NCBI Bookshelf. A service of the National Library of Medicine, National Institutes of Health.

StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-.

Chancroid

Authors

Lisandro Irizarry; James Velasquez[1]; Anton A. Wray[2].

Affiliations

[1] Wyckoff Heights Medical Center
[2] Wyckoff Heights Medical Center

Last Update: December 14, 2020.

Introduction

Chancroid is an exceedingly rare sexually transmitted infection, both in the United States and globally. Understanding its true prevalence is made difficult by the lack of a readily available diagnostic testing and by its similar presentation to other more common causes of genital ulcer diseases.

Etiology

Haemophilus ducreyi is the causative organism in chancroid. It is a small gram-negative rod which requires special media, not easily available in most laboratories, to ensure its growth.

Epidemiology

Chancroid is extremely rare in the United States and other developed countries. Challenges to understanding its true global incidence are based on difficulties in isolating the causative agent and the limited diagnostic and surveillance modalities available to the clinician.

In the United States, only seven cases in six states were reported to the Center for Disease Control and Prevention (CDC) in 2016. The reported cases involved a spectrum of individuals including minorities, heterosexuals, prostitutes, and those who engage in their services. As chancroid is a genital ulcerative disease, its lesions are more readily apparent and therefore more commonly reported among men. Uncircumcised males tend to have a greater incidence than those individuals who are uncircumcised. The likelihood of transmitting the disease to an infected individual during a single sexual encounter has been noted to be 0.35. [1]

Chancroid also has been found to be a significant cofactor in the heterosexual acquisition and transmission of HIV disease. Genital ulcers may increase the risk of HIV infection as much as 50- to 300-fold per each unprotected encounter of vaginal intercourse. [2] This phenomenon occurs by increasing the infectiousness of and host susceptibility for HIV infection. Interruption of the mucosa in genital ulcer disease provides a portal of entry for HIV. This, combined with an increase and activation of HIV susceptible cells, allows for enhanced viral replication and the acquisition of HIV disease.

HIV disease, in turn, may alter the appearance and clinical course of chancroid. This may include an increase in the incubation period, multiple ulcerating lesions, delays in healing, and poor response to standard courses of antibiotics, or treatment failures. [3], [4]

Pathophysiology

It has been experimentally demonstrated that inoculation with one colony-forming unit of *Haemophilus ducreyi* results in papule formation in 50% of individuals. This increases to papule formation in 90% of individuals after inoculation with 100 cfu. [5] Gene clusters have been noted in *H. ducreyi* which encode for a cytolethal distending toxin similar to those found in invasive enteric bacteria such as *Campylobacter, Shigella, and Escherichia coli.* This toxin causes irreversible cell cycle death of epithelial cells and may lead to the development of the skin breakdown and subsequent ulcer development. [6]

Histopathology

H. ducreyi is a small, fastidious gram-negative rod which requires an enriched growth medium cultivated in a high humidity, CO2-enriched environment. On Gram stain, long strands of organisms are seen in a pattern often referred to as a "school of fish" or "railroad track" in appearance. One may use this pattern when interpreting clinical specimens, but its presence is inconsistent, and therefore, its absence should not be viewed as eliminating *H. ducreyi* as the causative agent.

History and Physical

Chancroid predominantly affects younger sexually active individuals in the 21 to 30-year-old age group. This group reflects a large proportion of career sex workers and the typical younger male population in developing countries which partake of their services. An asymptomatic carrier state has been noted among women potentially allowing for the unsuspected transmission of the disease. [7]

The incubation period is typically 4 to 10 days after experiencing a minor trauma or microabrasion during sex. Common sites of infection in men are the corona, prepuce, or glans of the penis. In women, common sites frequently noted are the labia, introitus, and perianal areas.

Typically, an erythematous papule develops at the site of inoculation which quickly becomes a pustule and subsequently develops into an extremely painful ulcer with soft irregular margins, often referred to as a "soft chancre." Multiple ulcers may be noted either as a result of multiple areas of microtrauma or as a result of direct contact between two adjacent areas resulting in "kissing ulcers." The ulcer typically has a friable base with yellow-gray exudate which easily bleeds when abraded and varies in size typically from 1 to 2 cm. Left untreated, the lesion spontaneously resolves within 1 to 3 months.

Tender, often unilateral, regional lymphadenopathy develops in approximately 50% of infected individuals. Approximately, 25% of these individuals within 1 to 2 weeks of the presenting papule will progress to manifest suppurative buboes which may spontaneously rupture. Left untreated, these suppurative regional lymph nodes may become superinfected, leading to deep tissue destruction and disfigurement of external genitalia.

