Changes in Sexually Transmitted Infections in the COVID Landscape

Pallavi Upadhyay and Vijay Singh

Molecular Diagnostics, HealthTrackRX, Denton , TX 76207

ASM Microbe 2022
Poster # 5362
06/11/2022

ABSTRACT

Background: The COVID-19 pandemic had a significant global impact on our social behavior including the healthcare sector where lockdown measures interrupted routine screening and preventative care. Sexually transmitted infections are major economic burden with nearly $16 billion spent in direct and indirect annual costs in the United States. There is a paucity of studies that describe the impact of COVID-19 pandemic on STI testing and detection. The goal of our comparative trend study, from 2019 to 2022 was to evaluate the impact of the COVID-19 pandemic on testing and positivity rates for common sexually transmitted infections.
Methods: Data for positive sexually transmitted infections in symptomatic patients detected in our laboratory between 2019 and 2022 was collated and statistical analysis performed to determine alterations in monthly circulation rates. Chi-square tests were performed to establish significant changes in infections patterns during 2020 and 2021 compared to the baseline data from 2019.
Results: Testing was performed on 103, 241 patient samples between January 2019 and December 2021. The first half of 2020 shows a significant downturn in STI testing owing to the lockdown measures that were in place to prevent the spread of SARS-CoV-2. Females, compared to males, comprise a significantly higher proportion of the STI positive population. Interestingly, no significant difference was observed in the positivity rates of several STI pathogens in 2020 when compared to the pre-pandemic baseline data from 2019. Common sexually transmitted infections like Chlamydia, Gonorrhea and Trichomonas display a significant increase during 2021 in comparison to infection instances from 2019 and 2020. Similar observations were made regarding the infection rates of HSV1/2, *Mycoplasma* sp. and *Ureaplasma* sp.
Conclusions: COVID-19 pandemic and the associated non-pharmaceutical preventative measures resulted in lowering of STI screening and preventative initiatives during 2020. Easing of social distancing norms had a direct impact on the very significant increase in STI rates during 2021 observed in the presented data. STIs, with increasing antimicrobial resistance, pose a major individual and public health challenge. As the world adjusts to new normal with COVID-19 an ever-present danger, our study is clarion call for increasing the surveillance of STIs to prevent a sexual and reproductive health epidemic in the near future.

INTRODUCTION

Sexually transmitted infections (STI) continue to rise in the United States, causing a major public health crisis and imposing a tremendous financial burden to the healthcare system. A study conducted by CDC shows that 1 in 5 individuals are living with STI (1). This number is expected to be higher in the young populations (15 to 24 years of age), especially within the minority, vulnerable and high-risk population groups.
According to a study published by WHO (2), approximately 1 million STIs are detected daily, the majority of which comprises of asymptomatic patients, thus depicting the importance of STI screening for prevention and transmission. However, due to the stigma associated with STIs, despite the noted financial and health-associated problems, their impact remains unnoticed.
In the wake of COVID-19 pandemic, STI testing almost decreased by 40% during the pandemic months of Feb to April 2020. however, this decline can be attributed to the reduction in screening and testing (especially for asymptomatic patients) and not necessarily the infection rates (3). Hence a sharp increase in undiagnosed STIs has been speculated.
There is still lack of complete clarity on up-to-date trends and infection rates. COVID-19 pandemic has profoundly impacted STI trend and surveillance during 2020 -- mainly due to lack of timely reporting and treatment for STI rate thus leading to increased transmission rate. While emphasis is still on STI prevention, the precise impact of COVID-19 on STI will unravel in years to come. The current comparative trend study, from 2019 to 2022, will aid in understanding and further evaluation of the impact of the COVID-19 pandemic on testing and positivity rates for common sexually transmitted infections.

