
- 4 times daily orally
- IV X 14 day

[4] Doxycycline

Salmonella typhoid
(Enteric fever) ← هنلاحظ وجود sensitivity في علاجها

بس كتير ناس بتقيس titres of O and H antigen ⇐ 1/160 ↑ أو فوق ← +ve
typhoid يعني عنده ←
← أخد العلاج لمدة ١٠ أيام وبعدها عمل تحليل
ومش تغيير نوع الدوا مش فعال (أخد ciprofloxacin)

← بنعطيه Ciprofloxacin + Doxycycline (إذا ما استجاب)

← بنعطيه Chloramphenicol (ما استجاب)

← بنعطيه IV cefotriaxon

drug of choice : Ciprofloxacin

Invasive

(3) Campylobacter

Macrolides

[1] Erythromycin 500mg ← not available
Orally twice daily X 5 days

S.E:
(1) gastric irritation, (2) GIT troubles بعمل
(3) Vomiting, (4) nausea
(5) enzyme inhibitor

[2] Azithromycin 1000
Orally x 1 day
followed by 500 mg daily x 5 days

[3] Clarithromycin 500 mg
Orally twice daily x 5 days

Ciprofloxacin 500 mg
Orally twice daily X 5 days

• مثلاً في علاج Toxoplasmosis نستخدم أفضل دواء spiramycin → Rifamycin (2)
لكنه غير متوفر بالأسواق لذلك بندور عن بدائل

---

(4) yersinia species

highly resistant type
مزعجة جداً
تحدث نوع من أنواع الإسهال يستمر لفترة طويلة
ويصاحب أعراض مغص، إسهال، ترجيع، إرهاق.

Combination therapy

- (1) Doxycycline
- (2) Aminoglycoside
- (3) Co-trimoxazole or fluoroquinolone

يستمر بالعلاج أقل شي 5 أيام

Pathogen ③

Traveler's Diarrhea

↳ Prophylaxis

[1] Ciprofloxacin 500 mg
Orally daily
(in asia, africa, South america)

[2] Co-trimoxazole DS tab.
Orally daily
(in mexico)

↳ Treatment

[1] Ciprofloxacin 500 mg
orally twice daily X 3 days

[2] Co-trimoxazole DS tab.
Orally twice daily X 3 days
(in resistant type) ↓

[3] Azithromycin 500 mg
orally once daily X 3 days
(only in areas of high prevalence of quinolone-resistant Campylobacter species)

إذا المريض ما استجاب بنعطيه Azithromycin لأنه غالبا بكون سبب الإسهال Campylobacter

---

* ليش السفر بيسبب diarrhea

① Claimming changes
② Immune system disturbance (stress)
③ Diet habit changes
④ water change

* Clinical applications of different bacterial infections *

[D] Urinary tract infections

⇒ Cystitis
⇒ Pyelonephritis
⇒ Prostatitis

← زمان ... حالات في أطفال يعاني من UTI، أما الآن كتير في
أطفال اللي تعاني من UTI، ليش؟
بسبب diet أندومي وشيبسي (زفت وليمون ^^)

→ urinary system is healthy by different mechanisms
ربانيّ = خلق الإنسان في أحسن تقويم

- Normal kidney
- Normal ureter
- Normal bladder
- Normal urethra

↓ من أعلى إلى أسفل مع الجاذبية الأرضية لذلك خروج الماء بلون قوي جداً في الحالة الطبيعية

then normal sterilization of urinary tract by different mechanisms.

- normal PH (acid)
- normal opsonization ↓

Phagocyte, (بوابة) هجوم على البكتيريا
Macrophage, Chemotaxin, cytokine and Immunoglobulin.

