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RESEARCH ARTICLE

CEFTRIAXONE-RESISTANT NEISSERIA GONORRHOEAE IN A YOUNG MALE: A CASE REPORT HIGHLIGHTING MANAGEMENT CHALLENGES IN SAUDI ARABIA

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Abstract

This case report presents a 23-year-old male who presented with dysuria and purulent brownish urethral discharge following unprotected sexual activity. Culture results confirmed infection with Neisseria gonorrhoeae, which exhibited ceftriaxone resistance, complicating the management. The patient was empirically treated with ceftriaxone and azithromycin; however, his failure to attend follow-up care raised concerns regarding the resolution of the infection and the potential for further transmission. The absence of documented ceftriaxone-resistant N. gonorrhoeae cases in Saudi Arabia underscores the significance of this case. The increasing prevalence of antibiotic-resistant N. gonorrhoeae strains highlights the need for routine culture and susceptibility testing in guiding treatment, as well as the importance of public health strategies to improve adherence to STI treatment and follow-up protocols.

Introduction:-

Gonorrhea, caused by the bacterium Neisseria gonorrhoeae, is one of the most common sexually transmitted infections (STIs) worldwide, with an estimated 82.4 million new cases reported globally in 2020 among individuals aged 15–49 years.[1] The increasing emergence of antibiotic-resistant N. gonorrhoeae strains has raised concerns, particularly with regard to ceftriaxone, a third-generation cephalosporin that has been the cornerstone of treatment. Ceftriaxone-resistant N. gonorrhoeae poses a significant public health threat as it reduces the effectiveness of one of the last-line treatments for this infection.[2]

The World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) have reported that over the years, N. gonorrhoeae has developed resistance to almost all antibiotics previously used to treat it, including sulfonamides, penicillin, tetracyclines, and fluoroquinolones.[3],[4] The spread of ceftriaxone-resistant strains is exacerbated by factors such as unprotected sexual activity, misuse of antibiotics, and limited access to healthcare.[5] For example, China has seen a tripling of ceftriaxone-resistant gonorrhea cases from 2.9% in 2017 to 8.1% in 2022.[6] In contrast, resistance rates in other countries, such as the United Kingdom (0.21%) and the United States (0.2%), remain lower.[5],[4] This variation underscores the need for global surveillance and coordinated public health efforts, including new treatment options and vaccine development, to combat this growing resistance.[3]

Case presentation

A 23-year-old male, medically free with no significant past medical history, presented to the clinic complaining of dysuria and purulent, brownish urethral discharge for four days. The patient reported recent unsafe sexual activity

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with an unknown partner, occurring multiple times without protection, with the last encounter taking place one week prior to his presentation. Upon further questioning, the patient revealed a history of similar urethral discharge two months ago, for which he received empirical treatment consisting of ceftriaxone 500 mg intramuscularly (IM) and azithromycin 1 gram orally (PO), administered as a single dose to cover for both Neisseria gonorrhoeae and Chlamydia trachomatis.

On examination, there was visible purulent brownish discharge from the urethra. There were no other remarkable findings on physical examination.

A series of blood tests and urethral discharge cultures were ordered. The patient's blood work revealed negative results for HIV, hepatitis B and C, syphilis, and hepatitis A. The patient was positive for HSV I/II IgG antibodies but negative for HSV I/II IgM, indicating a previous herpes simplex virus infection.

The culture of the urethral discharge revealed light growth of Neisseria gonorrhoeae, with susceptibility testing showing resistance to ceftriaxone and susceptibility to tetracycline and ciprofloxacin.

The patient was referred to the infection prevention and control department for further management and was started on empirical therapy with ceftriaxone 500 mg IM and azithromycin 1 gram PO, pending the results of the culture and susceptibility testing. Despite the recommended treatment and referral, the patient did not return for follow-up visits at either the clinic or the infection prevention and control department. Thus, the outcome of the infection and his adherence to the prescribed treatment remain unknown.

Discussion:-

Saudi Arabia, as an Islamic country, imposes religious and legal restrictions on sexual relationships, limiting them to married spouses only. This framework plays a critical role in reducing the incidence of sexually transmitted infections (STIs) and, consequently, antimicrobial resistance. Despite this, STIs remain a sensitive topic within the country, as patients may be hesitant to disclose extramarital sexual activity. This reluctance can hinder effective treatment and surveillance, particularly in cases involving antibiotic-resistant infections.

