

## CASE REPORT

## OPEN ACCESS

# Disseminated gonococcal infection in 21st century: A case report

Sumir Kumar, Bharat Bhushan Mahajan, Sandeep Kaur

## ABSTRACT

**Introduction:** Disseminated gonococcal infection (DGI) is an uncommon complication associated with *Neisseria gonorrhoeae*. But due to early diagnosis and use of newer drugs in gonorrhea, complications like DGI have become a rarity. It is more common in women than men. We herein report a case of this entity occurring in otherwise healthy male who presented with septic shock. **Case Report:** An 18-year-old healthy male presented with urethral discharge, conjunctivitis, oral ulcerations, and tenosynovitis along with septic shock. History of unprotected sexual contact was present two weeks prior to the onset of above mentioned complaints. A clinical diagnosis of DGI was kept which was confirmed by the presence of gram negative diplococci in urethral and conjunctival discharge smears as well as isolation of gonococci on selective culture media. He responded well to injectable ceftriaxone therapy. **Conclusion:** The presentation of DGI as septic shock in an immunocompetent male in the absence of predisposing factors is highlighted in

this case report. Early diagnosis and treatment is the key to prevent devastating complications like meningitis, endocarditis, perihepatitis, etc. Moreover, infrequent occurrence of DGI calls for the need of introduction of diagnostic criteria in order to facilitate its prompt identification and treatment.

**Keywords:** Disseminated gonococcal infection (DGI), Gonorrhea, *Neisseria gonorrhoeae*, Shock

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## INTRODUCTION

Disseminated gonococcal infection (DGI) is caused by hematogenous spread of *Neisseria gonorrhoeae* which may lead to symptoms and signs, such as tenosynovitis, dermatitis, and arthritis (in order of decreasing frequency). Approximately, 62 million new cases occur annually worldwide [1]. In India also, its prevalence ranges from 3–19% among sexually transmitted infection (STI) clinic attendees. However, DGI occurs in 0.5–3% of patients infected with *Neisseria gonorrhoeae*. But due to early diagnosis, and use of newer drugs in the treatment of gonorrhea, complications like DGI have become a rarity. We are reporting a case of a young immunocompetent male with DGI and septic shock for the rarity of this condition.

**CASE REPORT**

An 18-year-old male presented with complaints of greenish yellow discharge from eyes, multiple painful ulcers along with blood stained discharge in mouth, dysuria and mucopurulent urethral discharge for one week. There was history of high grade fever, malaise, myalgias and arthralgia. The patient was unmarried and welder by occupation. He had regular unprotected sexual contact and the last contact was about two weeks ago.

On examination, the patient was febrile and hypotensive with blood pressure of 80/60 mmHg. Bilateral preauricular, cervical as well as inguinal lymph nodes were enlarged and tender. Systemic examination was found to be normal. There was profuse, thick mucopurulent discharge from both eyes with congested conjunctiva (Figures 1 and 2). Thin translucent membrane was present over bilateral bulbar conjunctiva. Multiple ulcers with blood-tinged serous discharge and thick yellowish slough were seen on tongue, labial, buccal, palatal mucosae and posterior pharyngeal wall (Figure 3). Nasal mucosa was crusted. There was profuse, thick mucopurulent urethral discharge with secondary phimosis (Figure 4). There was tenosynovitis on dorsal aspect of wrist and ankles.

Hemogram showed mild leukocytosis but other routine investigations were within normal limits. Urine was full of pus cells and RBC's with mild albuminuria. Gram stain of both ocular and urethral discharge smears showed intracellular gram-negative kidney-shaped diplococci. Pus culture on chocolate agar media also revealed the presence of gonococci. Blood and urine culture came out to be negative for gonococci. Results of serologic analysis for systemic lupus erythematosus (SLE), human immunodeficiency virus, hepatitis and syphilis were negative. Chest X-ray, ECG and ultrasound of abdomen were normal.

Patient was taking multiple unknown oral medications from a private practitioner but was not relieved. After diagnosis, patient was put on intravenous ceftriaxone 1 g twice a day along with doxycycline to treat chlamydia which is commonly associated with gonococcal infection and diagnostic facilities to rule out chlamydial infection were not available at our hospital. The patient started responding after two days. Repeat smears from ocular, oral and genital discharge were negative after seven days of starting the treatment with significant clinical improvement.



Figure 1: Bilateral conjunctivitis.



Figure 2: Close-up view showing profuse, thick, mucopurulent discharge from eyes.