→ pH acidic ↓
ضعيفة أكثر؟!!
normal flora → acidity pH
Lactic acid الأنفا بتطلع

normal physiology of urinary tract ← من هادي العوامل بتسبب

- The most causes UTI are bacterial, Less incidence viral and other organisms.
(rarely may be due to viral, fungal infection)
- The most type of bacteria that cause UTI is E. Coli
① Flouroquinolone ← نعطي هيك نوعين
↳ ciprofloxacin
or
② aminoglycoside
③ co-trimoxazole

⇒ Common causative organisms:
[1] E.coli : bacterial infection of urinary tract.
(cause most community acquired infection 80_85%)

[2] Staphylococcus saprophyticus 5-10%

[3] UTI associated by G⊖ bacteria
proteus, klebsiella, psudomonal, Enterbacter,

⇒ Normal mechanism that maintai sterility of urine.

① Free-flow kidney through urinary

② Complete bladder empting
"Good evacuation"

③ Adequate urine volume ⇒ اشرب كمية كبيرة من الماء عشان تغسل UT بها.

④ Normal acidity of urine → اشرب عصير ليمون

⑤ peristaltic activity of ureters.

← ممنوع احتباس البول، يجب تفريغ البول من المثانة تماماً. ليه؟
due to urine is a good media of multiplication of bacteria and growth of microorganism.

← ٦ حاجات تنظفها قبل النوم ؟؟

① نظف العقلون
② نظف المثانة
③ نظف الأعشاب
④ نظف قلبك .... وتم ؟؟

*Pathophysiology

⇒ Pathophysiology which have Colonized urethra, vagina or perineal area enter urinary tract by ascending mucus membrane & perineal area into Lower UTI

⇒ Bacteria can ascend from bladder to infect the kidney.

⇒ Classification infection

- Lower urinary tract infection
  - ⇒ urethritis
  - ⇒ Prostatitis
  - ⇒ Cystitis
- Upper urinary tract infection
  - ⇒ inflammation of kidney.
  - ⇒ renal pelvis.

Pathophysiology

[1] Contamination of periurethral area w uropathogenic E. Coli that has Colonized the bowel.

[2] Adherence to uroepithelial cells by type 1 and P. fimbriae.

[3] Invasion, intracellular multiplication observed for selected strains.

[4] Apoptosis and exfoliation of bladder epithelial cells.

[5] Influx of PMNS ⇒ Polymorphonuclear neutrophils

[6] Type 1 fimbriated E. Coli selected at high CFU (Colony forming unit) and Low O_2

[7] E. Coli ascends to kidney.

[8] P. fimbriae bind to renal tubular epithelial cells
[9] Cytokines induced
[10] Haemolysin damages epithelium
[11] Sat vacuolates epithelial cell and damages glomeruli.
[12] E. Coli crosses tubular epithelial cell barrier to initiate bacteraemia. (kidney)

→ inflammation of urethra Urethritis

→ inflammation of bladder cystitis
له النساء أكثر عرضة من الرجال .

→ inflammation of ureter ureteritis

→ inflammation of kidney Glomerulitis
Glomerulonephritis

⇒ Lower urinary tract infection "non-complicated"
vaginaitis, Cystitis, Urethritis and ureteritis
له علاجهم عصيريون ، 2-3 أيام

⇒ Upper urinary tract infection "Complicated"
Glomerulonephritis

⇒ Risk Factors

① Aging
- → ↑ incidence of DM
- → ↑ risk of urinary stasis ركود البول
- → impaired immune response

② Male

③ Impaired bladder innervation.

اتصال مباشر بين urinary bladder و Autonomic nervous system / CNS
سواء في وقت النوم أو اليقظة.

Neurogenic bladder
- عدم التحكم في المثانة بسبب مشكلة بالدماغ
- فقدان اتصال مباشر بين bladder و CNS
- علاج / Encytol® ... , Uripan®

(لم نستخدم إذا كان في خلل ب bladder sphincter)

④ Female ⇒ ① short urethra,
② use of contraceptive that alter the normal flora of vagina.

⑤ Staying still (immobile) for long period of time.

