



HEMATOPOIETIC & LYMPHATIC SYSTEM

SUBJECT : _____

LEC NO. : 5

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وَقُلْ رَبِّ زِدْنِي عِلْمًا

Yersinia and Rickettsia

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Hematopoietic and Lymphoid system
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Objectives

- Describe the general characteristics, epidemiology, pathogenesis, clinical presentation and management of *Y. pestis*
- Describe the general characteristics, epidemiology, classification, pathogenesis, clinical presentation and management of Rickettsia

Yersinia and plague

الطاعون

General Characteristics

- The most important species is *Y. pestis* which cause plague ← اسم المرض ← اسم العائلة → species
- Gram-negative bacillus with a tendency toward pleomorphism → or rod
ممكن تغير شكلها جوا حسب الانسان
- Nonmotile
- Non-spore-forming
- It is a member of the Enterobacteriaceae family

تشمل *Salmonella* و *Shigella* و *E-coli* و *Y. Pestis*

← [بتدخل عن طريق و bacilli] الجماعز المضمين
← *Y. Pestis* ام طريق انتقالها مختلفات

* اغلب ال infection المي بتسمى ال HIS وبتروج

على الدم : Gram negative pacteria

Epidemiology

- ^{الطاعون} The term plague is often used generically to describe any explosive pandemic disease with high mortality ^{سريع الانتشار}
- Medically, it refers only to infection caused by *Y. pestis*
- *Y. pestis* was the cause of the most virulent epidemic plague of recorded human history, the Black Death of the Middle Ages
- Plague is a disease of rodents transmitted by the bite of rat ^{هي سبب الطاعون الحبي صبار بالعصور الوسطى.}
fleas (*Xenopsylla cheopis*) ^{المريض مستوطن بالقوارض (فيران) طريقته انتقال - rat fleas حشرة}
^{تنغذي على دم ال rats ودم الانسان وبالتالي تنتقل المرض ال-}
- It exists in two interrelated epidemiologic cycles:
 1. The sylvatic: endemic transmission among wild rodents
 2. The urban: when infected rodents enter a city
- Humans can enter the cycle from the bite of the flea in either environment. However, chances are greater in the urban setting

* ال rat ناقل للعديد من الامراض مثل الطاعون .

Epidemiology:

- The term plague is often used generically to describe any explosive pandemic disease with high mortality
- Medically, it refers only to infection caused by *Y.pestis*

بشكل عام لما نقول طاعون كلمة طاعون الناس اعتادو يحكوها لأي وباء الو معدل وفاة عالي
بس طبيًا بشكل دقيق الطاعون "أو الطاعون الأسود" هو المرض اللي صار من ورا *Y.pestis* وكان منتشر
بكثره بالعصور الوسطى

- *Y. pestis* was the cause of the most virulent epidemic plague of recorded human history, the Black Death of the Middle Ages

يعتقد انه تقريبا قضى على ثلث البشرية في ذلك الوقت

- Plague is a disease of rodents transmitted by the bite of rat fleas (*Xenopsylla cheopis*)
- It exists in two interrelated epidemiologic cycles:
 1. The sylvatic: endemic transmission among wild rodents

وهاي ال cycle هي السبب انه الطاعون ما زال موجود, بكميات قليلة ببعض ال rodent الموجودة بالغابات وبالصحرا

2. The urban: when infected rodents enter a city

- Humans can enter the cycle from the bite of the flea in either environment. However, chances are greater in the urban setting

ولما يوصلو ال rodents عالمدين ممكن بمرحلة معينة يصير عنا human to human transmission (الذخمن)



