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Case Report

An alternative method for Laboratory diagnosis and treatment of syphilis

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Abstract

A 40 year old male patient presented with ulcer over genetalia since one week. On examination there was an ulcer over penis which was painless, indurated circumscribed associated with inguinal lymphadenopathy. A wet mount was prepared and examined under Light Microscopy with innovative modification showed spiral shaped bacteria against black background. Under resource poor setting where Dark ground Microscope can't be used, light Microscope may be converted to Dark scope using Over Head Projector Sheets which will be helpful in diagnosis of Syphilis. Treatment with Doxycycline is effective in patients who are not responding to Injection Penicillin, which is being demonstrated by four fold reduction in Rapid Plasma Reagin titer.

Keywords: Syphilis, Dark ground Microscope, Light Microscope.

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1. Introduction

Syphilis is a sexually transmitted infection (STI) caused by Treponema pallidum subsp. Pallidum. It is observed that the incidence of Syphilis is increasing in the recent years and continues to be a global important problem.[1,2]

The disease is seen in higher number in endemic region, underdeveloped countries and also in populations of men who have sex with men (MSMs) with an estimated incidence of six million infections every year.[3]

Initially the symptoms begins as painless chancre of first stage of syphilis or symptoms of distinctive maculopapular rashes seen over the palms and soles of secondary stage of syphilis.[4]

The diagnosis of syphilis depends upon the clinical presentation and stage of disease. The following are the choice of investigations.[5]

1. Darkfield microscopy
2. Fluorescent antibody staining
3. Immunohistochemistry
4. Polymerase chain reaction

In resource-poor settings like in villages or peripheral hospitals, laboratory services for Sexually Transmitted Infection are either not available, or where limited services are available, patients may not be able to diagnose and fail to initiate the treatment.[6]

The WHO STI (Sexually transmitted infection) guideline suggests using benzathine penicillin G 2.4 million units once intramuscularly over procaine penicillin G 1.2 million units 10–14 days intramuscularly in adults and adolescents with early syphilis. Due to allergy or non-availability or stockout of benzathine or procaine penicillin, the WHO STI guideline suggests using doxycycline 100 mg twice daily orally for 14 days or ceftriaxone 1g intramuscularly once daily for 10–14 days, or, in special circumstances, azithromycin 2g once orally.[7]

2. Case Presentation

40 yr old male patient nursing orderly by occupation comes to Skin OPD with history of ulcer over the genitalia since 1

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week with no comorbidities. On General Examination he was moderately built, nourished and inguinal lymph nodes were enlarged. Local examination showed painless ulcer over glans penis, circumscribed and indurated. He gives past history of VDRL test positive when he got admitted for Covid19 positive in the hospital one month back. He also gives history of taking 2 doses of injection penicillin parenterally adviced by doctor, but he had not developed lesions anywhere in the body at that time. He doesn't give history of sexual promiscus behavior. A wet mount was prepared from the genital ulcer and looked under Light Microscope converted into Dark ground scope. Spiral shaped bacteria were seen. VDRL test was done which was found to be positive. For confirmation the blood sample was tested for TPHA test, which was positive and titre was very high of about 2560. An RPR test was positive and the titre was 1:64. Benzathine Penicillin injection was given and he was followed up for 3 months. Since the RPR titre didn't decrease Tablet Doxycycline 100mg BD was advised for 28 days. The RPR test was repeated after 3 months of treatment which showed titre was reduced to 1:8. He didn't develop any lesions after doxycyline therapy.

3. Discussion

Treponema pallidum subsp. pallidum is known to cause a multi stage disease, Syphilis. Syphilis advances by way of recognizable primary, secondary, latent and tertiary stages. In the primary and secondary syphilis stage the ulcers are seen which are abundant in treponemes.[8]

To prevent the spread of the disease effectively early accurate diagnostic tool and effective treatment is very important.[9] The Darkfield microscope was invented by J.J Lister (Joseph Lister's Father) in 1830. He changed the abbe condenser to darkfield condenser. The principle is making the light to fall indirectly allowing the smallest organism to be visible.[10]

The present case presents with painless, indurated, circumscribed ulcer which was classic features of Syphilis. With all necessary aseptic precautions, the lesion was cleaned with swab soaked in normal saline. The serum exudate was collected and placed on a clean glass slide by squeezing the lesion. Next cover slip was placed and pressed gently.[11]

A trail method was done to convert Light Microscope into dark ground Microscope. OHP Sheets were taken and was cut in circular shape fitting to the Condenser/iris aperture. The Centre of these circular shape sheets were shaded with Black marker leaving the periphery unmarked. About 8 to 10 sheets were placed inside the iris aperture and visualized under Low and High field Objective similar to study by Yürekli, Aslan et al.[12] Thus, we were able to convert to Dark field Microscope and visualize the spiral shaped bacilli. (**Figure 1**)

Figure 1: Treponema pallidum seen under modified light microscope 40x

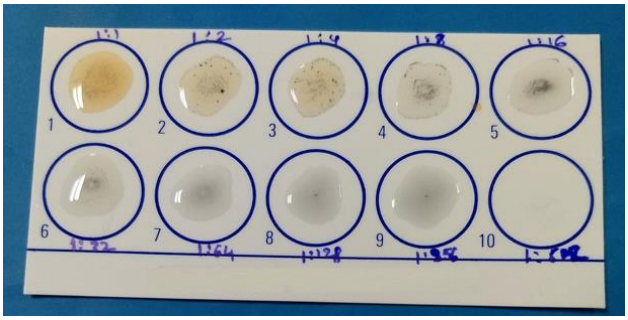

Figure 2: Rapid plasma reagin antibody test titer 1:32 (Before Treatment)

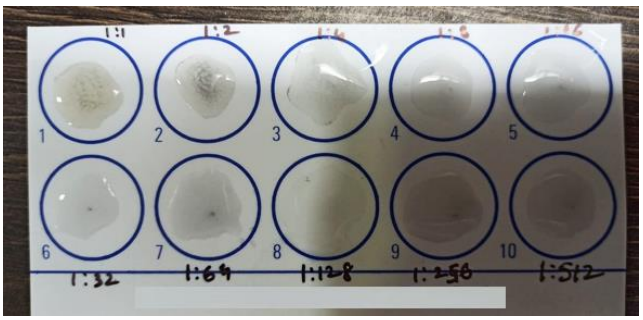

Figure 3: Rapid plasma reagin antibody test titer 1:4 (After Treatment)

Creating/Optimizing the dark field conditions similar to Dark ground Microscopy is very difficult. The cost of Dark field Microscope is much higher than Light Microscope, hence in resource poor settings this technique may be helpful and it may be standardized. Regarding treatment Benzathine Penicillin was given 2 months before the start of lesion, but it responded well to Tablet Doxycyline 28 days by 4-fold reduction in RPR titre. The patient was followed up for next 6 months, he didn't develop any lesions.

4. Conclusion

In the present case scenario Doxycycline treatment was effective in comparison with Benzathine Penicillin and this method can be used in resource poor settings where dark ground microscope can't be used where, Light Microscope can be converted into Dark field Microscope and structures like Treponema pallidum can be identified.

5. Source of Funding

None.

6. Conflict of Interest

None.

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