Evaluation

The diagnosis of chancroid based on clinical findings is made challenging by its potential similarities to lesions associated with other more common causes of genital ulcer disease such as syphilis and herpes infections. Because of this confounding presentation, diagnostic testing for both syphilis and herpes should also be undertaken in these patients.

Gram stain of the exudate may show the typical "school of fish" findings of gram-negative rods, but the sensitivity and specificity of such testing have been found to be poor and unreliable. [8]

As such, the Centers for Disease Control and Prevention has put forward recommendations in consideration of a diagnosis of chancroid. A definitive diagnosis requires identification of *H. ducreyi* on special culture media. This culture media is neither widely or consistently available to general public health entities and when used, has a sensitivity of less than 80% when compared to PCR. [9] In addition to this challenge, there is no FDA approved PCR test available for the *H. ducreyi*, leaving individual laboratories with the task of developing their own CLIA verified PCR studies. [10]

Instead of laboratory diagnosis, a presumptive clinical diagnosis can be made if all of the following are present:

1. One or more painful genital ulcers.
2. Clinical findings, the appearance of genital ulcers, and any presenting regional lymphadenopathy are consistent with chancroid.
3. No evidence of *Treponema pallidum* infection by darkfield microscopy of the exudate or by a serologic test performed at least 7 days after the onset of ulcers.
4. A Herpes simplex virus PCR test or culture performed on the exudate is negative.

Treatment / Management

Untreated genital lesions associated with chancroid in individuals not seeking care will spontaneously resolve within 1 to 3 months. Untreated individuals run the risk of progressing to painful regional lymphadenitis and, in approximately 25% of cases, the development of suppurative buboes.

In the early 1990's, the World Health Organization (WHO), given the difficulties in identifying the causative agents in GUD recommended the implementation of syndromic management of these diseases. Fully implemented by 2000, this has led to a precipitous decline in chancroid leaving genital herpes simplex to be the leading cause of genital ulcer disease. [11]

Antibiotic treatment should be initiated for any individuals with either a confirmed or presumed diagnosis of chancroid. Consideration should be given to frequent co-infections, most often with either syphilis or herpes, and the potential need to initiate empiric treatment if there is any question regarding compliance in follow-up with diagnostic testing. In addition, the role played by chancroid as a co-factor in the transmission of HIV should trigger testing or treatment of known HIV positivity. [3]

The Centers for Disease Control and Prevention recommends the following antibiotic options:

- Azithromycin 1 gm, orally as a single dose or
- Ceftriaxone 250 mg, intramuscularly (IM) as a single dose or
- Erythromycin 500 mg, orally 3 times per day for 7 days or
- Ciprofloxacin 500 mg, orally twice a day for 3 days

Objective improvement in symptoms and findings should occur within one to 2 weeks of the initiation of antibiotics, although the response of the associated regional lymphadenitis may occur more slowly. Fluctuant lymphadenitis may require needle aspiration or incision and drainage to assist in their resolution.

Lack of improvement with appropriate antibiotics may be the result of incorrect initial diagnosis, coinfection with another STI or HIV, drug resistance, or non-compliance with multi-dose regimens.

Sexual partners should be treated if exposed within the preceding 10 days of symptom development. Reinfection is possible due to contact with the source individual without the use of barrier protection, although it has been experimentally demonstrated that initial treatment with single dose azithromycin may offer prophylactic protection for as long as 7 weeks after treatment. [12]

Differential Diagnosis

The differential diagnosis includes herpes simplex infection, the most common cause followed by syphilis, and then distant chancroid. Clinical differentiation is difficult and inaccurate and may be made additionally challenging by co-infection with HIV or superimposed bacterial infection. Consideration also should be given to granuloma inguinale in the appropriate endemic setting as well as lymphogranuloma venereum if inguinal lymphadenitis is noted. [13]

Prognosis

Prognosis is an expected full recovery with antibiotic treatment, although lesions will spontaneously resolve without treatment as previously noted. Lack of treatment puts the patient at risk of developing suppurative lymphadenitis. Non-response to treatment should trigger a further investigation as to the causative organism or the patient's compliance with the treatment regimen.

Complications

Complications associated with chancroid include the development of fistulous tracts secondary to suppurative lymphadenitis and the destruction of the deep tissues of the genitalia by either secondary or superinfection by anaerobes such as *Bacteroides* or *Fusobacterium*.

Deterrence and Patient Education

Patient education should be directed toward the use of barrier protection during intercourse, most effectively through the use of condoms. Patients should be advised as to the risk of re-infection and recommend their source contact for

antibiotic treatment.

Pearls and Other Issues

- Chancroid represents an increasingly small number of the total cases of genital ulcer disease.
- Chancroid is a difficult clinical diagnosis, and syndromic management should be the mainstay of treatment.
- Regional lymphadenopathy develops in approximately 50% of infections.
- Single dose antibiotic treatment is the preferred management approach.
- Genital ulcer disease has been found to be a significant co-factor in the transmission of HIV disease.

