

A Record Based Crosssectional Study of Pattern of Sexually Transmitted Infections (Stis) In Precovid and Post Covid Period with Special Emphasis on Behavioural Changes

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ABSTRACT

Background: Sexually transmitted infections (STIs) remain a major public health concern worldwide, and the COVID-19 pandemic caused major disruptions in healthcare services and significant changes in social and sexual behaviour, which might have influenced STI trends.

Objective: To assess the clinical pattern and epidemiology of STIs, three years before and three years after the COVID-19 pandemic and to evaluate for changes in sexual behaviour patterns among a subset of patients.

Methodology: This retrospective study was conducted by analysing the hospital records at the STI clinic in a tertiary care centre Hospital record from the pre-COVID period (2017–2019) and post-COVID period (2022–2024) , including 1,373 pre-COVID and 1,797 post-COVID cases. STIs were classified using the syndromic approach. Statistical analysis was performed using the Chi-square test with $p < 0.05$ considered statistically significant.

Results: A substantial increase in the number of STI cases was observed in the post-COVID era, accompanied by changes in syndromic patterns and sexual behaviour. Females constituted many cases in both periods, and the most affected age group was 25–44 years. Syndromic classification revealed an increase in vaginal/cervical discharge, genital warts, urethral discharge, and serologically positive syphilis after COVID-19, with syphilis showing the highest percentage rise (442.8%). A decline was noted in non-herpetic genital ulcers, lower abdominal pain syndrome, and inguinal bubo. Analysis of sexual behaviour demonstrated a statistically significant increase in the proportion of participants reporting homosexual orientation/behaviour and a rise in the number of individuals not using condoms in the post-COVID period.

Limitations: Retrospective design and dependence on hospital records, which may have resulted in incomplete data. The use of convenient sampling from a single tertiary care centre restricts generalization of the findings to the wider population, and assessment of sexual behaviour in a small randomly selected sample may not fully represent behavioural trends of the entire cohort.

Conclusion: There was a substantial rise in proportion of STIs in the post-COVID era. with notable changes in syndromic patterns and sexual behaviour. Reduced condom usage highlights the need for strengthened STI surveillance, targeted health education, and promotion of safe sexual practices in the post-pandemic period.

Keywords: COVID-19 pandemic Sexually transmitted infections, , Syphilis, Sexual behavior

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INTRODUCTION

Sexually transmitted infections (STIs) spread predominantly by unprotected sexual contact. According to WHO, more than 1 million curable STIs are acquired

every day worldwide in people of 15–49 years old, the majority of which are asymptomatic.¹

The COVID-19 pandemic, an unprecedented global health crisis, profoundly impacted all aspects of healthcare

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delivery and utilization. Lockdowns, travel restrictions, and the reallocation of healthcare resources towards pandemic management disrupted routine healthcare services, including STI diagnostics and treatment. Behavioral changes, including reduced social interactions and altered sexual practices, further influenced STI transmission dynamics. Post-pandemic, the resurgence of healthcare services and the normalization of societal interactions might have introduced new trends in STI epidemiology.²

Understanding the changing trends is crucial for adapting healthcare policies, improving patient outcomes, and strengthening the preparedness of healthcare systems for future public health crises.

OBJECTIVES

1. To assess the clinical pattern and epidemiology of sexually transmitted infections three years pre and post COVID19 pandemic.
2. To assess for any changes in sexual behavioural patterns in pre and post covid period ,based on data from 25 patients selected in a random manner by lottery method from each the study group.

METHODOLOGY

Study design- Retrospective study

Study setting- STI clinic in a tertiary care centre in Central Kerala

Study population- 1373 patients in the pre-COVID time and 1797 patients post COVID

Study Period- 6 years (3years pre-Covid and 3 years post Covid)

Sampling technique- Convenient sampling

Study tool- Hospital records

Study procedure-Data from the hospital records were collected and classified STI's based on syndromic approach. Chi square test was used for statistical analysis and P value less than 0.05 was considered to be statistically significant.