MATERIAL & METHODS

Patient samples were received and tested by HealthtrackRX in our laboratory located at Denton, Texas, USA between January 2019 and December 2021. The Open Array™ platform (Thermo Fisher Scientific, California, USA) was employed to perform real-time PCR on nucleic acid extracted from these samples. The following pathogens were tested for: *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Trichomonas vaginalis*, Herpes Simplex Virus 1, 2 (HSV1/2), *Mycoplasma* spp. (*M. genitalium*, *M. hominis*) and *Ureaplasma* spp. (*U. urealyticum*, *U. parvum*). Data for positive sexually transmitted infections in symptomatic patients (deidentified) was collated and statistical analysis performed to determine alterations in monthly circulation rates. Chi-square tests were performed to establish significant changes in infections patterns during 2020 and 2021 compared to the baseline data from 2019. Differences in the infection status of the positive and negative population were calculated as proportions by means of $\chi 2$ analysis ($p < 0.05$). All statistical analyses were performed using R version 3.6.0 (R Foundation for Statistical Computing).

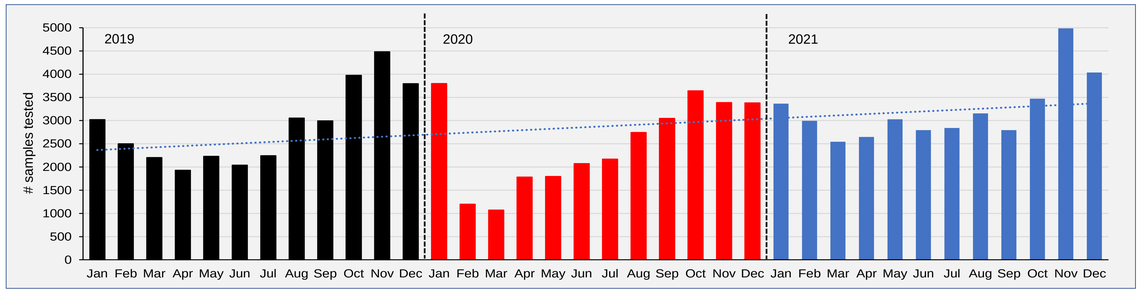

Figure 1: Testing for STIs was negatively impacted by COVID-19. Monthly testing volume for sexually transmitted infections at HealthtrackRx between January 2019 and December 2021

