Evaluation of a Molecular Syndromic Panel for Infectious Genital Ulcer Diagnosis

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BACKGROUND

Genital ulcer disease (**GUD**) is commonly caused by *sexually transmitted infections* (STIs) and typically occurs in genital, anorectal, or perineal areas, with herpes simplex virus (HSV) and *Treponema pallidum* (TP) being the most frequent pathogens, while *Haemophilus ducreyi* (HD) and *Chlamydia trachomatis* serovar L (CT-LGV) occur less often. Recently, mpox, caused by monkeypox virus (MPXV), has emerged as an additional differential diagnosis in GUD.

While clinical examination is essential, atypical presentations can hinder accurate diagnosis and delay treatment. This study aimed to assess the results of a molecular syndromic panel for GUD, evaluating its diagnostic concordance with routine methods.

METHODS

Between November 2024 and December 2025, individuals with vesicular or ulcerative lesions were visited at two sexual health clinics in Milan.

Samples were collected using **Universal Transport Medium (UTM®) - RT system** (Copan, Italy)

Samples were tested with the **Genital Ulcer Real-Time PCR kit** (Vircell, Spain) that simultaneously detects:

1. *Chlamydia trachomatis* serovar L (CT-LGV)
2. Herpes Simplex Virus (HSV) 1/2
3. *Treponema pallidum* (TP)
4. *Haemophilus ducreyi* (HD)
5. Varicella-zoster virus (VZV)
6. Mpox Virus (MPXV)

►

One Swab, Six Pathogens: Molecular Syndromic Testing Redefines Genital Ulcer Diagnosis

►METHODS

Standard routine diagnostic tests performed on clinical suspicion included:

1. Rapid Plasma Reagin and *T. pallidum* Hemagglutination Assay for TP antibodies (Bio-Rad, U.S.),
2. DNA detection of HSV-1/2 and VZV (EliTech, France)
3. MPXV (Altona, Germany)
4. CT screening (Seegene, South Korea).

Routine molecular testing for TP, CT-LGV, and HD was not available.

RESULTS

Among 88 cases, 86.4% (76) was biologically male and 15.9% (14) living with HIV. Lesions were primarily genital (70.4%, 62) or anal (27.3%, 24); 44.3% (39) presented with a single lesion. Symptoms included pain (73.9%, 65), lymphadenopathy (10.2%, 9), and fever (10.2%, 9); 22.7% (20) reported no symptoms. The syndromic panel detected HSV-2 in 15.9% (14), HSV-1 in 13.6% (12), CT-LGV in 9.1% (8), MPXV in 9.1% (8), TP in 10.2% (9), and MPXV-HSV-2 coinfection in 1.1% (1). No VZV and HD cases were identified, and 40.9% (36) of samples tested negative for any pathogen evaluated with the Genital Ulcer Real-Time RT-PCR assay. All cases detected through routine DNA testing were also detected with the Vircell assay. Interestingly, one MPXV, one HSV-1 and one HSV-2 were not detected by routine testing.

Concordance with Genital Ulcer Real-Time PCR assay	CT-LGV	HSV-1	HSV-2	TP	HD	VZV	MPXV
C. trachomatis DNA (Allplex™ STI Essential Assay - Seegene)	100%	-	-	-	-	-	-
HSV-1 DNA (HSV1 ELITe MGB® Kit - EliTech)	-	100%	-	-	-	-	-
HSV-2 DNA (HSV2 ELITe MGB® Kit - EliTech)	-	-	100%	-	-	-	-
RPR - TPHA (Syphilis Agglutination Assays - Bio-Rad)	-	-	-	100%	-	-	-
Routine molecular testing for HD not available	-	-	-	-	NA	-	-
VZV DNA (VZV ELITe MGB® Kit - EliTech Group)	-	-	-	-	-	NA	-
MPXV DNA (FlexStar® Monkeypox virus PCR - altona Diagnostics)	-	-	-	-	-	-	100%

CONCLUSIONS

The molecular syndromic panel showed excellent concordance with standard diagnostics and reduced time to diagnosis. Furthermore, the DNA

identification of TP, CT-LGV and HD offers a certain laboratory diagnosis to support clinical practice, and if properly implemented in routine

diagnostics, it could enhance testing strategies for GUD.

PLAIN LANGUAGE SUMMARY

Using a single swab and one comprehensive molecular test, we were able to accurately identify the viruses and bacteria causing genital ulcers—including some infections that standard tests did not detect. Because all pathogens are tested at once, this approach can shorten the time to diagnosis, helping people receive the right treatment sooner and strengthening detection of sexually transmitted infections and emerging outbreaks like mpox

ADDITIONAL KEY INFORMATION

- Study period: November 2024 – December 2025
- Setting: Two sexual health clinics, Milan, Italy
- Sample size: 88 patients with vesicular or ulcerative lesions
- 86.4% biologically male; 15.9% people living with HIV
- 59.1% of cases had an identified pathogen using the syndromic panel
- 100% concordance with available routine molecular diagnostics

Any Questions? → *davide.moschese@unimi.it*