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RESEARCH ARTICLE

A CLINICO-EPIDEMIOLOGICAL STUDY OF VIRAL SEXUALLY TRANSMITTED INFECTIONS AT A TERTIARY CARE CENTRE

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Abstract

Sexually transmitted infections (STIs) remain a significant public health concern. Globally, over one million curable STIs are contracted daily by individuals aged 15 to 49,with the majority remaining asympto matic.[1] Historically, during the 1960s and 1970s in India, bacterial STIs such as syphilis, chancroid, and gonorrhea were predominant, while viral STIs such as herpes simplex virus (HSV), human papillomavirus (HPV) and hepatitis B and C were relatively rare. However, since the emergence of HIV in the 1980s, the STI landscape has changed marked ly. There has been a noticeable rise in viral STIs and a concurrent decline in bacterial infections. This shift may be attributed to factors such as asymptomatic nature of many viral STIs leading to their underd iagnosis, improved self-reporting in symptomatic cases, widespread antibiotic usage, the effectiveness of syndromic management and enhanced primary healthcare services.[2] Sexually transmitted infections (STIs) negatively affect sexual and reproductive health, leading to stigmatization, infertility, cancers, pregnancy complications, and an increased susceptibility to HIV.In addition, the emergence of drug resistance poses a significant challenge to global efforts in controlling the burden of STIs.[1,2] Epidemiological research in dermatology is timelessly relevant it helps quantify the burden of these infections, gives insights on changing trends, uncover underlying causes and evaluate prevention and treatment strategies. By providing a rigorous, evidence-based framework, such studies minimize bias and enhance clinical research, ultimately improving patient care and public health outcomes.[3] In view of the above mentioned aspects, the present study was undertaken to assess the trends of viral STIs at a tertiary care center.

Introduction:-

Materials and Methods:-

A retrospective study was conducted on case records of 212 patients who attended the Sexually Transmitted Infections (STI) clinic of Dr. M.K. Shah Medical College and Research Centre over a two-year period, from April 2023 to April 2025. The inclusion criteria comprised patients diagnosed with one or more viral STIs during the study period. Data were collected from patient records and relevant clinical information, laboratory findings, and

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final diagnoses were compiled. The data was analyzed using descriptive statistics. Frequency tables were generated, and graphical representation of trends and distribution patterns was plotted to assess the epidemiological profile of viral STIs among the study population.

Results:-

Of the cases diagnosed as STI, 54.24% had viral etiology. There were more male patients (72.41%) compared to females (27.59%). The minimum and maximum age at presentation were 16 years and 69 years respectively (mean age 42.5 years).The highest numbers of cases(34.48%) were contributed by patients from 20-29 years of age group,with a significant number of both male and female patients.(Table-1)

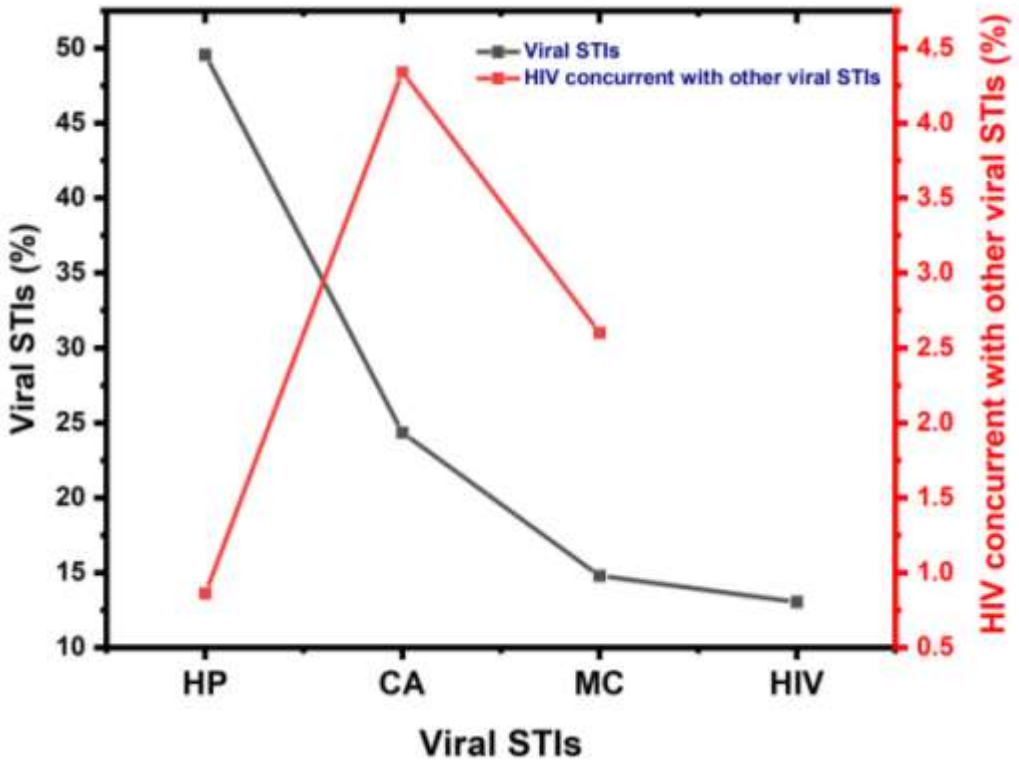
AGE GROUP	Percentage(%)
<20	4.31
20-29	34.48
30-39	30.17
40-49	19.83
>50	11.21