⑥ Constipation

Lower urinary tract infections

محاضرة (9)

①

⇒ General Symptom of Cystitis (Lower urinary tract infection)

1. Dysuria as frequency
2. Nocturia
3. Urgency and frequency
4. Suprapubic pain and tenderness
5. Urine ω bad odor, Cloudy Bloody
6. abdominal pain

* The most important one ⇒ cystitis → in male → أقل / and in female → أكثر

(ureteritis ، urethritis) ← أما الباقي قليلة الحدوث

* cystitis تكثر عند female وخصوصاً في فترة الزواج (18 – 50 yrs)

② Urethritis

⇒ infection in urethral "tubes from kidney to bladder become infected"

⇒ more common in female; because the opening of urethra is close to anus (compared to male), making easier to GI bacterial to infect urethra.

المحاضرة 8.

③ Vaginitis

→ Infections vaginal account 90% of all cases in reprodctive age women and is represented by triad:-

⇒ Candidiasis "fungal" vaginitis caused by Candida albicans "yeast"

⇒ Bacterial Vaginosis vaginitis caused by Gardnerella

⇒ Other less common infection are caused by

Gonorrhea Chlamydia mycoplasma

⇒ Protozoal vaginitis

the most important one (infemale) by

Trichomonas vaginalis ⇒ Anaerobic

* الأعراض: ① إفرازات مهبلية كثيرة ذو رائحة سيئة

② irritation ③ itching in the vagina

(4) Prostatitis ⇒ in males

→ inflammation of prostate gland behind bladder in the front of rectum.

→ Classified to:
- ↳ acute , Chronic
- ↳ asymptomatic inflammatory prostatitis
- ↳ Chronic pelvic pain Syndrom.

→ The primary symptom of Chronic infectious prostatitis is usually repeated bladder infections

→ prostatitis is considered Chronic if it lasts more than 3 months.

← أعراضها تشابه أعراض Cystitis /

1. آلام تحت المثانة
2. حرقان في البول
3. تقطيع في البول

← علشان تتطور prostatitis ⟵ ل → benign prostate hypertrophy (BPH)

⇒ Prostatitis symptoms vary depending on the cause
They may includes :

① Pain or burning sensation when urinating
Dysuria

② Frequent urination, particularly at night
Nocturia

③ Difficulty urinating, such as dribbling or hesitant urination.

④ Urget need to urinate Pain in the abdomen, groin or lower back.

⑤ Pain in the area b/w the Scrotum and rectum
Perineum

⑥ Pain or discomfort of the penis or testicles

⑦ Painful orgasms **ejaculations**

⑧ Flu-like symptoms (w bacterial prostatitis)

Upper urinary tract infections "Complicated"

↳ in affect 2 kidneys and caused Pyelonephritis

إذا لم تعالج ، ممكن يتطور الى

Pyelonephritis ⟶ glomuronephritis ⟶ Chronic pyelonephritis

→ End Stage: Renal failure

Pyelonephritis (Acute)

→ Inflammation of renal pelvis and parenchym. functional kidney tissue

→ has 2 types

↳ Acute Pyelonephritis

↳ Chronic Pyelonephritis

→ Result from an infection that ascend to kidney from lower UTI.

(because it's not treated or fail treated.

⇒ Risk Factors

① pregnancy
② Renal calculi
③ UT obstruction and Congenital malformation
④ Poly Cystic or hypertension renal disease
⑤ Chronic disease (DM)
⑥ UT tramua, Scarring

⇒ General Symptom of upper urinary tract infection

① Chills and fever
② Malaise and fatigue
③ Vomiting and nausea
④ Flank pain → ألم في الخواصر
⑤ Dysuria, Urinary frequency

⇒ Pathophysiology

The main cause of Pyelonephritis

تنتقل ال infection من أسفل لأعلى

E.coli + G(−) bacterial
- ↳ pseudomonus
- ↳ klebsiella
- ↳ proteus

Chronic pyelonephritis

→ involves chronic inflammation and scarring of tubules and interstitial tissue of kidney.

