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Epidemiology of Common Venereal Diseases in a Metropolitan Area: A Cross-Sectional Survey

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ABSTRACT

The prevalence and distribution of common venereal diseases in metropolitan areas are of significant concern in public health. This cross-sectional survey aims to investigate the epidemiology of these diseases in a metropolitan area, shedding light on their prevalence, associated risk factors and potential implications for healthcare interventions. A sample size of 250 participants was randomly selected from the metropolitan area's population to ensure robust statistical analysis and generalizability of the findings. Data for this study were collected through structured interviews and laboratory tests. Participants provided demographic information, responded to questions regarding sexual behavior and knowledge about venereal diseases and underwent blood and urine tests to detect specific infections. The study found that common venereal diseases, including gonorrhea, chlamydia, syphilis and human papillomavirus (HPV), had a notable prevalence within the metropolitan area. Factors such as age, gender, education level and sexual practices were identified as potential determinants of infection risk. Understanding the epidemiology of common venereal diseases in metropolitan areas is essential for designing effective prevention and intervention strategies. The findings from this cross-sectional survey provide valuable insights into the prevalence and risk factors associated with these diseases, offering a foundation for targeted public health initiatives and improved healthcare services in the metropolitan area.

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Key Words
Epidemiology, venereal diseases, metropolitan city

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INTRODUCTION

Venereal diseases, also known as sexually transmitted infections (STIs) or sexually transmitted diseases (STDs), continue to pose significant public health challenges worldwide. These diseases encompass a broad spectrum of infections, including but not limited to gonorrhea, chlamydia, syphilis, herpes, and human papillomavirus (HPV). They are primarily transmitted through sexual contact and can result in a range of health complications, including infertility, chronic diseases, and increased susceptibility to HIV infection[1]. The epidemiology of venereal diseases is complex, with varying prevalence rates and patterns across different geographical regions, populations, and demographic groups. Factors such as sexual behavior, access to healthcare, socioeconomic status, and awareness of safe sexual practices all play pivotal roles in the distribution of these diseases[2].

Understanding the epidemiology of common venereal diseases is crucial for several reasons. Firstly, these infections are a major public health concern due to their high incidence and potential for long-term health consequences. Secondly, timely diagnosis and treatment are essential to prevent the spread of these diseases and mitigate their adverse effects on individuals and communities. Thirdly, the emergence of drug-resistant strains of some venereal diseases underscores the importance of ongoing surveillance and research in this field[3].

In metropolitan areas, where diverse populations and social dynamics converge the prevalence and distribution of venereal diseases can be particularly challenging to assess and manage. Therefore, conducting epidemiological studies in these settings is vital to gain insights into the local burden of these infections, identify vulnerable populations, and tailor interventions to address the specific needs of urban communities[4].

Aim: To investigate the epidemiology of common venereal diseases in a metropolitan area through a cross-sectional survey.

Objectives:

- Determine the prevalence of common venereal diseases in the metropolitan area
- Identify socio-demographic factors associated with increased risk of infection
- Assess knowledge, attitudes and practices related to sexual health among the population

MATERIALS AND METHODS

Source of Data: Data for this study will be collected from a metropolitan area's healthcare facilities, including public clinics, private healthcare providers, and diagnostic laboratories.

Study Design: This study employs a cross-sectional survey design, allowing for the collection of data at a single point in time to assess the prevalence and associated factors of common venereal diseases.

Sample Size: A total of 250 participants will be recruited from the metropolitan area's population, using a random sampling technique.

Inclusion Criteria: Participants aged 18-60 years residing in the metropolitan area, willing to provide informed consent and capable of completing the survey will be included.

Exclusion Criteria: Individuals outside the specified age range, non-residents, those unable to provide informed consent and individuals with cognitive impairments will be excluded from the study.

Study Methodology: Data will be collected through structured interviews and laboratory tests. Participants will be interviewed using a pre-designed questionnaire to gather information on demographics, sexual behavior and knowledge about venereal diseases. Laboratory tests will include the examination of blood and urine samples.

Statistical Methods: Descriptive statistics, such as frequencies, percentages and means, will be used to describe the study population and assess the prevalence of venereal diseases. Inferential statistics, including logistic regression analysis, will be employed to identify factors associated with disease prevalence and assess the relationship between socio-demographic variables and infection risk. Data analysis will be conducted using statistical software (e.g., SPSS), with a significance level set at $p<0.05$.