65.52% of the patients were married and 25% patients were unmarried, 9.48% were separated or divorced. 14% of patients showed polygamy, 1.74% male patients were homosexuals, 6.08% were bisexual, 7.14% patients had history of paid exposure. 20.33% patients practiced consistently safe sexual practices, of which majority of the patients were married belonging to mid socioeconomic strata (SES) having single partner. 55% patients had secondary education and 8% patients had professional education. Only 1.74% of the patients were circumcised.
Herpes progenitalis(HP) was the most common viral STI in both males and females,constituting 50% of total viral STIs. The youngest age at presentation was 16 years.It was also the most common viral STI amongst marriedpopulation. 70% of the afflicted patients were males, majority of which were married and belonging to mid-SES. 5.17% had recurrent episodes and 5.2% had atleast one similar episode in the past one year.12.28% patients had a past history of STI other than HP and7.01% had other concurrent viral STI other than HIV at the time of presentation.

Overall,10.34% patients had of positive partner history. 7% of the total female patients reported a positive partner history and notably,all of these individuals were married, in monogamous relationships and presented with their first episode of infection. The common presenting symptoms were pain and burning sensation and the most common site was glans in males and labia majora in females.

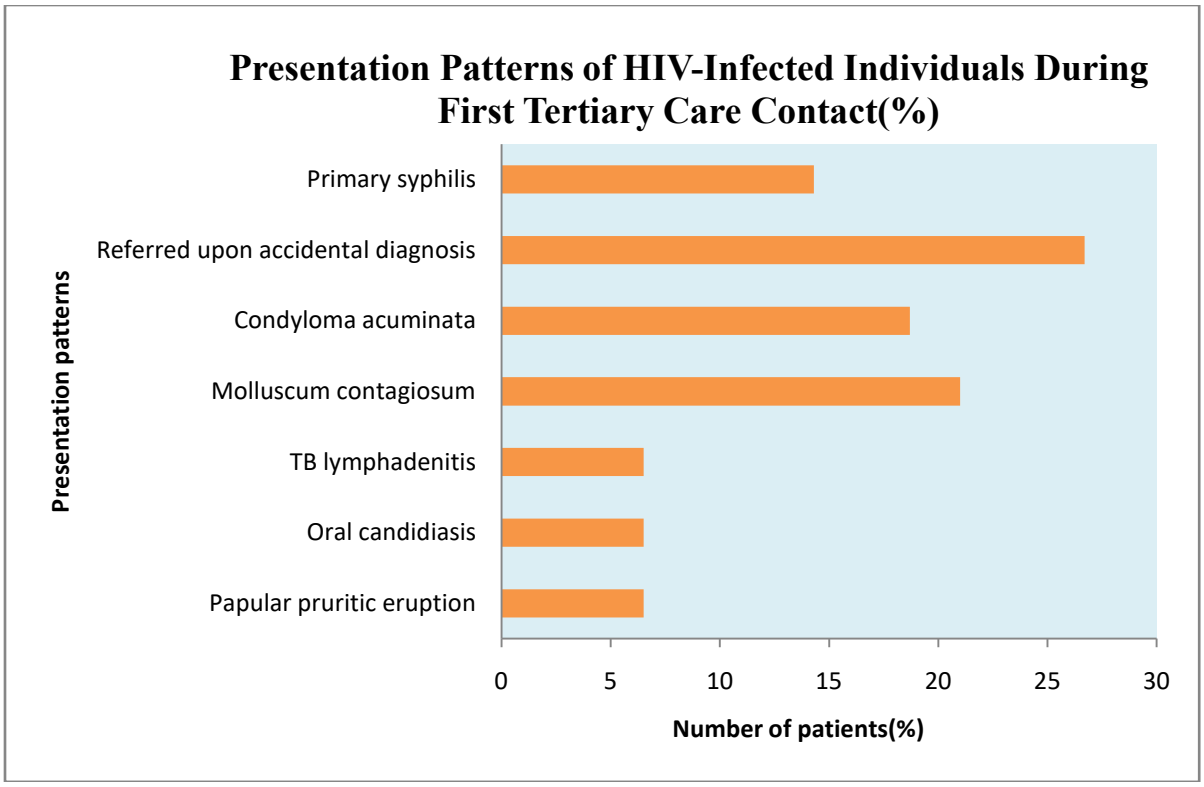
Notably, HSV serology was negative in 3.5% of the patients:-
Among male patients, 5% presented with concurrent candidial balanitis, and one case of cutaneous Crohn's disease was noted. Among female patients, the most prevalent coexisting dermatoses were tinea corporis and candidial intertrigo. Condyloma acuminata emerged as the second most prevalent viral STI, accounting for 24.35% of cases, and was the most frequently associated viral STI among individuals with HIV. Of the condyloma cases, 14.28% occurred in known HIV-positive patients, while 6.67% of HIV-positive individuals reported a past history of condyloma. A marked male predominance (89.28%) was observed, particularly among individuals with a history of paid sexual exposure and HIV seropositivity. In males, the most commonly affected anatomical sites were the coronal sulcus and penile shaft, whereas in females, lesions were primarily localized to the labia majora and vestibule. Perianal involvement was noted in 17.85% of male patients, particularly those with HIV, compared to 3.5% of female patients.