→ Common cause of Chronic renal failure

→ May be develop from chronic hypertension, Vascular condition, Obstruction of urinary tract.

← التغيرات التي تحدث عن الكلية ليس فقط في
Physiology or function or symptoms

إنما تشمل أيضاً Histopathological

---

* ماذا يحدث في الكلية المصابة بـ Chronic pyelonephritis ؟!

1. Scar
2. Changes in the shape
3. " " " physiology
4. " " " function

---

*Complication of hypertension

1. renal	or	1. renal and retenal
2. Vascular		2. cardiac and vascular
3. eyes		3. eyes
4. Cardiac		4. brain

⇒ to prevent complication of hypertension

AECI and ARBs and B-blocker

⇐ لما الجسم ما يقدر يتحكم بـ BP ، يبدأ الجسم يتعوض ويعمل remodeling → Cardiac ⇝ Cardiac hypertrophy → nonfunctional
→ Vascular ⇝ angiogenesis

نقدر ← B-blockers ، ARBs ، AECI

to prevent heart disease

B-blocker (↳ Cardiac arrest
↳ angina
↳ Myocardial infraction

Asymptomatic bacteruria

→ Significant no. of bacteria in urine that occur without usual symptom such as burning during urination.

→ Person who have urinary catheters often will have bacteriuria but most will not have symptom.

→ In case of children and pregnant women need ideal dose of therapy

← التحليل يبين أن الشخص مريض ، ونسبة WBCs < 10^5 ml في البول
لكن الشخص لا يشعر بأي أعراض ، السبب asymptomatic أو المريض مركب Catheters

← يعني يوجد infection لكن ما في أعراض

Symptomatic a bacteruria

→ Some ptn. have symptom such as urgency, dysuria, pyuria and these symptom is similar to symptom of lower UTI but in urine analysis appear that bacteria less than 10^5 mL.

→ Can be treated by single dose of antibiotic.

Recurrent UTI

→ presenting as dysuria most commonly caused by reinfection ب original bacterial isolate in young

→ Frequency and sexual intercourse is strongest predicator of recurrent UTI in ptn. presenting ب recurrent dysuria.

← مثلاً تعالج الزوج و الزوجة لم تعالج بالتالي سيرجع المرض بينهم ، لذلك يجب معالجة الزوجين معاً

→ E. Coli is most common organism in all ptn. group.

Diagnostic test

[1] Urinalysis

→ Done for RBC, WBC, bacteria and for certain chemical such nitrites in urine

nitrate → nitrite

if ↑WBC , ↓RBC → infection

if ↑RBC → infection ⇝ stones

[2] Culture - Sensitivity test

→ May be done to identify the type of bacteria in urine and select the best antibiotic

[3] CBC and blood culture may be done

other test can be done include :-

1. CT scan of abdomen
2. Intravenous pyelogram (IVP)
3. kidney scan
4. kidney ultrasonal

*Goal of treatment

1. Eliminate causative agent
2. Prevent relapse or recurrence
3. prevent complication
4. Relief symptoms

* Medications *

⇒ 2 regimens

Short course therapy	Long course therapy
→ For uncomplicated lower UTI	→ For complicated upper UTI

⇐ لكن زمان واستمر لفترة طويلة
Short course one day and one dose

⇒ injection: Ceftriaxone or gentamicin 160

⇒ tab.: Ciprocare SR or ciprocare 500

⇐ لكن حالياً بسبب resistant
↓
Short course for 3 days

⇒ Hospitalization
⇒ IV antibiotics for 2 weeks

← المريض بكون تحت مظلة
↓
Culture sensitivity
لتحديد المضاد الحيوي المناسب.

← فلن نعطي broad spectrum antibiotics
↳ as empiric
لغاية ما تيجي culture ونعطي المضاد الحيوي المناسب لمدة ١٤ يوم ع الأقل.