RESULTS

There were 1373 cases in three years during Pre COVID time and 1797 in three years, post COVID. The results obtained are summarized below:

Table 1-Number of cases before & after COVID

Years	2017	2018	2019	2022	2023	2024
No of people diagnosed with STI	394	528	451	440	560	797

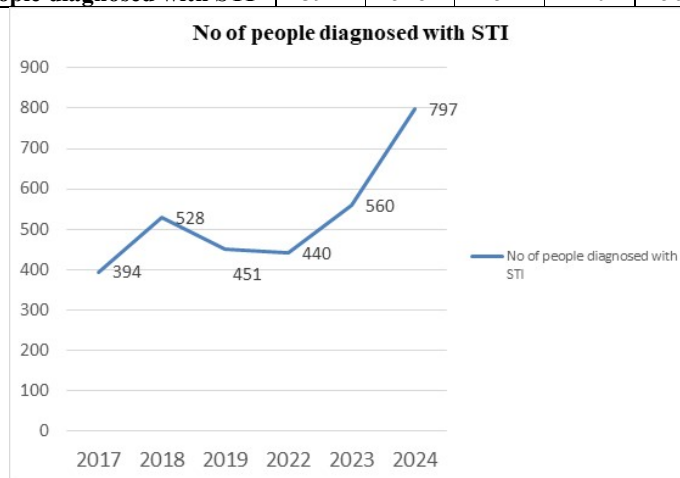


Figure 1-Number of cases before & after covid

An increase in STI cases were seen from 2017-2018. Then a fall in cases were seen during 2018- 2019. Post COVID, there was a marked increase in the number of STI cases .

Table 2 : GENDER DISTRIBUTION

Gender	Pre Covid	Post Covid
Male	244 (17.77%)	466 (25.93%)
Female	1129 (82.23%)	1316 (73.23%)
Transgender	0 (0%)	15 (0.84%)
Total	1373	1797

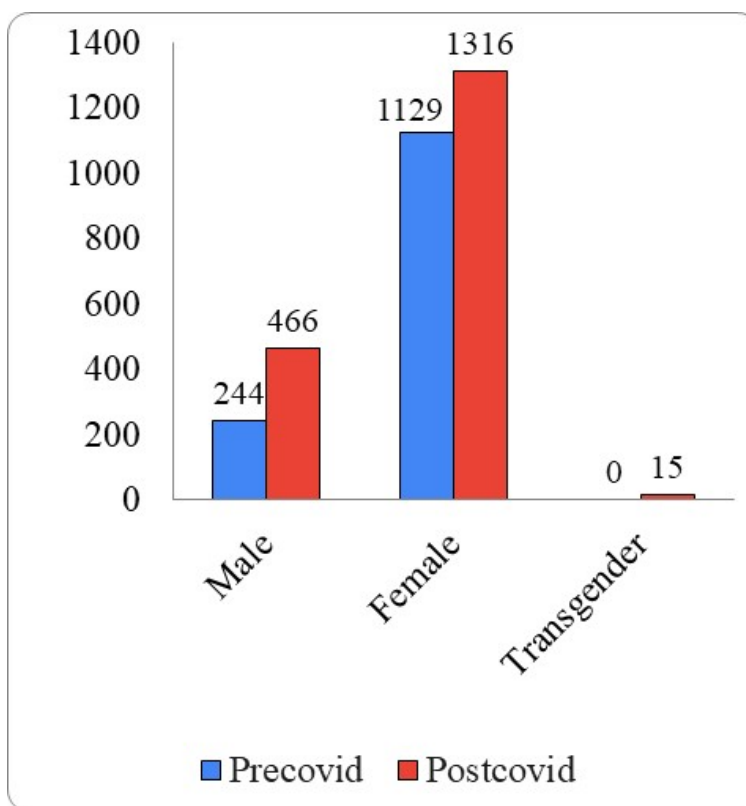


Figure 2-GENDER DISTRIBUTION

There was a rise in cases in all the 3 gender groups after COVID (n=1797) when compared to Pre COVID (n=1373) and the highest number of cases were seen in females. Percentage increase in cases was seen to be most for males (90.98%).

Table 3: AGE DISTRIBUTION

Age of person diagnosed with STI	Pre Covid	Post Covid
<20	37	27
20-24	146	157
25-44	886	1143
>44	304	470
Total	1373	1797
Mean	38.7575	40.7346
Standard Deviation	17.2612	17.8204