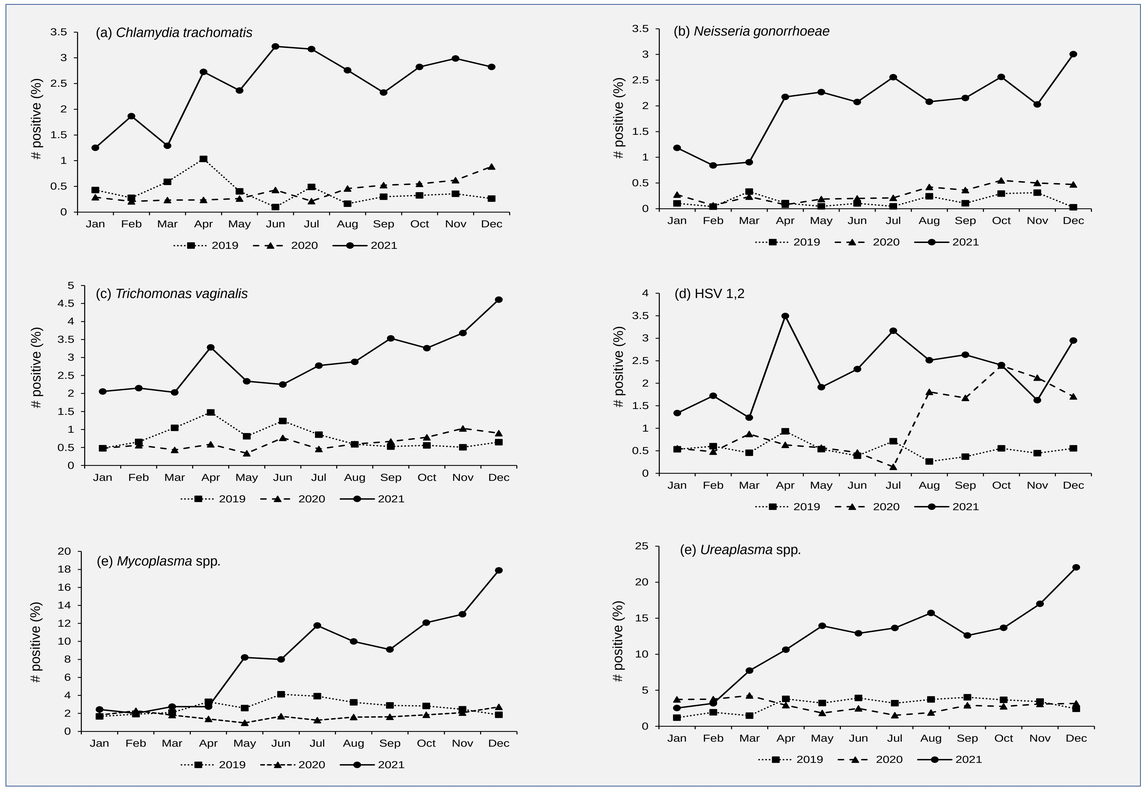

Figure 2: Impact of COVID-19 pandemic on the circulation of STI causing pathogens. Positive detection rate (%) of pathogens causing sexually transmitted infections. (a) *Chlamydia trachomatis*, (b) *Neisseria gonorrhoeae*, (c) *Trichomonas vaginalis*, (d) HSV, (e) *Mycoplasma* spp. and (f) *Ureaplasma* spp.

RESULTS

Data for a total of 103, 241 patients from January 2019 to December 2021 was analyzed for the presence of pathogens causing sexually transmitted infections. The onset of COVID19 pandemic and the subsequent prevention measures that included economic lockdowns and travel restrictions resulted in a 12.7% decrease in the testing volume during 2020 when compared to the samples tested in 2019 (Figure 1). This reduction in testing volume was more apparent between February and April 2020 with STI testing picking up as the lockdown measures were eased in the United States.

In comparison to the baseline data from 2019, the positive detection of *C. trachomatis*, *N. gonorrhoeae*, *T. vaginalis*, *Mycoplasma* spp. and *Ureaplasma* spp. in 2020 demonstrated no significant difference. In contrast, during 2020 significantly higher levels of HSV1,2 detections were observed from August onwards (X^2 (1, N=141)=21.40, p=<0.00001) when compared to the pre-pandemic levels of 2019.

A very significant increase, when compared to 2019 and 2020, in the positive detection rate of all the STI causing pathogens was observed during 2021. Compared to the baseline data from 2019, a 2.5 to 5-fold increase was registered in 2021 (Fig. 2).

CONCLUSIONS

The COVID-19 pandemic has impacted human existence in the most profound manner. Non-pharmaceutical interventions like economic and social lockdowns and travel restrictions had a negative influence on the healthcare sector with routine testing and screening of STIs being suspended.

Experts have speculated that the neglect of STI screening will result in an unsustainable disease burden of these pathogens. Our study provides clear proof that compared to the pre-pandemic levels of 2019, the instances of serious STI causing pathogens like *C. trachomatis*, *N. gonorrhoeae* and *T. vaginalis* have increased significantly during 021. In addition, pathogens like *Mycoplasma* spp. and *Ureaplasma* spp. that are not routinely tested for also display higher detection rates in the population following the resumption of social activities.

Our comparative trend analysis emphasizes the importance of regular and expanded STI screening to avoid a new public health crisis.

References:

1) CDC estimates 1 in 5 people in the U.S. have a sexually transmitted infection https://www.cdc.gov/nchhstp/newsroom/2021/2018-STI-incidence-prevalence-estimates-press-release.html January 25, 2021
.
2) WHO: Sexually transmitted infections (key facts). https://www.who.int/news-room/fact-sheets/detail/sexually-transmitted-infections-(stis) Updated 22 November 2021

3) STDs increased during the first year of the COVID-19 pandemic https://www.cdc.gov/nchhstp/newsroom/2022/2020-STD-surveillance-report.html Updated April12, 2022