⇒ Short course therapy

Surely for uncomplicated Lower UTI

- ↳ cystitis
- ↳ urethritis
- ↳ asymptomatic bacteruria
- ↳ Symptomatic a bacteruria

} عدد علاج 3 days

⇒ Ideal course therapy

- 10 – 14 days (2 weeks) therapy for Complicated (Upper UTI)
  - ↳ Pyelonephritis
  - ↳ Stone

→ history of previous infection
→ antibiotic resistance infect
→ severe illness

} ⇒ may be hospitalization and IV antibiotics

* ليش بنعطي IV antibiotics ⟵

! pyelonephritis ← Complicated حالة

الحالة, nausea and vomiting زي من أعراض الحرجة

emergency, severe

dangerous و resistant يوجب

* Medications

Antibiotics

Commonly used for short, long course therapy include:

1. Co-trimoxazole sulprim®
2. Flowroquinolone → ciprofloxacine (Ciprocare®) Taricin®, Moxiflox®, Levox®

IV antibiotic

1. Ciprofloxacine
2. gentamycin
3. ceftriaxone

فعال ضد G(-) bacteria

---

* Nursing Care *

1. Fluid intake (2 - 2.5) L/daily (for normal people) → for Ideal
   - لو شخص وزنه زايد فلنقول 150 kg → بالتالي النسبة بتزيد 4L/daily
   - لو شخص عنده حصوات الكلى يشرب 5L/daily
2. Drink cranberry juice or use Cranberry tablet
   عصير ليمون، vitamin C
3. Don't drink fluid that irritate the bladder such caffeine
4. Empty bladder every (3-4 hr)

Clinical applications of different bacterial infections

E Sexually transmitted diseases

⇒ Syphillis
⇒ Gonorrhea
} ⇒ Venereal diseases

Sexually transmitted diseases →
لم تعتبر من ملحقات ← UTI أو من ملحقات الأمراض الجلدية
ليش؟
• لأنه أكثر أعراض الأمراض المنتقلة
هي أعراض جلدية.

Venereal Diseases

Syphilis مرض الزهري

⇒ Syphilis is a sexually transmitted infection caused by bacterium ← Treponema pallidum ← بكتيريا حلزونية جداً

⇒ Syphilis is acquired by sexual intercourse
← أول ما يصاب الشخص وينتقل المرض (تنتقل البكتيريا من شخص مصاب إلى شخص سليم (تنتقل بين الأزواج)) وتبدأ ظهور أعراض
① (أعراض جلدية) Cutaneous Lesions
② Characteristic Lesions ← Chancre
(عبارة عن قرحة دائرية في الجهاز التناسلي عند الرجل أو المرأة)

⇐ يمر مريض Syphilis بـ 4 مراحل :

1. primary
2. secondary
3. tertiary
4. Latent

1 Primary Stage

→ person usually has just a single Chancre : a firm, painless, non-itchy skin ulceration or wound.

← إذا تم معالجتها ← بتروح عن طول

→ If untreated after one month (or 1–8 weeks) healed Spontaneously

← إذا لم تعالج خلال شهر بتروح من تلقاء نفسها لكن الجهاز المناعة يتغلب عليها ، لكن بعض الجسم بتطور

2 Secondary Stage

→ person usually gets a rash, which usually appears on the palm of the hands and the Soles of the feet.

→ secondary stage of Syphilis is characterized by variety of mucocutaneous eruptions.

(3) microorganism ← rash بتنتشر لكل الجسم نتيجة انتشار Lymphatic tissue أنسجة

→ if untreated second syphilis → healed spontaneously

← من 4 إلى 10 أسابيع (تقريباً من شهر إلى شهرين) ← lesion بتروح

← لكن المرض لسا موجود بالجسم

3 Latent Syphilis

← بضل المرض حوالي من 3 إلى 4 سنوات بدون أعراض لكن ← Sero positive

→ By definition person ω positive serological test for Syphili but without any symptoms.