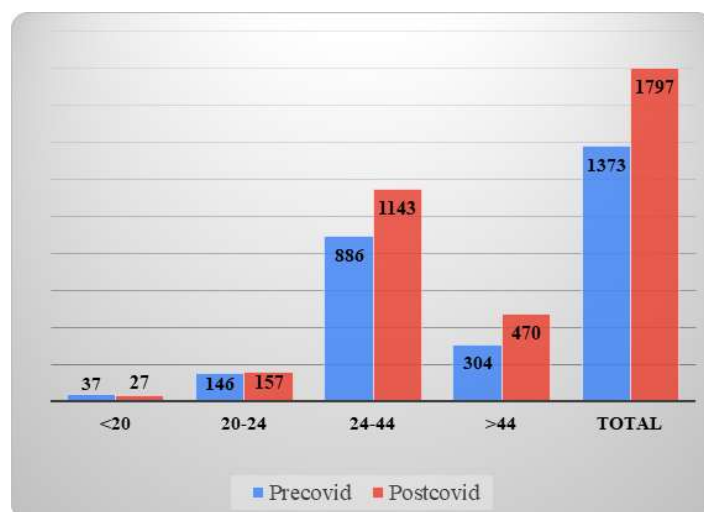


Figure 1

INFERENCE- Decrease in the number of cases in age group less than 20 years were seen post COVID whereas in rest of the age groups there was a rise in the number of cases, highest in age group of 25-44 years.

Table 4: AGE AND GENDER DISTRIBUTION1

Age of person diagnosed with STI		Pre Covid	Post Covid
<20	Male	19	14
	Female	18	11
	TS/TG	0	2
20-24	Male	49	75
	Female	97	76
	TS/TG	0	6
25-44	Male	132	319
	Female	754	819
	TS/TG	0	5
>44	Male	44	58
	Female	260	410
	TS/TG	0	2
Total	Male	244	466
	Female	1129	1316
	TS/TG	0	15
GRANT TOTAL		1373	1797

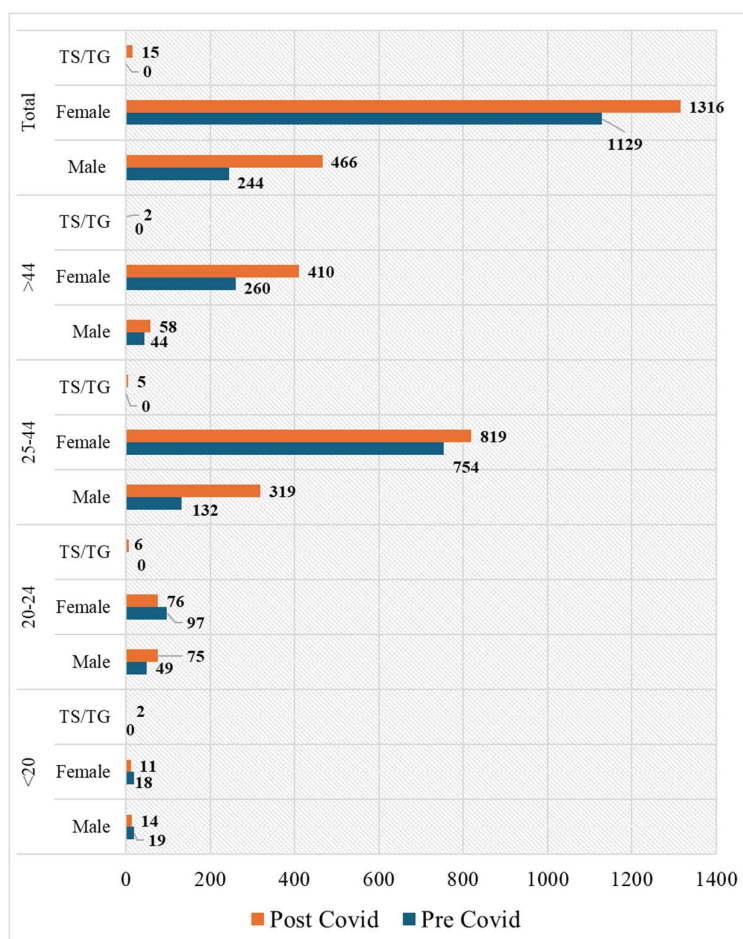


Figure 4- AGE AND GENDER DISTRIBUTION

INFERENCE- A fall in cases in all the 3 gender groups were seen in <20 years age group. In the age group of 20-24 a rise in cases post COVID were seen in all the gender groups of 20-24 except for females. Rest of the age groups a rise in cases were seen post COVID in all gender groups.

