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CONCOMITANT RECURRENT GENITAL HERPES AND GENITAL WARTS IN A YOUNG MALE WITH INSULIN-DEPENDENT DIABETES MELLITUS: A CASE ANALYSIS & TREATMENT APPROACH

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ABSTRACT: We present the case of a 25-year-old unmarried male driver diagnosed with recurrent genital herpes (RGH) and genital warts, associated with insulin-dependent diabetes mellitus (IDDM). The patient reported a history of unprotected sexual intercourse with a commercial sex worker (CSW) four months prior. He developed multiple painful genital erosions and verrucous growths on the penile shaft. Laboratory investigations confirmed HSV-2 and HPV infection. The patient was treated with oral acyclovir 800 mg four times daily for 7 days for RGH and topical imiquimod 5% cream thrice weekly for genital warts. The treatment resulted in complete resolution of symptoms without recurrence. This case highlights the importance of early diagnosis, targeted therapy, and preventive counseling in managing STIs, especially in immunocompromised individuals like diabetic patients. Additionally, it underscores the need for safe sexual practices, routine STI screening, and HPV vaccination to reduce disease burden and complications in high-risk populations.

INTRODUCTION: Sexually transmitted infections (STIs) caused by herpes simplex virus (HSV) and human papillomavirus (HPV) are among the most prevalent viral infections worldwide. In 2020, approximately 26 million new HSV-2 infections occurred among individuals aged 15–49 years, contributing to a total of 520 million people living with HSV-2 globally [1].

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Similarly, genital warts caused by HPV are widespread, with certain high-risk HPV types responsible for approximately 70% of cervical cancers and a significant proportion of anogenital malignancies [2]. The coexistence of HSV and HPV not only exacerbates disease burden but also complicates treatment outcomes due to their distinct pathological mechanisms.

Management of HSV infections typically involves antiviral medications such as acyclovir, valacyclovir, or famciclovir, which reduce symptom severity, recurrence, and viral shedding [3]. Despite the availability of these treatments, recurrent infections are common, particularly in immuno-compromised individuals, including those

with diabetes mellitus [4]. HPV-associated genital warts are primarily managed through topical therapies like imiquimod, podophyllotoxin, or sinecatechins, alongside procedural interventions such as cryotherapy or surgical excision for resistant cases [3]. Vaccination against HPV has emerged as a key preventive strategy, significantly reducing the incidence of genital warts and associated cancers in vaccinated populations [2].

Individuals with diabetes mellitus are at an increased risk of severe and recurrent viral infections due to compromised innate and adaptive immune responses. Hyperglycemia contributes to impaired leukocyte function, delayed wound healing, and a pro-inflammatory state, making infection management more challenging. This case underscores the importance of addressing underlying comorbidities, optimizing glycemic control, and providing comprehensive STI education to reduce the burden of recurrent infections and improve overall health outcomes in vulnerable populations. Here, we present a case of recurrent genital herpes and genital warts in an insulin-dependent diabetic male [4].

Case Presentation: A 25-year-old unmarried male, working as a driver, presented with painful genital erosions and verrucous lesions on the penile shaft for one month. He reported a history of unprotected sexual intercourse with a CSW four months prior. The patient is an insulin-dependent diabetic under regular follow-up at a diabetic clinic.

On examination, multiple erythematous erosions were noted on the glans penis, consistent with recurrent genital herpes. Additionally, verrucous growths characteristic of genital warts were observed on the penile shaft and in the inner aspect of prepuce. Laboratory investigations confirmed HSV-2 and HPV infection. This case was reported at Tagore Medical College, Chennai, where the patient underwent Enzyme-Linked Immunosorbent Assay (ELISA) for HSV-2 to detect specific IgG and IgM antibodies, confirming the infection. For HPV, polymerase chain reaction (PCR) testing was performed to identify high-risk and low-risk HPV genotypes. The patient's HIV and HBsAg tests were negative, while VDRL and TPH tests were positive, indicating serological evidence of syphilis. These tests provided a definitive diagnosis and guided targeted treatment strategies. The commonly performed blood tests in Tamil Nadu for HSV-2 include the Enzyme-Linked Immunosorbent Assay (ELISA) for detecting HSV-2-specific IgG and IgM antibodies, which help in differentiating past and recent infections. Additionally, type-specific glycoprotein G-based serology tests are utilized for a more accurate diagnosis. For HPV, PCR-based assays and hybrid capture techniques are commonly used to detect and genotype HPV strains. These tests are widely available in tertiary care hospitals and advanced diagnostic laboratories across Tamil Nadu, ensuring precise identification and management of infections.