Upon reviewing the literature, we found no documented prevalence of ceftriaxone-resistant N. gonorrhoeae in Saudi Arabia. Additionally, this case represents one of the few reports, if any, of ceftriaxone-resistant N. gonorrhoeae in the region. The patient in this study had engaged in a single extramarital sexual encounter, which likely led to the infection. His admission of anal intercourse with this partner highlights a potential route of transmission, supported by literature indicating that anal intercourse is a known risk factor for STI acquisition.[7]

One of the key risk factors for the development of antimicrobial-resistant STIs is having multiple sexual partners.[8] In this case, the patient was unable to provide information on the sexual history of his partner, as their encounter was brief and unplanned. This uncertainty complicates our understanding of the infection's source and raises concerns about the potential for further transmission, particularly if the partner had multiple sexual contacts.

Furthermore, as noted in the literature, N. gonorrhoeae has shown an alarming capacity to develop resistance to antibiotics, including ceftriaxone.[3] This patient's non-adherence to follow-up care, combined with the difficulty in tracing and treating sexual contacts, exemplifies the challenges faced in managing such infections. Comprehensive public health strategies, including patient education, enhanced STI screening, and robust contact tracing, are essential in addressing these gaps.

This case highlights several critical aspects of managing sexually transmitted infections (STIs), specifically Neisseria gonorrhoeae infections, in a young, sexually active male. Gonorrhea remains one of the most common STIs globally, with an estimated 87 million cases annually, making its proper diagnosis and management vital for both individual patient outcomes and public health considerations.[1] Early identification and effective treatment are essential to prevent complications such as urethral stricture, infertility, and dissemination of the infection.

The patient in this case had a history of unsafe sexual practices, which put him at high risk for recurrent infections. His presentation with dysuria and purulent urethral discharge is consistent with typical symptoms of gonococcal urethritis. The isolation of Neisseria gonorrhoeae from the urethral discharge culture confirmed the diagnosis. Resistance to ceftriaxone in the culture is a key concern, as it represents an increasing trend of antibiotic resistance

in N. gonorrhoeae globally.[2,3] This case is especially relevant in light of recent data demonstrating a rise in multidrug-resistant Neisseria gonorrhoeae strains, which complicates the empirical treatment traditionally used to manage these infections.[4]

Empirical treatment for gonorrhea usually includes ceftriaxone in combination with azithromycin, which covers both N. gonorrhoeae and potential co-infection with Chlamydia trachomatis.[5]

In this case, the patient initially received the standard recommended regimen, despite later culture results revealing ceftriaxone resistance. Fortunately, the susceptibility of N. gonorrhoeae to tetracycline and ciprofloxacin provides alternative treatment options. The emergence of ceftriaxone-resistant strains, however, underscores the importance of routine culture and susceptibility testing to guide therapy, as outlined by the Centers for Disease Control and Prevention (CDC) guidelines.[6]

The patient's non-adherence to follow-up appointments presents a significant challenge in STI management, as missed follow-ups can lead to incomplete treatment, persistent infection, and increased risk of transmission to sexual partners. Public health efforts must address barriers to follow-up, including education on the importance of completing treatment and engaging in regular STI screenings for at-risk individuals.[7] Additionally, the referral to the infection prevention and control department was appropriate, given the risks associated with resistant strains, but the patient's failure to attend highlights the need for more effective communication and patient engagement strategies.

The detection of HSV IgG antibodies indicates previous exposure to herpes simplex virus, a common co-infection in patients with STIs.[8] While the patient did not report any symptoms of herpes reactivation, awareness of such co-infections is essential, as they can complicate the clinical presentation and management of STIs.

This case also illustrates the ongoing public health challenge posed by STIs, particularly as antimicrobial resistance continues to rise. Strengthening surveillance systems, promoting safe sexual practices, and ensuring adherence to treatment protocols are essential measures to prevent the spread of resistant gonococcal strains.

The management of this patient emphasizes the necessity of routine culture and susceptibility testing in guiding therapy for gonococcal infections, particularly in the face of growing antimicrobial resistance. Educating patients on the importance of follow-up care and STI prevention remains a critical aspect of comprehensive sexual health care. Further studies are needed to explore alternative treatment options for ceftriaxone-resistant N. gonorrhoeae and to assess public health strategies aimed at improving adherence to STI treatment and follow-up.

Conclusion:-

This case illustrates the complexities of managing ceftriaxone-resistant N. gonorrhoeae in a context where cultural and societal factors influence patient disclosure and follow-up. The patient's infection, likely acquired through a single extramarital sexual encounter, underscores the importance of routine culture and susceptibility testing to guide appropriate treatment. Furthermore, the growing threat of antimicrobial resistance demands coordinated public health efforts, including improved surveillance, patient education, and treatment adherence strategies. Future research should focus on better understanding the prevalence of antibiotic-resistant N. gonorrhoeae in Saudi Arabia and developing alternative therapeutic options.

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