Table 5: SYNDROMIC CLASSIFICATION OF CASES

DIAGNOSIS	PRECOVID	POSTCOVID
Vaginal/Cervical discharge	898	1149
Genital ulcer - Non herpetic	12	2
Genital ulcer - Herpetic	94	112
Lower Abdominal Pain	273	116
Urethral discharge	18	63
Ano rectal discharge	5	0
Inguinal Bubo	6	0
Painful scrotal swelling	0	0
Genital warts	50	126
Other STIs	115	57
Serologically positive for syphilis	42	228
GRANT TOTAL	1513	1853

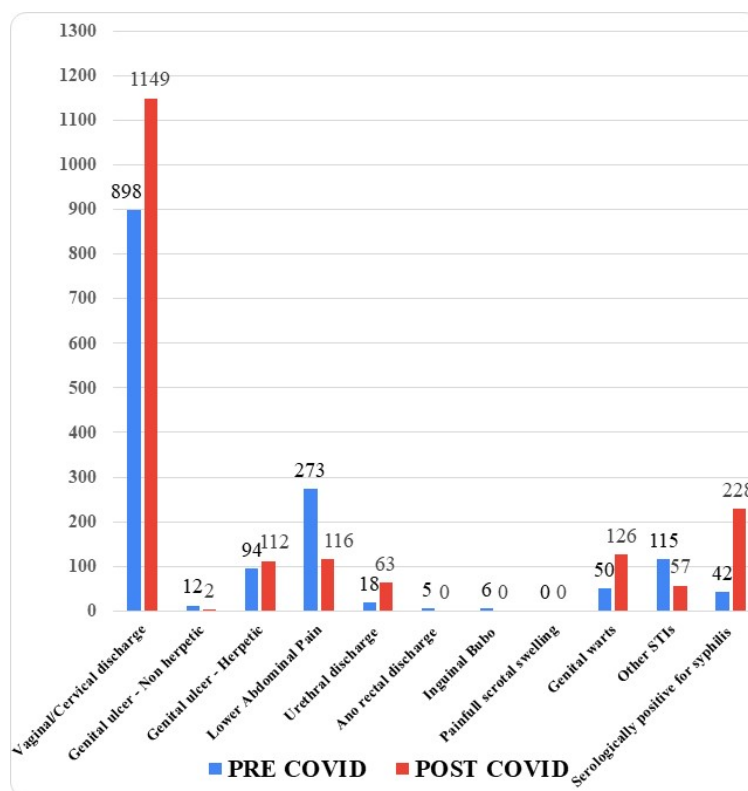


Figure 5: PRE COVID POST COVID

A fall in cases were seen post COVID for Genital ulcer non herpetic, lower abdominal pain, anorectal discharge, inguinal bubo and other STI's. An increase in cases were seen in all the other syndromes. Most number of cases

were seen for vaginal and cervical discharge. The highest percentage increase in post COVID cases were seen for syphilis (442.8%). Among the post COVID syphilis cases 37 had HIV coinfection.

Table 6: Sexual behavioural patterns among 25 randomly selected patients from the study group

		PRECOVID	POSTCOVID	P VALUE
Sexuality	Homosexual	6	13	0.0413
	Heterosexual	19	12	
Condom usage	Yes	10	6	0.2252
	No	15	19	
No of partners	Single	6	9	0.8571
	Multiple	19	16	

INFERENCE- A statistically significant difference was observed in reported sexual orientation between the two periods ($p = 0.0413$). Although condom non-use increased in the post-COVID group, the difference was not statistically significant ($p = 0.2252$).

DISCUSSION

This retrospective study evaluated trends in sexually transmitted infections (STIs) among patients attending a tertiary care STI clinic in Central Kerala during the pre-COVID (2017–2019) and post-COVID (2022–2024) periods. A substantial increase in the total number of STI

cases was observed after the COVID-19 pandemic, with cases increasing from 1,373 in the pre-pandemic period to 1,797 in the post-pandemic period. These findings are consistent with emerging evidence from India and other countries demonstrating a rebound or resurgence of STIs following the relaxation of pandemic-related restrictions and restoration of healthcare services.^{1,3,5,10,12}

The initial decline in STI reporting during the COVID-19 period reported in several studies has been attributed to

lockdown measures, reduced healthcare-seeking behaviour, restricted access to diagnostic services, and diversion of healthcare resources toward pandemic management.^{10,13} However, subsequent increases in STI diagnoses after the pandemic have been widely documented and may reflect a combination of resumed sexual activity, delayed healthcare utilization, increased screening, and ongoing transmission within communities.^{5,7,12}

Females constituted the majority of STI clinic attendees in both study periods, although the proportion of males increased considerably in the post-COVID period. Similar female predominance has been reported in long-term STI trend analyses from Kerala, possibly reflecting greater healthcare contact through reproductive and gynecological services and the high burden of vaginal and cervical discharge syndromes among women.² The emergence of transgender patients in the post-COVID period may indicate improved healthcare accessibility, increased awareness, and greater utilization of STI services by gender-diverse populations.

