

Clinico-Epidemiological Profile of Patients Attending the Sexually Transmitted Disease Clinics at Tripoli Central Hospital and Beer Usta Milad Hospital

Haneen Almagouz^{ID}, Halima El-Megei^{*ID}

Dermatology Department, Tripoli Central Hospital, Tripoli, Libya

Email. Hamegei@gmail.com

Abstract

Venereal diseases: historically used to refer to infections that are transmitted sexually, like condyloma acuminata, syphilis, herpes, gonorrhea, molluscum contagiosum, and HIV. These disorders are now referred to as sexually transmitted diseases (STDs) or sexually transmitted infections; terms that directly reflect recognition that they are caused mainly by sexual contact with an infected person. A retrospective case series study was conducted using the medical records of all STD patients who attended the STD clinic in Tripoli Central Hospital and Beer-Usta Milad Hospital during the time period from 2010 to 2020. The data were collected and analyzed using the SPSS program version 21. A series of 333 patients was studied and demonstrate that 122 (36.6%) of patients were males while 211 (63.4%) females with ratio of (1:1.73); On assessing their ages, the youngest age was 2 years and the oldest was 70 years old with the mean age of 33.47 ± 11.32 , most of the patients were Libyan (88.9%) and (11.1%) were non Libyan, the most frequent diagnosis was genital warts (84.68%) followed by syphilis (11.41%), Gonorrhea (1.20%), Molluscum Contagiosum (0.6%) then Herpes Genitals (0.6%), only (1.2%) were homosexual, (9.01%) of the patients had more than one sexual partner, (6.31%) were confirmed to have HIV infection, (1.5%) were drug abusers and only (10.51%) gave history of using condom. In our study, we concluded that STDs are common in the young adults' group between 21 and 30 years (42%), with female predominance 63.4% and most of our patients are heterosexual, having only one partner. Genital warts are recognized to be the most common diagnosis (84.68%), followed by syphilis (11.41%), and syphilis X is identified to be more frequent among non-Libyans. We recommend doing more studies with a large sample size from different geographical areas in Libya to assess the true burden of STDs and ensure a good survey leading to better diagnosis and adequate treatment of STDs.

Keywords. Sexually Transmitted, HPV, Syphilis, Condyloma.

Introduction

Sexually transmitted diseases (STDs) are infections that are passed from one person to another by sexual contact. Affect both males and females, with more complications in females. Approximately 20 different infections are transmitted through sexual contact. Many of these are curable by appropriate treatment; however, in spite of the availability of effective treatment, bacterial STDs are still a major public health concern in developing countries [1]. The term sexually transmitted diseases is more easily incorporated to many of the newly discovered sexually transmitted agents and syndromes [2,3]. However, Sexually Transmitted Infections (STIs) and STD terms are synonymously used for all practical purposes. The STIs include infections resulting in clinical diseases that may involve the genitalia and other parts of the body participating in sexual interaction, e.g., bacterial infections like syphilis, gonorrhea, Chancroid, nongonococcal Urethritis, viral like genital warts, genital herpes, Fungal like candidiasis, and parasitic like pediculosis pubis, etc. STIs, in addition, include STDs and infections that may not cause clinical disease of the genitals but are transmitted by sexual interaction, e.g., Hepatitis B, Human Immunodeficiency virus (HIV) [4].

Epidemiological profile varies from one country to another and from one region to another. As the burden of STIs had raised over worldwide particularly in [5,6] developed countries, the WHO implant global strategy approach to reduce and control the disease spread, this approach currently guided by the "Global health sector strategy on sexually transmitted infections, 2016 -2021, adopted by the World Health Assembly in 2016 and the 2015 United Nations Global Strategy for Women's, Children's and Adolescents' Health, which highlight the need for STIs [7,8] a comprehensive, integrated package of essential interventions, including information and services for the prevention of HIV and other sexually transmitted infections. Several studies indicated the rising prevalence of STIs; this rising indicate poor awareness and weak adolescent and youth health services [9,10]. The most common diseases in our Country are: Condyloma acuminatum (genital warts): refers to the skin manifestation attributed to the epidermotropic human papillomavirus (HPV).