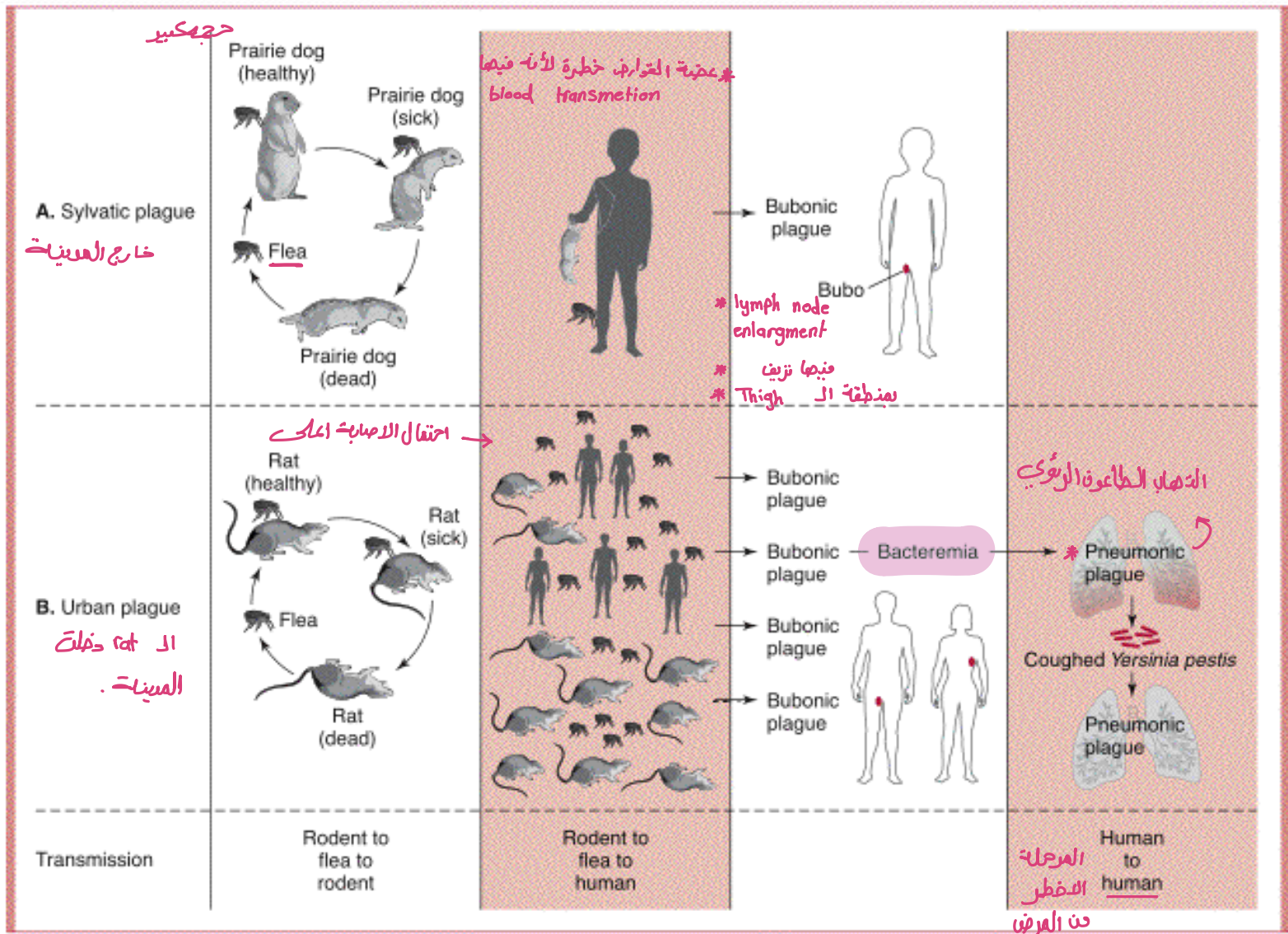
عذبة القوارض لما تتغذى على الدم Flea rat bite الشخص

● Transmission can be:

1. Flea to human infection: The bite of the flea is the first event in the development of a case of bubonic plague, which, even if serious enough to kill the patient, is not normally contagious to other humans
2. Human to human: Some patients with bubonic plague develop a secondary pneumonia by bacteremic spread to the lungs. This pneumonic plague is highly contagious person-to-person by the respiratory droplet route انتقاله سريع جدًا واحتمال الوفاة عالي

الاحتضار

The Epidemiology of Plague



Pathogenesis

rodent infected ← حبة rat flea تغذي على الدم المصاب فانتقلت لها البكتيريا

- The plague cycle begins when a rat flea feeds on a rodent infected with *Y. pestis*. Bacteria are taken with the blood meal and multiply in the infected flea. Some virulence factors such as the fibrinolysin and phospholipase are produced ^{Flea البكتيريا لما تدخل على الـ} ^{بتمبير تفرج مجموعة مواد تساعد على التكاش}
- Once injected past the skin barrier by the flea, *Y. pestis* produces a new set of virulence factors as it senses the change from the temperature and ionic environment of the new host ^{بتمنقل البكتيريا للرسن (البكتيريا بتعرف بهامان الانتقال عن طريق اختلاف درجة الحرارة)}
- The organisms eventually reach the regional lymph nodes, where they multiply rapidly and produce a hemorrhagic ^{نزيف} ^{2 PUS فوسا} ^{3 (tender) الالتهاب الليمفاوي} suppurative lymphadenitis known clinically as the bubo ^{thigh groin lymph node}
- Spread to the bloodstream quickly follows with toxicity due to lipopolysaccharide (LPS) endotoxin
- The bacteremia causes seeding of other organs, most notably the lungs, producing a necrotizing hemorrhagic pneumonia known as pneumonic plague ^{التصاب رئوي} ^{necrotizing و hemorrhagic} ^{↓ يدخل بـ Cynosis} ^{in lung}

Clinical Manifestations

- The incubation period for bubonic plague is 2 to 7 days after the flea bite
- Onset is marked by fever and the painful bubo, usually in the groin or, less often, in the axilla
- Without treatment, 50 to 75% of patients progress to bacteremia and die in Gram-negative septic shock within hours or days of development of the bubo
- About 5% of victims develop pneumonic plague with mucoid, then bloody sputum

حتى تبدأ الاعراض

اما ال pneumonic plague بدوها ساهمت لتظهر الاعراض ويمكن تقمصها على الشخص من صاي المرحلة

خطير جدا

* كيف نشخص المريض !! (اعراض بتساعد الطبيب يحكي انه هاي الحالة طاعوني)

١. hemorrhagic suppurative lymphadenitis

(lymph node متفحجة ، فيها الدم ، pus)

٢. الدم بال Cough

ليس بس 5 بزيمبيرلهم pneumonic plague !!