Latent syphilis was co-diagnosed in 10.71% of patients at presentation. Additionally, 40% of female patients reported similar lesions in their sexual partners, indicating potential transmission linkage. Behavioral data revealed that 7.14% of affected individuals identified as homosexual, 7.14% had a history of paid sexual activity, another 7.14% identified as bisexual, and 25% reported having more than one female partner.



Graph: 1 Graph showing distribution of various STIs along with Prevalence of HIV Across Different STIs…OR Spectrum of STIs and Associated HIV Positivity Rates

Among the total cases analyzed, 13.04% were diagnosed with HIV, either as a standalone diagnosis or in combination with other conditions. A male predominance (80%) was observed among HIV-positive cases, with females accounting for only 20%. Low socioeconomic status was a significant factor, with 67% of HIV-positive individuals belonging to this group. A notable 87% had a history of concurrent bacterial or viral STIs, with syphilis being the most common—47% had serological evidence of syphilis, and 14.3% had primary syphilis at diagnosis. Additionally, 26.7% were referred following an incidental HIV diagnosis, of which 50% showed RPR reactivity. Papular pruritic eruption and oral candidiasis were observed in 6.5% of the HIV patients, while 21% had molluscum contagiosum. Additionally, 6.5% of patients exhibited tuberculosis lymphadenitis. Notably, 33.33% of HIV patients had experienced condyloma acuminata at some point in their lives.



Graph 2: graph showing l Presentation Patterns Among HIV-Infected Patients at First Encounter in Tertiary Care OR change title as Presentation Spectrum of HIV at Initial Tertiary Centre Contact and keep the current title as legend.

Regarding the transmission risk in HIV patients- 23% of HIV-positive patients identified as homosexual, 8% as bisexual, and 21% were females with partners who had multiple sexual exposures. The remainder were predominantly males reporting paid sexual encounters and multiple partners. In those with warts and molluscum contagiosum, HIV-positive status was associated with clinically significant differences in lesion size, number, and extragenital involvement. Atypical manifestations, such as giant lesions, were observed in 13.3% of seropositive individuals.(Fig.1,2-a,b,c)

Fig. 4: Condyloma accuminata over the anal and peri-anal region in a 38 year old sero-positive male.
Fig. 5 : (a)Gaint molluscum in a 30 year old sero-positive male ;Fig.5 (b) and 5(c) shows extracted molluscum body

Among viral STIs, HPV-related lesions were most commonly associated with HIV, followed by syphilis. Papular pruritic eruption was the most common cutaneous manifestation in HIV-positive individuals, while oral candidiasis was the predominant mucosal finding.