FIG. 1: GENITAL HERPES LESION

FIG. 2: GENITAL WARTS

Treatment and Outcome: The patient was treated with oral acyclovir 800 mg four times daily for one week for RGH, which is the standard high-dose therapy for recurrent herpes infections to reduce viral replication and promote faster healing. Complete healing of erosions was achieved by the end of the treatment course, and the patient did not report any significant adverse effects.

For genital warts, topical imiquimod 5% cream was applied thrice weekly as an immune response modifier, stimulating the local immune system to clear the infection. All warts resolved after three weeks of treatment, demonstrating a good response to therapy without requiring additional interventions such as cryotherapy or surgical excision.

The patient was extensively counselled on STI prevention strategies, including the consistent and correct use of condoms to reduce the risk of transmission and reinfection. Additionally, regular health check-ups, including routine STI screening, were advised to monitor for potential asymptomatic infections and ensure early intervention. Special emphasis was placed on glycaemic control as an essential factor in reducing recurrent infections, as poor glycaemic regulation is associated with an increased risk of prolonged and severe HSV and HPV manifestations. The patient was advised to maintain strict adherence to his insulin regimen and dietary modifications to enhance immune function and improve his overall prognosis.

DISCUSSION: The coexistence of HSV and HPV infections is well-documented, particularly in individuals with risk factors such as unprotected sexual activity and diabetes mellitus. Studies have reported that immunocompromised individuals, especially those with diabetes or HIV, are at a higher risk of persistent and recurrent dual viral infections due to defective cellular immunity [5]. Diabetes predisposes patients to recurrent and severe manifestations of viral infections due to impaired cellular immunity, leading to increased viral shedding, prolonged healing time, and higher recurrence rates [6].

Recent studies indicate that individuals with immunosuppressive conditions, particularly HIV, face a heightened risk of multiple STI co-infections. A Taiwan-based study on HIV-positive MSM found a significant prevalence of bacterial STIs, underscoring the need for targeted screening and treatment strategies. While HIV-related immunosuppression in STI co-infections is well-documented, direct evidence linking diabetes to increased STI susceptibility remains limited. However, diabetes impairs immune function, potentially elevating infection risk. Further research is needed to clarify its role in STI co-infections [7].

Recent studies have highlighted that co-infections of herpes simplex virus (HSV) and human papillomavirus (HPV) are more frequently observed in immunocompromised patients, necessitating a more aggressive treatment approach. In immunocompromised individuals, HSV infections can be more aggressive, persistent, and even life-threatening. Acyclovir and its derivatives are the gold standard antiviral drugs for the prevention and treatment of HSV infections. However, in immunocompromised patients, HSV infections tend to be more widespread, atypical, and persistent, requiring prompt and aggressive antiviral therapy. Additionally, acyclovir resistance may develop, especially in immunocompromised patients, necessitating alternative antiviral therapies [8].