لانه المعظم من اول ما يوصله الدم ويعل

bacteremia بتوفس

انتقال البكتيريا من الـ rat للإنسان → Secondary
ثم يفرغ على الدم و الرئـة

human to human
(بمجرد عطوول على الرئـة أثناء العدوى عن طريق الـ cough)

Primary Pneumonic Plague

بتبليش الامراض

- Has a shorter incubation period (2 to 3 days)
- Begins with only fever, malaise, and a feeling of tightness in the chest
- Cough, production of sputum, dyspnea, and cyanosis develop later in the course
- Death on the second or third day of illness is common, and there are no survivors without specific therapy
- A terminal cyanosis seen with pneumonic plague is responsible for the term Black Death → الـ اطراف يهيس لونهم اسود و مجردين بتنقل للمناطق الاخرى
- Even today, plague pneumonia is almost always fatal if appropriate treatment is delayed more than a day from the onset



من مناقريج اثر

Diagnosis

* The diagnosis of a plague case isn't easy, causing the doctor to be confident through diagnosis in addition to a report to the MOH.

Diagnosis

- The appropriate specimens are bubo aspirate, blood, and sputum
 - * bubotic plague → through a lymphatic sample
 - * pneumonic plague → through a sputum sample

- The appropriate specimens are bubo aspirate, blood, and sputum
- Aspirates from the bubo typically reveal Gram-negative bacilli
- An immunofluorescence technique is available in public health laboratories for immediate identification of smears or cultures
- *Y. pestis* is readily isolated on the media used for other members of the Enterobacteriaceae (blood agar, MacConkey agar), although growth may require more than 24 hours of incubation

bacteremia

سريع ، اقل خطورة

* ما يستخدم ال culture الأنو

بدنا فحمي سريع حتى نقتل نعالج العريضة

* في احتمال انه ينتقل المرض للشخص الي بزم الجنت

Treatment

- Streptomycin is the treatment of choice for both bubonic and pneumonic plague. Tetracycline, chloramphenicol, and trimethoprim-sulfamethoxazole are alternatives
- Timely treatment reduces the mortality of bubonic plague below 10%. Of the 31 human cases of plague reported in the United States in 1984, 6 (19%) died

إذا بلش العلاج مباشرة
سبب انه العرض بعد موجود ، (موجود
بالدم المتقدما)

بمشوف مع مين احتمالاً العريض خلال ٣ ايام ونعطيهم Antibiotic

Prevention

- Urban plague has been prevented by rat control and general public health measures such as use of insecticides rat القمضاء على
- Sylvatic plague is virtually impossible to eliminate because of the size and dispersion of the multiple rodent reservoirs. Disease can be prevented by avoidance of sick or dead rodents and rabbits
- Eradication of fleas on domestic pets, which have been known to transport infected fleas from wild rodents to humans, is recommended in endemic areas
- The continued presence of fully virulent plague in its sylvatic cycle poses a risk of extension to the urban cycle and epidemic disease in the event of major disaster or social breakdown
- Chemoprophylaxis with tetracycline is recommended for those who have had close contact with pneumonic plague

مهم جدًا

** ركزوا باللاب على الـ bacteremia واسمها الريبكورد

في انواع بكتيريا تبطل bacteremia مش موجودة بالنظريه بس مخطوطة باللاب
فغادي هياي مطالبين فيها باللاب.

** الـ cases الي باللاب مهمه

لـ و على الاغلب اسئله امتحان

اللاب تكون على نفس النمط ورج يكون التركيز

على اللانواع الي الـ الدكتور حط عليها اسئله

Cases باللاب

** الاسئله رح تكون عبارة عن دوج اكثر من محافظه سوا.

** الـ Fever موجوده بكل infection بس كل مرضها
بختلف بخصائص الـ Fever ، قد يش يوم بتصل ، مستقر
ولا قدرجه.

** الـ Vector بكل مرضها وهو

Rickettsia

(*) مش مطلوبه بالامتحان

لهياي حذفه سلاياتها

اكثروا من قراءة القرآن بتدبير



ادعوا لأنفسكم وألحوا بالدعاء



تذكروا أن للصائم دعوة لا ترد

لا تنسوني من دعواتكم 🙏😊

صلاة التراويح والقيام



تسحروا فإن في السحور بركة



اكثروا من ذكر الله



الصدقة (بالمال / الكلمة الطيبة / الابتسامه)