← في هذه المرحلة المريض ينقل العدوى لكن لا يوجد أعراض

→ most untreated ptn. ω Late Latent syphilis have no further consequences, however, approximately 25% to 30% progress either to neurosyphilis or to Late syphilis ω Clinical manifestations other than neurosyphilis

→ يتطور المرض / خصوصاً عند الناس اللي مناعتهم ضعيفة

4 Tertiary syphilis and Neurosyphilis

→ These can include problems ω

① nervous system (brain and nerves)
② heart

* neurosyphilis ← تبدأ في حالة اسمها "جوتا أو جوما"

يبدأ المريض بـ → inflammation of nervous systems ← "طريقة العلاج تختلف من شخص لآخر"

↳ different symptoms in CNS → neurosyphilis ??

① imbalance ② tremors ③ amnesia

← المريض ينسى ولم يتذكر حاجة

* Diagnosis of Syphilis
- Blood tests

* Treatment of Syphilis
→ Syphilis that is not complicated can usually be treated and cured by antibiotics medications

→ 1st ttt that is used is either
Single dose of penicillin G, IM or ceftriaxone
or
Single dose of oral azithromycin

⇐ إذا المريض عنده حساسية من penicillins

→ Alternative therapy
- Doxycycline and tetracycline ← عشان الحامل
- 3rd generation of cephalosporins ← good ttt
↳ ceftriaxone

→ Antibiotic resistance has developed to a no. of agents
- Macrolides
- Clindamycin
- rifampin

⇒ Once syphilis progresses into Late stages of disease
Ex: neurosyphilis → pass CNS

- penicillin G doesn't travel into CNS.
- Single short of penicillin G → cure early syphilis
  → not cure neurosyphilis

Treatment

→ long course of penicillin
Large doses of penicillin for at Least 10 days, IV

⇐ إذا المريض عنده حساسية من penicillins
⇐ بطّلو بستخدموا penicillin لأنه ما بروّح CNS كتير

→ 3rd generation of cephalosporin
  ↳ cefotaxime
  ↳ cefixime
  ↳ ceftriaxone
  ↳ ceftazidime
  ⇒ good pentration of brain

→ Doxycycline and tetracycline

But they have to be given over Longer periods of time.

Venereal Diseases

* Gonorrhea * مرض السيلان → in male / → in female

⇒ Sexually transmitted disease of bacterial origin for male and female.

⇒ Etiologic agent: G(−) cocci
Neisseria gonorrhea

← أكثر ناس عرضة للإصابة بهذا المرض: سن التزاوج 15–27 yrs

← تعيش هذه البكتيريا في مناطق weted area
↳ in the weted mucus membrane in the male and female.

⇒ When infected person contact, example: sexualintercourse by healthy one.

ينتقل المرض من شخص إلى آخر: تستمر فترة الحضانة ↓

⇒ Incubation period: 2–7 days

وبعدها تبدأ تظهر أعراض عند المريض ↓

Character of symptoms

Genital	Extragenital
"genitourinary"	⇒ Pharyngitis
	⇒ Arthritis

* Genital infection in Men

[1] Urethritis ← الشخص المصاب، أول ما يبدأ بالأعراض يبدأ بـ
and purulent discharge يعني yellowish-green mucus
تظهر في الرجال والنساء المصابين ووضوحًا عند الرجال أكثر
← النساء المصابين ← asymptomatic.

[2] Epididymitis : inflammation of epididymis
→ Enlarged and pain in scrotum.

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*Genital infection in female
⇒ Most infections are asymptomatic

[1] Cervicitis : inflammation of the cervix (عنق الرحم)
purulent discharge ⇝ green-yellow discharge
and cervical pain ألم عنق الرحم and bleeding
لم يكن موجودًا في

① sexual intercourse
② examination

[2] Urethritis : inflammation of the urethra.