Figure 3: Multiple ulcers with blood tinged discharge present on lips and palate.



Figure 4: Phimosis with urethral discharge.

## DISCUSSION

Though gonorrhea is one of the common sexually transmitted infections in India, it is showing a declining trend in the last decade [2]. Similarly, cases of gonococemia are also becoming a rarity.

The probability of dissemination of a localized gonococcal infection depends upon specific host, microbial, and possibly immune factors.

**(A) Host factors:** Disseminated gonococcal infection is approximately three times more common in women than men. A history of recent symptomatic genital infection is uncommon in men or women with DGI; asymptomatic mucosal infection is thought to be the predisposing factor for dissemination in most patients, [3] but our patient had symptomatic genital infection. Women are affected thrice commonly than males due to larger area of contact and asymptomatic nature of infection in females leading to longer period of survival for organism [4]. Other important risk factors for DGI include recent menstruation, pregnancy or the immediate postpartum state, congenital or acquired complement deficiencies, systemic lupus erythematosus or HIV. But our patient was immunocompetent young male and was devoid of these risk factors.

**(B) Microbial factors:** Strains that are associated with dissemination have the following characteristics:

- They contain low molecular weight protein 1A.
- They require arginine, hypoxanthine, and uracil for growth.

**(C) Immune factors:** Several evidences in favor of this hypothesis include frequent absence of positive blood, skin, and synovial fluid cultures as well as PCR negativity in some of culture-negative patients. Further support for role of immunological factors in pathogenesis of DGI comes from presence of gonococcal cell-wall components, gonococcal antibody, and complement in skin lesions. Circulating immune complexes have also been found in some studies [5].

Patients with disseminated gonococcal infection (DGI) typically present with one of two syndromes [3]:

- (1) The tenosynovitis, dermatitis, polyarthralgia syndrome: Its acute phase include malaise, fever and chills. Tenosynovitis is a unique finding characterized by involvement of multiple tendons, particularly at the wrist, fingers, ankle, and toes. Dermatitis commonly consists of few, painless lesions which are usually pustular or vesiculopustular, with rare occurrence of papules, nodules, bullae or hemorrhagic macules. The

white blood cell count can be elevated or normal in patients with this form of DGI.

- (2) Purulent arthritis without skin lesions—knees, wrists, and ankles are most commonly involved in patients with this form of DGI. Polyarthrititis, when present, is typically asymmetric. Most patients are afebrile.

Disseminated gonococcal infection is one of the rare and dreaded complications of gonorrhea which may further lead to permanent joint damage, endocarditis, myocarditis, pericarditis, hepatitis, meningitis or epidural abscess. It can also rarely be associated with septic shock leading to multiple organ failure and death [6]. Our patient initially went into septic shock but was relieved after proper management. Later on, phimosis occurred for which surgical consultation was taken.

Gonorrhea is usually diagnosed by the clinical presentation, identification of the organism on gram stain and isolation on culture media like chocolate agar media, modified Thayer-Martin media, Chacko-Nair media, Martin-Lewis media or New York City media. Newer techniques include nucleic acid amplification test (NAAT), polymerase chain reaction (PCR), transcription mediated amplification and standard displacement amplification on endocervical, urethral and urine specimens. In patients with purulent arthritis, the best diagnostic method is synovial fluid analysis. However, synovial fluid cultures yield negative results in patients with tenosynovitis, dermatitis, and polyarthralgia form of DGI. The diagnosis of gonococemia in our case was made on the basis of the characteristic clinical picture and was confirmed by gram's staining of ocular as well as urethral discharge smear and growth on culture media.

Third generation cephalosporins like ceftriaxone are recommended as the initial empirical therapy in gonococcal infections due to emergence of resistance to penicillins and fluoroquinolones [7]. Our patient also responded to intravenous ceftriaxone in about one week.

## CONCLUSION

The presentation of disseminated gonococcal infection (DGI) as septic shock in an immunocompetent male in the absence of predisposing factors is highlighted in this case report. Early diagnosis and treatment is the key to prevent devastating complications like meningitis, endocarditis, and perihepatitis. Moreover, infrequent occurrence of DGI calls for the need of introduction of diagnostic criteria in order to facilitate its prompt identification and treatment.

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### Author Contributions

Sumir Kumar – Substantial contributions to conception and design, Acquisition of data, Analysis and

interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Bharat Bhushan Mahajan – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Sandeep Kaur – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

### Guarantor

The corresponding author is the guarantor of submission.

### Conflict of Interest

Authors declare no conflict of interest.

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