Among patients diagnosed with viral STIs, approximately 1.74% tested positive for HBsAg. Both of these individuals were also HIV-positive with one of them having concurrent herpes progenitalis and latent syphilis.
Molluscum contagiosum was observed in 15% of all viral STI cases, with the majority occurring in unmarried males who had unsafe exposure to multiple female partners, one-third of whom reported paid exposure. 6% of patients had concomitant HIV infection, and 6% presented with herpes progenitalis. Extragenital molluscum was noted in 18% of cases, while 24% showed HIV reactivity.. A history of paid sexual exposure was found in 7.14% of

cases, all of which were male, with condyloma acuminata being the most common diagnosis, followed by molluscum contagiosum.

Discussion:-

The genital region's warm and moist environment creates ideal conditions for the proliferation of various microorganisms, including viruses, bacteria, and yeast. Sexually transmitted infections (STIs) remain a major public health concern, contributing substantially to psychosocial and economic burdens—especially among young, sexually active populations.[4] The highest numbers of cases(34.48%) were contributed by patients from 20-29 years of age group which was similar to the study done by Jain et. Al, Vora et.al and Chauhan M. et al.[5,6,7] This higher prevalence of STIs among young individuals is largely attributed to increased sexual activity, consistent with findings from previous epidemiological studies.

While males accounted for the majority of reported cases- this may reflect disparities in healthcare-seeking behavior rather than actual disease burden. Female patients were underrepresented, likely due to multiple intersecting barriers. These include embarrassment or stigma associated with seeking STI care, reliance on indigenous or regional treatment practices, limited awareness of STI symptoms—especially as many viral infections remain asymptomatic in women—and poor accessibility to appropriate healthcare services. Additionally, some women may prefer seeking care through gynecological channels, further contributing to underreporting in general STI clinics.[5] Most of them were married about 65.52% contrary to the study done by Saikia et al where 55.5% of them were married indicating higher incidence of pre-marital exposure compared to our study.[8]

Of all patients attending the STI clinic, viral STI showed predominance which was similar to the study done by Vora et. Al where Viral infections accounted for 62.2% of cases.[6] Genital ulcer diseases (GUDs), particularly those caused by herpes simplex virus type 2 (HSV-2), are more common than bacterial STIs due to the persistent and recurrent nature of viral infections. Unlike bacterial ulcers, which are typically curable and declining due to antibiotic use and public health measures, HSV-2 remains lifelong and can reactivate periodically, leading to recurrent lesions and sustained transmission.[9,10,11]

In this study,8.7% of the patients had two or more concurrent viral STI at the time of presentation and 87% of the patients with HIV had history of concurrent bacterial or viral STI. This can be attributed to the fact that GUDs heighten the risk of HIV transmission by disrupting the epithelial barrier, allowing direct viral entry. These ulcers also recruit immune cells such as macrophages and T-cells, which serve as targets for HIV. Additionally, the inflammatory response triggered by treponemal lipoproteins enhances cytokine production, creating a microenvironment that facilitates HIV acquisition.[12]

Majority of the affected females in this study had a male partner with history of unsafe exposure analogous to the study done by Narayan B. et al. This finding shows that major source of infection for female patients was their male partner while premarital and extramarital exposures were sources for males.[13] Interestingly, 7% of the total female patientsof HP were those who presented with first episode of infection-were married and in monogamous relationships and without any prior sexual contact. 21% of all HIV cases were females with partners who had multiple sexual exposures. A study done by PanchanadeswaranS et al suggests that men were much more likely than women to have more than one lifetime sexual partners, and to have concurrent regular and casual partner. However, a study done by Holmberg et al states that despite measures to conduct interviews in private cubiclesto ensure confidentiality, there is also the possibility that women under-reported their number of sexual partners owing to social desirability bias.[14]

Unlike bacterial STIs, HSV-2 is predominantly transmitted within long-term couples rather than high-risk groups, contributing to its sustained high seroprevalence. Studies indicate a median transmission time of three months in serodiscordant couples, with an average of 24 sexual acts before transmission. Annual seroconversion rates among negative partners range from 3% to 12%. Virus replication and reactivation occurs from time to time in various asymptomatic persons who have been infected at some point in their lifetime.[15]This is further potentiated in groups having lowest quintiles of age at sexual debut as the probability of number sexual exposures and casual partners is more in such patients and hence the proportion of patients with latent infections increases.[13]Therefore, physicians should target serodiscordant couples for interventions that decrease the likelihood of transmission. [16]