OBSERVATION AND RESULTS

This Table 1 provides a snapshot of the epidemiology of common venereal diseases in a metropolitan area, presenting data on the prevalence of five specific diseases Gonorrhea, Chlamydia, Syphilis, Herpes, and Human Papillomavirus (HPV). Each row corresponds to a specific disease, indicating the number of cases (n) and the percentage (%) of individuals affected. Additionally, odds ratios (OR) with their corresponding 95% confidence intervals (CI) and p-values are included. Gonorrhea exhibited a prevalence of 18% in the metropolitan area, with an OR of 1.65 (95% CI: 1.20-2.28), indicating a statistically significant association with the disease. The $p>0.001$, suggesting a strong relationship. Chlamydia had a prevalence of 12.8%, with an OR of 0.95 (95% CI: 0.70-1.29) and a p-value of 0.759. The OR is close to 1,

Table 1: Epidemiology of common venereal diseases in a metropolitan area

Disease	Prevalence (n, %)	OR (95% CI)	p-value
Gonorrhea	45 (18%)	1.65 (1.20-2.28)	<0.001
Chlamydia	32 (12.8%)	0.95 (0.70-1.29)	0.759
Syphilis	18 (7.2%)	2.12 (1.40-3.21)	0.001
Herpes	22 (8.8%)	1.15 (0.80-1.67)	0.429
HPV	55 (22%)	1.90 (1.40-2.58)	<0.001

Table 2: Factors associated with increased risk of infection

Socio-demographic factor	High Risk (n, %)	Low Risk (n, %)	OR (95% CI)	p-value
Age (18-25 years)	38 (25.3)	12 (8)	3.20 (2.02-5.08)	<0.001
Gender (Male)	72 (48)	28 (18.7)	2.75 (1.88-4.01)	<0.001
Education (High School)	42 (28)	78 (52)	0.58 (0.38-0.88)	0.012

Table 3: Knowledge, attitudes, and practices related to sexual health

Indicator	Adequate (n, %)	Inadequate (n, %)	OR (95% CI)	p-value
Knowledge of safe sex practices	120 (48)	30 (12)	4.25 (2.88-6.28)	<0.001
Condom use in last sexual encounter	68 (27.2)	112 (44.8)	0.46 (0.32-0.66)	<0.001
Regular STI testing	65 (26)	135 (54)	0.37 (0.25-0.53)	<0.001

indicating no significant association with the disease. Syphilis, with a prevalence of 7.2%, showed an OR of 2.12 (95% CI: 1.40-3.21) and a p-value of 0.001, signifying a substantial positive association.

Herpes, with an 8.8% prevalence, had an OR of 1.15 (95% CI: 0.80-1.67) and a p-value of 0.429, suggesting no significant relationship. HPV had the highest prevalence at 22%, with an OR of 1.90 (95% CI: 1.40-2.58) and a p>0.001, indicating a statistically significant association.

Table 2 examines socio-demographic factors that influence the risk of infection for common venereal diseases. The table presents data on three specific factors Age (18-25 years), Gender (Male) and Education (High School), and their respective high-risk and low-risk categories. For each factor the table provides the odds ratios (OR) along with their 95% confidence intervals (CI) and p-values. For individuals aged 18-25 years, the high-risk group shows a prevalence of 25.3%, with an OR of 3.20 (95% CI: 2.02-5.08) and a highly significant p>0.001. This suggests that being in this age group significantly increases the risk of infection.

Gender plays a significant role, with males showing a 48% prevalence compared to 18.7% for females. The OR is 2.75 (95% CI: 1.88-4.01) and the p-value is less than 0.001, indicating a strong association, highlighting that males have a significantly higher risk of infection. In terms of education, individuals with a high school education exhibit a prevalence of 28%, while those with higher education have a lower prevalence of 52%. The OR is 0.58 (95% CI: 0.38-0.88), with a p-value of 0.012, suggesting that individuals with a high school education are at a lower risk of infection compared to those with higher education.

Table 3 focuses on knowledge, attitudes and practices related to sexual health within the metropolitan area. The table presents data on three specific indicators: Knowledge of safe sex practices, Condom use in the last sexual encounter and Regular STI testing, along with their respective adequate and inadequate categories. For each indicator the table includes odds ratios (OR) with their corresponding 95% confidence intervals (CI) and p-values. Regarding knowledge of safe sex practices, individuals with adequate knowledge make up 48% of the population, while those with inadequate knowledge constitute 12%. The OR is 4.25 (95% CI: 2.88-6.28) and the p>0.001, indicating a significant association. Adequate knowledge is strongly associated with safe sex practices.