The most affected age group in both periods was 25–44 years, representing the sexually active and economically productive population. Although a decline was observed among individuals younger than 20 years, STI cases increased across all other age groups after the pandemic. Comparable findings were reported in the Catalanian population-based study, where increases in STI incidence were observed across multiple age categories following the pandemic period.⁵ The mean age of patients in the present study (38.75 ± 17.26 years pre-COVID and 40.73 ± 17.82 years post-COVID) is also comparable to observations from previous studies conducted in Kerala.²

Analysis of syndromic patterns revealed that vaginal/cervical discharge remained the most common STI syndrome in both periods. Significant increases were observed in genital warts, urethral discharge syndrome, herpetic genital ulcer disease, and serologically positive syphilis. Of particular importance was the marked increase in syphilis cases, which rose by 442.8% in the post-COVID period. This finding is in agreement with recent reports from India and internationally that have documented a resurgence of syphilis following the pandemic.^{4,12,15} The increase may be attributable to delayed diagnosis during the pandemic, interruption of routine screening programmes, increased sexual networking after lifting of restrictions, and improved case detection following restoration of healthcare services.¹⁵ Furthermore, the presence of HIV co-infection in a subset of syphilis patients highlights the continuing epidemiological link between these infections and emphasizes the importance of integrated STI and HIV screening strategies.

Conversely, reductions were observed in non-herpetic genital ulcer disease, lower abdominal pain syndrome, anorectal discharge, inguinal bubo, and other STI syndromes. These changes may reflect shifts in pathogen

distribution, healthcare-seeking behaviour, diagnostic practices, or the effectiveness of syndromic management programmes. Similar alterations in STI epidemiology have been described in studies evaluating post-pandemic STI trends.^{5,6}

Assessment of sexual behaviour among the randomly selected subset of patients suggested an increase in self-reported homosexual orientation and a decrease in condom use in the post-COVID period. However, these findings should be interpreted with caution because behavioural analysis was based on a small sample of only 25 individuals from each period. The observed increase may reflect greater willingness to disclose sexual orientation, increasing social acceptance, or changes in healthcare access rather than a true increase in prevalence. Previous international studies have reported increasing openness regarding same-sex relationships and sexual identity across several countries, including India.^{5,9} More importantly, the observed reduction in condom use is a public health concern, as inconsistent condom use remains a major risk factor for STI transmission and may partly explain the increase in STI burden observed in the post-pandemic period.

Overall, the findings of this study support the growing body of evidence indicating that the COVID-19 pandemic has had lasting effects on STI epidemiology. The post-pandemic resurgence of STIs, particularly syphilis, underscores the need for strengthened surveillance systems, early diagnosis, targeted behavioural interventions, and continued public health investment in STI prevention and control.

CONCLUSION

The present study demonstrated a significant increase in STI cases during the post-COVID period compared with the pre-COVID era, indicating a resurgence of sexually transmitted infections following the pandemic. Vaginal/cervical discharge syndrome remained the most common clinical presentation, while serologically positive syphilis showed the greatest proportional increase. The majority of affected individuals belonged to the 25–44-year age group, and females constituted the largest proportion of clinic attendees in both periods.

The observed changes in STI trends are likely multifactorial and may be related to disruptions in healthcare services during the pandemic, delayed diagnosis, restoration of healthcare access, and changes in sexual behaviour after the lifting of restrictions. Although behavioural analysis was limited by the small sample size, reduced condom use among post-COVID patients highlights the continued need for effective sexual health education and risk-reduction strategies.

These findings emphasize the importance of strengthening STI surveillance, expanding access to screening and treatment services, promoting consistent condom use, and integrating STI prevention programmes into routine public health practice. Particular attention should be directed toward the rising burden of syphilis and its association

with HIV infection. Further multicentre prospective studies incorporating detailed behavioural and microbiological data are required to better understand the long-term impact of the COVID-19 pandemic on STI epidemiology.

Strengths:

The study compared STI trends over six years spanning both pre- and post-pandemic periods and included a large clinic-based sample, enabling assessment of changes in epidemiological and syndromic patterns

Limitations:

- Ours was a single tertiary care centre study
- We had collected the data to assess for any changes in sexual behavioural patterns in pre and post covid time, only from 25 patients each in a random manner

RECOMMENDATIONS

- Majority of our STI patients had not used condoms. Hence health education regarding importance of consistent condom use should be promoted among vulnerable sexually active population.

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