Genital warts (GW) typically present on the moist tissues of the anogenital area, although they may occasionally develop in the mouth or the throat after oral sexual contact. GW have a highly variable appearance, which may be flat, dome-shaped, cauliflower-shaped, or pedunculated [11]. GW can be diagnosed with clinical examination. Biopsy is rarely needed to confirm the diagnosis; it is often needed for lesions suspected of malignancy. Both low-risk 2 [subtypes 6 and 11] and high-risk [subtypes 16 and 18] HPV subtypes have been associated with squamous cell carcinoma known as verrucous carcinoma [12]. Penile cancer in men is 10 times less common than cervical cancer in women. STIs include gonorrhea, which is a purulent infection of mucous membrane surfaces caused by *Neisseria Gonococcal* gram-negative bacterium. Spread by sexual contact or through transmission during childbirth [13]. Globally, gonococcal infections are now an urgent problem because *N.gonorrhoeae* is capable of rapidly developing resistance to multiple antibiotic classes [14]. It is often asymptomatic in females and symptomatic in males [15]. The clinical presentation in females includes

vaginal discharge, dysuria, dyspareunia, abnormal uterine bleeding, lower abdominal and /or rectal pain [16]; in males, symptoms include profuse urethral discharge and/or itch, dysuria, and testicular or rectal pain [17]. The most common sites are the urethra and cervix.

Gonococcal infections are considered uncomplicated in the absence of bacteremia or pathogen spread to extra genital sites [18]. Genital Herpes (GH) is another common STI; WHO estimated that more than 500 million people are estimated to have genital infection with herpes simplex virus (HSV) worldwide. The Herpes simplex virus (HSV) is a DNA virus. HSV has subtypes (HSV-1) and (HSV-2). HSV-1 infections were mainly associated with the oral area, causing herpes labialis, whereas HSV-2 infection occurred in the genital region. However, because of increasing oral-genital contact, either HSV type may be found in either location. Genital herpes is an important public health disease and is the leading cause of genital ulcers worldwide [19]. The other viral STI is Molluscum Contagiosum (M.C); MC virus is a member of the Poxviridae family. In adults, MC is most commonly a sexually transmitted infection (STI) with an incubation period usually 2-7 weeks. MC virus causes characteristic skin lesions consisting of a single or multiple lesions with central umbilication. In healthy patients, MC is self-limited after a few months.

Human immunodeficiency virus (HIV) can be transmitted by sexual intercourse; by sharing syringes; and also by pregnancy, childbirth, or breast-feeding. Many people who are living with HIV have no obvious signs and symptoms at all [20]. Recent evidence shows that between 70% and 90% of people who become infected with HIV experience flu-like symptoms within a few weeks after infection [21]. HIV infection may occur as a co-infection with other STDs, mainly with ulcerated lesions from an infected person. The most important Bacterial STI is Syphilis (Lues disease). Syphilis is worldwide and particularly problematic in low-income countries, where it is a cause of genital ulcer disease. Syphilis is a sexually transmitted disease (STD) caused by the bacterium *Treponema Pallidum* spirochetes. Also vertically transmitted during pregnancy. Acquired syphilis is classified into 4 stages: Primary, secondary, latent, and tertiary. Congenital syphilis is divided into early (first two years of life). Late congenital syphilis (after two years). Prevention and control: STIs can be prevented by behavioral interventions and increased awareness. Education on STIs can be done at home, school, and in hospitals. But education alone is not the panacea for STIs, as it may not lead to behavioral changes that reduce the risk of STIs; primary prevention by avoiding exposure and preventing the infection, encouraging consistent condom use, and development and implementation of appropriate vaccination approaches, secondary prevention by early detection, screening, and treatment, and tertiary prevention, which entails the minimization of STIs' sequelae, are required. Therefore, the WHO has implemented preventive strategy programs to reduce the burden of STDs. This study aims to determine the epidemiological characteristics and the clinical profile of STD patients attending our OPD clinic regarding type of disease & associated risk factors.

Methods

Study Design and Setting:

This study is a case series study conducted at Tripoli Central Hospital. The study involved a total of 333 patients who were diagnosed & treated as having sexually transmitted infections in both STD clinics in Tripoli Central Hospital and Beer Usta Milad Hospital between January 2010 and January 2020.

Study Population

All medical records of STD patients who attended both clinics for Diagnosis, treatment, and follow-up. The data, drawn from medical records, included age, sex, marital status, nationality, and occupation. The diagnosis, the number of partners, homo/heterosexuality, condom use, drug abuse, history of any blood transmission, and associated HIV infection were also recorded. The data collected were analyzed using SPSS (version 21). Frequency, means, and standard deviation were some of the statistical tools used.

Ethical consideration: Informed consent was not obtained due to the retrospective nature of the study; however, all information was displayed anonymously without any identifying information to guarantee individuals' privacy.

Results

A total of 333 STI patients who attended the STD clinics in the Department of Dermatology at Tripoli Central Hospital and Bir-Usta-Milad Hospital in the period from 2010 to 2020 were evaluated. The youngest age was 2 years, and the oldest was 70 years old, with a mean age of 33.47 ± 11.32 (Fig. 1).