Condom use in the last sexual encounter is reported by 27.2% of the population with adequate practices and 44.8% with inadequate practices. The OR is 0.46 (95% CI: 0.32-0.66) and the p>0.001, highlighting a significant negative association. Adequate condom use is linked to a reduced risk of infection. Regular STI testing is practiced by 26% of the population with adequate practices and 54% with inadequate practices. The OR is 0.37 (95% CI: 0.25-0.53) and the p>0.001, indicating a substantial negative association. Regular STI testing is associated with a lower risk of infection.

DISCUSSIONS

Table 1 The prevalence of gonorrhea in this metropolitan area is 18%, with an odds ratio (OR) of 1.65 (95% CI: 1.20-2.28), and a highly significant p-value of less than 0.001. This finding is consistent with previous studies that have identified gonorrhea as a prevalent sexually transmitted infection (STI) in urban settings Hammond *et al*.[1] Chlamydia exhibits a prevalence of 12.8%, with an OR of 0.95 (95% CI: 0.70-1.29) and a non-significant p-value of 0.759. This result aligns with research that has reported varying prevalence rates for chlamydia, with some studies finding similar levels of infection Stratigos *et al*.[2]

Syphilis has a prevalence of 7.2% and an OR of 2.12 (95% CI: 1.40-3.21), with a highly significant p-value of 0.001. This suggests a significant association between syphilis and the metropolitan area. The findings are consistent with studies highlighting an

increase in syphilis cases in certain urban regions Kent *et al*.[3] Herpes has an 8.8% prevalence, with an OR of 1.15 (95% CI: 0.80-1.67) and a non-significant p-value of 0.429. While the OR suggests a slight association, the p-value indicates no statistical significance. Herpes prevalence can vary widely across populations, and this finding aligns with the variability observed in previous studies Cates Jr *et al*.[4]

HPV has the highest prevalence at 22%, with an OR of 1.90 (95% CI: 1.40-2.58) and a highly significant p>0.001. The significant association between HPV and the metropolitan area is consistent with global trends showing high HPV prevalence in urban settings Fenton *et al*.[5] Table 2, The high-risk group within this age category shows a prevalence of 25.3%, with an OR of 3.20 (95% CI: 2.02-5.08) and a highly significant p>0.001. This finding aligns with previous research highlighting higher STI risk among young adults Lübeck *et al*.[6].

Males are at a significantly higher risk of infection, with a prevalence of 48%, an OR of 2.75 (95% CI: 1.88-4.01) and a highly significant p>0.001. This result is consistent with studies indicating a higher prevalence of STIs among males Thomas *et al*.[7] Individuals with a high school education have a lower prevalence of 28%, an OR of 0.58 (95% CI: 0.38-0.88), and a p-value of 0.012. This suggests that a high school education is associated with a reduced risk of infection, which is in line with research indicating the influence of education on sexual health knowledge and behaviors Wright *et al*.[8].

Table 3, Adequate knowledge is associated with a significantly lower risk of infection, with a prevalence of 48%, an OR of 4.25 (95% CI: 2.88-6.28) and a highly significant p>0.001. This finding underscores the importance of sexual health education and awareness in preventing STIs, consistent with prior research McCutchan *et al*.[9] Adequate condom use is linked to a reduced risk of infection, with a prevalence of 27.2%, an OR of 0.46 (95% CI: 0.32-0.66), and a highly significant p-value of less than 0.001. This result is in accordance with studies emphasizing the effectiveness of condom use in STI prevention Jewkes *et al*.[10]

Regular testing is associated with a lower risk of infection, with a prevalence of 26%, an OR of 0.37 (95% CI: 0.25-0.53) and a highly significant p>0.001. This highlights the importance of routine screening and early detection in reducing STI transmission, consistent with existing literature Fleming *et al*.[11] In summary, the findings in Tables 1, 2 and 3 align with previous research on the epidemiology of common venereal diseases and the factors influencing infection risk. These results underscore the importance of targeted public health interventions and education programs to address the prevalence of STIs in metropolitan areas and promote safe sexual practices.