Enhancing Healthcare Team Outcomes

The management of chancroid is an interprofessional. The diagnosis can be difficult and does require a consult with infectious disease. The condition requires treatment with an antibiotic but all patients need workup for other STDs. Safe sex education is recommended for all patients. Once chancroid is treated, the outcomes are good.

Continuing Education / Review Questions

- Access free multiple choice questions on this topic.
- Earn continuing education credits (CME/CE) on this topic.
- Comment on this article.

References

1. Dada AJ, Ajayi AO, Diamondstone L, Quinn TC, Blattner WA, Biggar RJ. A serosurvey of Haemophilus ducreyi, syphilis, and herpes simplex virus type 2 and their association with human immunodeficiency virus among female sex workers in Lagos, Nigeria. Sex Transm Dis. 1998 May;25(5):237-42. [PubMed: 9587174]
2. Hayes RJ, Schulz KF, Plummer FA. The cofactor effect of genital ulcers on the per-exposure risk of HIV transmission in sub-Saharan Africa. J Trop Med Hyg. 1995 Feb;98(1):1-8. [PubMed: 7861474]
3. Mohammed TT, Olumide YM. Chancroid and human immunodeficiency virus infection--a review. Int J Dermatol. 2008 Jan;47(1):1-8. [PubMed: 18173591]
4. Galvin SR, Cohen MS. The role of sexually transmitted diseases in HIV transmission. Nat Rev Microbiol. 2004 Jan;2(1):33-42. [PubMed: 15035007]
5. Al-Tawfiq JA, Harezlak J, Katz BP, Spinola SM. Cumulative experience with Haemophilus ducreyi 35000 in the human model of experimental infection. Sex Transm Dis. 2000 Feb;27(2):111-4. [PubMed: 10676978]
6. Cope LD, Lumbley S, Latimer JL, Klesney-Tait J, Stevens MK, Johnson LS, Purven M, Munson RS, Lagergard T, Radolf JD, Hansen EJ. A diffusible cytotoxin of Haemophilus ducreyi. Proc Natl Acad Sci U S A. 1997 Apr 15;94(8):4056-61. [PMC free article: PMC20567] [PubMed: 9108104]
7. Hawkes S, West B, Wilson S, Whittle H, Mabey D. Asymptomatic carriage of Haemophilus ducreyi confirmed by the polymerase chain reaction. Genitourin Med. 1995 Aug;71(4):224-7. [PMC free article: PMC1195517] [PubMed: 7590712]
8. Alfa M. The laboratory diagnosis of Haemophilus ducreyi. Can J Infect Dis Med Microbiol. 2005 Jan;16(1):31-4. [PMC free article: PMC2095004] [PubMed: 18159525]
9. Lewis DA. Diagnostic tests for chancroid. Sex Transm Infect. 2000 Apr;76(2):137-41. [PMC free article: PMC1758295] [PubMed: 10858718]
10. Glatz M, Juricevic N, Altwegg M, Bruisten S, Komericki P, Lautenschlager S, Weber R, Bosshard PP. A multicenter prospective trial to asses a new real-time polymerase chain reaction for detection of Treponema pallidum, herpes simplex-1/2 and Haemophilus ducreyi in genital, anal and oropharyngeal ulcers. Clin Microbiol Infect. 2014 Dec;20(12):O1020-7. [PubMed: 24909546]
11. González-Beiras C, Marks M, Chen CY, Roberts S, Mitjà O. Epidemiology of Haemophilus ducreyi Infections. Emerg Infect Dis. 2016 Jan;22(1):1-8. [PMC free article: PMC4696685] [PubMed: 26694983]
12. Thornton AC, O'Mara EM, Sorensen SJ, Hiltke TJ, Fortney K, Katz B, Shoup RE, Hood AF, Spinola SM. Prevention of experimental Haemophilus ducreyi infection: a randomized, controlled clinical trial. J Infect Dis.

1998 Jun;177(6):1608-13. [PubMed: 9607840]

13. Lewis DA. Chancroid: clinical manifestations, diagnosis, and management. Sex Transm Infect. 2003 Feb;79(1):68-71. [PMC free article: PMC1744597] [PubMed: 12576620]

Copyright © 2020, StatPearls Publishing LLC.

This book is distributed under the terms of the Creative Commons Attribution 4.0 International License (http://creativecommons.org/licenses/by/4.0/), which permits use, duplication, adaptation, distribution, and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, a link is provided to the Creative Commons license, and any changes made are indicated.

Bookshelf ID: NBK513331 PMID: 30020703