HSV-2 seropositivity is strongly associated with increased susceptibility to HIV-1 acquisition and transmission. This is largely due to the recruitment of activated CD4+ T lymphocytes to herpetic lesions, which serve as preferential target cells for HIV-1 entry and replication. It is not known whether antiviral suppression in HSV-2–seropositive patients can reduce transmission of HIV, but this area deserves more attention.[14]

In this study, 3.5% of patients tested negative for HSV antibodies, but this may not reflect true absence of infection. HSV serology tests have only about 70% sensitivity and specificity, meaning they can miss or misidentify infections in up to 37% of cases. One reason for this is an immune system phenomenon called the anamnestic response. **I**f a patient has had HSV-1 in the past, their body may reactivate that immune memory when exposed to HSV-2, and produce antibodies in response to HSV-1 thus masking the new infection and making the new HSV-2 antibodies harder to detect.This immune "confusion" is called an anamnestic response. Thus, the tests were often unable to detect antibodies to HSV-2 in patients with antibodies to both viral sub-types as the seroconversion to HSV-2 is masked by amamnestic response to type common antigens.[17]

Condyloma accuminata (CA) lesions contain higher concentrations of HIV-susceptible cells(CD4+ cells), suggesting a role in facilitating HIV transmission.CA lesions are rich in HIV target cells and exhibit increased vascularity and friability, potentially facilitating HIV transmission during sexual contact.[18] Conversely, HIV-induced immunosuppression hampers the body's ability to clear human papillomavirus (HPV) infections, particularly low-risk types 6 and 11 responsible for CA. This leads to more extensive, recurrent, and treatment-resistant warts in HIV-positive patients.This is partly due to the inability to eliminate latent HPV infections in surrounding tissues.[19] Thus, CA increases the susceptibility of contracting HIV and HIV decreases the body's ability to eliminiate CA. This explains the strong correlation observed in this study between HIV and CA.

Perianal involvement in CA was noted in 17.85% of male patients, particularly those with HIV, compared to 3.5% of female patients. During sexual intercourse, close physical contact and friction between the skin and mucosal surfaces—particularly in the genital, pubic, inguinal, and lower abdominal regions—create a conducive environment for the transmission of molluscum contagiosum (MC). The virus may gain entry through microabrasions or minor disruptions in the epidermis that frequently occur in these areas due to mechanical stress. Importantly, the transmission of MC is not limited to penetrative intercourse. As the virus spreads via direct skin-to-skin contact, its transmission can occur even with the use of barrier protection such as condoms. [20]

While condom use has traditionally been the cornerstone of STI prevention among men who have sex with men (MSM), maintaining consistent usage has proven difficult in this group. Beginning in the 1990s, MSM increasingly turned to alternative risk-reduction strategies—such as serosorting (partner selection based on HIV status) and seropositioning (choosing sexual roles based on HIV status. The mid-1990s marked a turning point, with the advent of effective antiretroviral therapy (ART) improving HIV prognosis and reduced perceived urgency around condom use. This trend intensified in the 2010s with the emergence of biomedical interventions like treatment as pre-exposure prophylaxis (PrEP). These were adapted as alternatives to condom use instead of its intended implication which was meant to be an adjunct to conventional barrier contraception. Thus, misuse and misperception of these alternative approaches might have contributed to an increase in HIV cases in certain groups. [21]

Vaccination plays a pivotal role in the prevention and control of infectious diseases, including sexually transmitted infections (STIs). Currently, effective vaccines are available for Hepatitis B virus (HBV) and Human Papillomavirus (HPV), while vaccine development for other STIs remains an area of active research. The HBV vaccine, introduced in the early 1980s, was initially targeted at high-risk populations such as men who have sex with men (MSM) but has since been incorporated into routine infant immunization schedules in over 95% of countries. The HPV vaccine, launched in 2006 for females aged 9 to 45 years, was extended to include males in 2011. Despite its availability, unequal access and varied uptake across different economic settings continue to pose significant barriers to global implementation.[22]

Conclusion:-

STIs, particularly HIV, have major economical and psychological impacts, including higher rates of depression, anxiety, and PTSD, especially among adolescents. Social stigma whether experienced, perceived, or internalized—worsens this burden by reducing support and quality of life. Changing trends in STI prevalence and transmission highlight the need for continual surveillance as well as advancements and accessibility in terms of diagnostic

approaches. Monitoring these patterns is essential not only for timely intervention but also for informed policy development and the implementation of effective public health strategies to control STI spread.

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