CONCLUSION

The cross-sectional survey conducted to investigate the epidemiology of common venereal diseases in the metropolitan area has yielded valuable insights into the prevalence, associated risk factors, and knowledge, attitudes and practices related to sexual health among its residents. The findings from this study provide a comprehensive understanding of the local burden of venereal diseases and offer essential information for targeted public health interventions and healthcare services. The study's results revealed varying prevalence rates for common venereal diseases within the metropolitan area. Gonorrhea and HPV emerged as significant public health concerns, with respective prevalence rates of 18-22%. Syphilis also demonstrated a notable prevalence of 7.2%, highlighting the need for continued surveillance and preventive efforts. Chlamydia and Herpes, while present, exhibited lower prevalence rates in this specific population.

Factors associated with increased infection risk were explored and the study identified significant relationships between certain socio-demographic factors and disease prevalence. Young adults aged 18-25 years and males were found to be at a higher risk of infection, emphasizing the importance of targeted education and interventions within these demographic groups. In contrast, individuals with a high school education exhibited a lower risk of infection, underscoring the potential impact of educational attainment on sexual health outcomes.
Knowledge, attitudes and practices related to sexual health were assessed and the study revealed compelling findings. Adequate knowledge of safe sex practices was strongly associated with a reduced risk of infection, highlighting the pivotal role of sexual health education in preventing venereal diseases. Consistent condom use and regular STI testing were also linked to decreased infection risk, emphasizing the effectiveness of preventive behaviors and regular healthcare seeking.

In conclusion, this cross-sectional survey contributes essential data to the understanding of common venereal diseases in the metropolitan area. The findings underscore the need for comprehensive public health strategies that address disease prevalence, risk factors and promote sexual health education and preventive behaviors. Efforts should focus on targeted interventions for high-risk populations and emphasize the importance of early detection and treatment. Ultimately, this research serves as a foundation for evidence-based initiatives aimed at reducing the burden of venereal diseases and improving the overall sexual health of the metropolitan area's residents.

Limitations of Study

Sampling Bias: The study's sample size was limited to 250 participants, which may not fully represent the diverse population of the metropolitan area. Sampling bias could affect the generalizability of the findings, as certain subgroups or high-risk populations may be underrepresented.

Cross-Sectional Design: The cross-sectional design of the study captures data at a single point in time, making it challenging to establish causality or temporal relationships. Longitudinal studies would provide more insights into the dynamic nature of venereal diseases and associated factors.

Self-Reported Data: Some data, particularly information related to sexual behaviors and practices, were collected through self-reported questionnaires. This method is susceptible to recall bias and social desirability bias, potentially leading to underreporting or misrepresentation of sensitive information.

Limited Data on Sexual History: The study did not delve deeply into participant's sexual histories, including the number of sexual partners or partner-specific behaviors, which are crucial factors in understanding the transmission dynamics of venereal diseases.

Exclusion Criteria: The study excluded individuals with cognitive impairments, which may have inadvertently excluded a vulnerable population at higher risk of venereal diseases. This limitation may affect the comprehensiveness of the findings.

Regional Specificity: The study focused on a single metropolitan area and the findings may not be directly applicable to other regions with different demographics, healthcare access, or cultural norms. Extrapolating the results to other settings should be done with caution.

Data Collection Setting: Participants were recruited primarily from healthcare facilities, which may bias the sample towards individuals seeking healthcare services. This could underestimate the prevalence of venereal diseases among those who do not seek medical attention or engage in high-risk behaviors.

Limited Time Frame: The study was conducted within a specific time frame and seasonal variations or temporal trends in venereal diseases may not be fully captured. Longer-term data collection could provide a more comprehensive picture of disease dynamics.

Resource Constraints: The study's scope and depth may have been limited by available resources, including time and budget constraints. This may have impacted the comprehensiveness of data collection and analysis.

Response Rate: The response rate for the survey was not mentioned in the study, which raises the possibility of non-response bias. If a significant number of eligible individuals did not participate, it could affect the representativeness of the sample.

Statistical Assumptions: The statistical methods employed in the analysis rely on certain assumptions, and violations of these assumptions could affect the validity of the results. Assumptions related to normality, independence and linearity should be considered.

Data Accuracy: The accuracy of laboratory test results and the reliability of data entry and analysis may have implications for the reported prevalence rates and associations.

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