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* Disseminated symptoms (Complications) أعراض منتشرة in female

[3] pelvic inflammatory syndrome
↳ its symptoms / pain ①, fever ②, abdominal pain ③,
dyspareunia ④, painful and abnormal ⑤
bleeding during menstruation;
Bartholinitis ⑥ ⇝ pain, edema and discharge of labia
of the vagina.

[2] Accessory gland infection
[3] Fitz-Hugh-Curtis syndrome
[4] Perihepatitis.

* Extragenital manifestation of gonorrhea

[1] pharyngitis

[2] proctitis → inflammation of rectum

← يخرج خُراج من الanus مع خروج دم و سوء في rectum

→ purulant discharge: Anorectal discharge and bleeding

لم علّة الأطباء يشكوا في حالة cancer ، بالتالي يوصفوا antibiotic as examination

لم الأطباء يوصفوا حقنة واحدة من ceftriaxone ، إذا المريض تعافى بعد 5 أيام

إذن الحالة gonorrhea وليس cancer .

[3] Arthritis or Polyarthritis

[4] Tenosynovitis : inflammation of synovial membrane and tendons

[5] Dermatitis

[6] Conjunctivitis

[7] Disseminated gonorrhea infection (DGI) →
- sepsis ω endocarditis
- meningitis
- osteomyelitis
- Pneumonia.

← علّة خفيف يكون عندو أعراض genital لكن مش أعراض extragenital وهذا العكس .

⇒ Other manifestations of gonorrhea.

In man

- Hymenal and tubal synechiae, tubal motility disorders → infertility

In neonates

- Gonorreal conjunctivitis ~ see nesserial conjunctivitis

العلاج / حقنة ceftriaxone

مرهم من tetracycline أو ما شابه لمدة يومين أو 3 أيام

* Diagnosis

⇒ Culture tests

1. Urine analysis
2. Swab specimen
3. Synovial fluid

⇒ Non-culture tests

⇒ Gram stain

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* Treatment of gonorrhea

⇒ 2 antibiotics

1. Cephalosporins → 3rd generation or 2nd generation
2. Fluoroquinolones

↳ Contraindication ب

① B-lactam allergy
② Children
③ pregnancy

⇒ Spectinomycin or Macrolides (tetracycline group)

⇒ pregnant women

① Cephalosporin

↓ B-lactam

② Spectinomycin

To prevent ophthalmia neonatorum

→ Genitourinary infections

عادة تحدث بسبب G(+) أو G(-) ، وغالبا G(-)

↳ E. Coli , Neisseria gonorrhea

but sometimes these cases are complicated by atypical bacteria

↳ Chlamydia Trachomatis (الأهم)

↳ Rickettsia

← بيصير G(−) + Atypical bacteria

← الطبيب أو الصيدلي ، عندما نعالج genitourinary infections

نعطي أدوية G(-) وما بيأثر بالمرة ع atypical bacteria

↳ Fluoroquinolones

↳ Cephalosporins

لما نيجي نختار ال

- Fluoroquinolone
- Cephalosporins
- Penicillins

← عشان هيك هنشوف روشتات مكتوب فيها

- Cefixime
- azithromycin

أو Azithromycin لحاله ، خوفا من وجود atypical bacteria

* Treatment

⇒ Uncomplicated gonorrhea

- 1st Line treatment: Single-dose ceftriaxone IM
  Single-dose azithromycin PO

- Alternatively: Single-dose cefixime PO
  Single-dose azithromycin PO

⇒ Complicated gonorrhea

- Single-dose ceftriaxone IM
- Doxycycline PO for 10-14 days

⇒ Disseminated gonococcal infection DGI

- ceftriaxone IM or IV
- single-dose azithromycin PO

→ if purulent joint(s) → drain

* Evaluate and treat the ptn sexual partners from the past 60 days.

→ sexual partners must be treated simultaneously to avoid reinfections.