Additionally, Workowski documented that such dual infections result in increased recurrence rates, requiring long-term suppressive therapy and enhanced monitoring [3]. Management of genital herpes involves antiviral therapy, which reduces symptom duration and viral shedding. Comparative studies have shown that antiviral regimens such as acyclovir and valacyclovir significantly decrease recurrence rates and viral load in immunocompromised patients, though treatment response can vary based on individual immune status. In this case, oral acyclovir 800 mg four times daily for 7 days was effective in controlling RGH [9, 10, 11]

Similar studies, such as those conducted by Patel *et al.*[12], have reported that immunocompromised patients, including diabetics, often require prolonged antiviral therapy due to delayed immune clearance. The efficacy of high-dose acyclovir in reducing symptom duration and recurrence has been well-documented in clinical trials, including a randomized study by Patel *et al.*[12], which demonstrated superior viral suppression in immunocompromised patients compared to standard dosing regimens

Additionally, research indicates that immuno-compromised individuals often experience prolonged viral shedding and delayed immune clearance, necessitating extended antiviral therapy. These findings underscore the importance of tailored antiviral regimens and vigilant monitoring

in immunocompromised populations to effectively manage and mitigate recurrent viral infections [13]. Genital warts, caused by HPV, were successfully treated with topical imiquimod, an immune response modifier known for its ability to enhance the host immune response against HPV-infected cells. Imiquimod works by stimulating the production of cytokines, particularly interferon-alpha, which aids in viral clearance. This choice was based on multiple studies demonstrating its efficacy in immunocompetent individuals, as well as in diabetic patients who may have impaired immune responses [14]

Recent studies have continued to evaluate the efficacy of imiquimod in treating anogenital warts, particularly in immunocompromised populations. A comprehensive review published in 2022 examined various treatment approaches for cutaneous warts, including the use of imiquimod. The review highlighted that, while imiquimod may take longer to achieve complete wart resolution, it offers sustained clearance with a lower risk of scarring, making it an appropriate choice for this patient. Despite the availability of multiple therapeutic options, recurrence rates of genital warts remain a significant concern, with most warts reappearing within three months' post-treatment. This underscores the necessity for ongoing research to optimize treatment protocols and reduce recurrence rates, especially in patients with compromised immune systems [15].

Additionally, a 2022 study focused on establishing a prediction model for the recurrence of condyloma acuminatum (genital warts) after treatment. The researchers found that recurrence rates varied widely, ranging between 35% and 75%, influenced by factors such as the patient's immune status and the treatment modality employed. Notably, diabetic patients and those with compromised immune systems exhibited higher recurrence rates of HPV-related lesions, often necessitating adjunctive therapies such as cryotherapy or electrocautery. These findings emphasize the importance of personalized treatment plans and vigilant follow-up care to manage and mitigate the risk of recurrence in immunocompromised individuals [16]. Imiquimod is a valuable treatment for anogenital warts; however, its efficacy can be influenced by the patient's immune status. High post-treatment recurrence rates, ranging from 25% to 67%, highlight the necessity for personalized therapeutic strategies and continuous monitoring, especially for immunocompromised patients. Recent studies underscore the critical role of counselling and education in managing sexually transmitted infections (STIs). Emphasizing safe sexual practices, adherence to treatment, and vaccination against human papillomavirus (HPV) are pivotal in reducing infection rates and associated complications. The Centres for Disease Control and Prevention (CDC) recommend routine HPV vaccination for individuals aged 11 or 12 with catch-up vaccinations up to age 26 for those not previously immunized [8].

In diabetic patients, maintaining optimal glycaemic control is essential, as elevated blood glucose levels can compromise immune function, increasing susceptibility to infections, including STIs. The National Institutes of Health (NIH) advises regular monitoring of blood glucose levels and adherence to prescribed treatments to manage diabetes effectively [17]. Regular STI screenings are vital for early detection and treatment, thereby minimizing the risk of reinfection and severe health outcomes. The CDC provides specific screening recommendations based on individual risk factors and demographics, highlighting the importance of personalized care [8].

In summary, integrating patient education on safe sexual practices, ensuring adherence to treatment protocols, and maintaining optimal glycaemic control in diabetic patients are fundamental strategies in managing and preventing STIs. Personalized treatment plans and vigilant follow-up care are essential to mitigate the risk of recurrence, especially in immunocompromised individuals.

CONCLUSION: This case underscores the importance of early recognition and management of dual STIs in individuals with chronic comorbidities. Tailored treatment, patient education, and regular follow-up are critical to preventing recurrence and complications.

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