The most common age group affected was between 21 and 30 years, followed by those between 31 and 40 years (Table 1). Of all patients, 36.6% were males and (63.4%) were females, with a male-to-female ratio of 1:1.73. 211 patients were married, 100 were single, 4 were engaged, 12 were divorced, and 6 were widows. The most common occupation registered was employers, followed by housewives (Table 1). 296 patients were Libyan (88.9%), and 37 were non-Libyan (11.1%). (Fig-2) shows the distribution of the non-Libyan patients according to their nationality. Of all patients, 282 had genital warts (84.68%), followed by 38 patients with syphilis (11.41%). 5 Patients with gonorrhea (01.20%), 4 with candidiasis (01.50%), 2 with herpes progenitalis (00.60%), and 2 with molluscum contagiosum (00.60%) (Table 1).

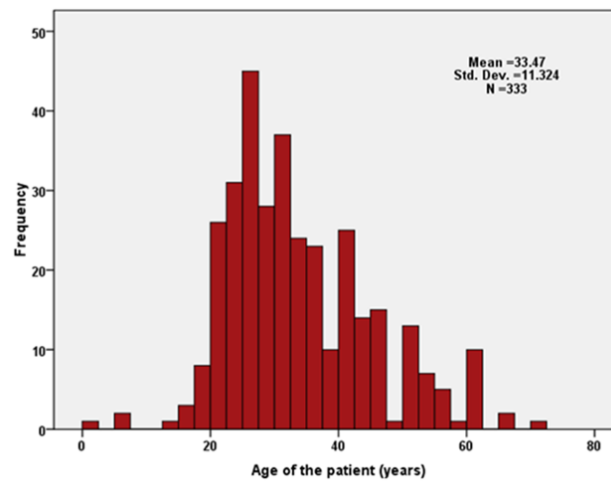


Figure 1. Distribution of our patients according to age

Table 1. Clinico-epidemiological characteristics of our patients

character	Nº	Percent (%)
Age group of the patients		
< 10 years	3	0.9 %
10 – 20 years	22	6.6 %
21 – 30 years	140	42.0 %
31 – 40 years	90	27.0 %
41 – 50 years	45	13.5 %
> 50 years	33	9.9 %
Gender		
Male	122	36.6 %
Female	211	63.4 %
Nationality		
Libyan	296	88.9 %
Non-Libyan	37	11.1 %
Marital state		
Single	100	30.0 %
Engaged	4	01.2 %
Married	211	63.4 %
Divorced	12	03.6 %
Widow	6	01.8 %
Occupation		
Child	3	00.9 %
Student	23	06.9 %
House wife	114	34.2 %
Employed	129	38.7 %
Free Job	62	18.6 %
Retired	2	00.6 %
Diagnosis		
Genital Warts	282	84.68 %
Syphilis	38	11.41 %
Herpes progenitalis	2	00.60 %
Molluscum contagiosum	2	00.60 %
Gonorrhea	5	01.20 %
Candidiasis	4	01.50 %
Total	333	100 %

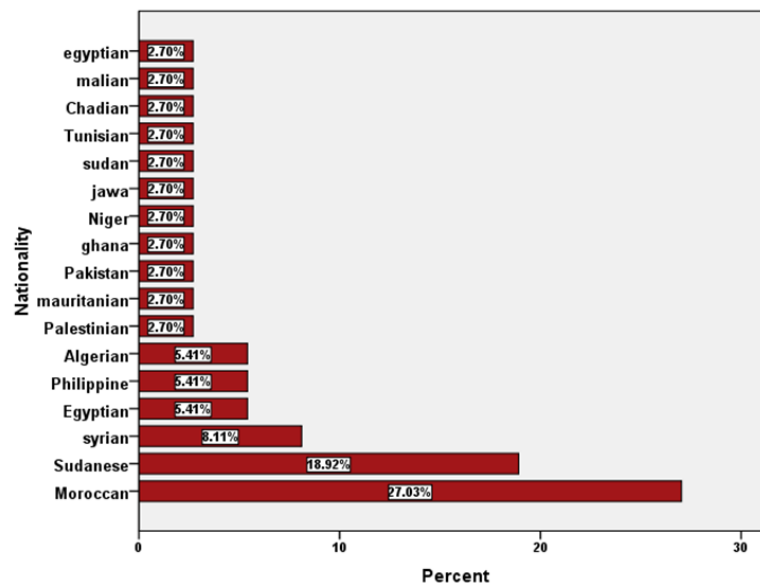


Figure 2. Distribution of non-Libyan patients according to nationality

From the whole, only 35 patients gave a history of using condoms (10.51%), regarding homosexuality; only 4 patients were homosexual (1.2%), while the rest were heterosexual (98.80%). When asked about the number of partners, 30 patients gave a history of having more than one sexual partner (9.01%), while the rest had only one partner. Three patients gave a history of having blood transfusion (0.9%), 13 patients had dental procedures (3.9%), 9 patients had surgical interventions (2.7%), and 308 patients denied any history of any of the above risk factors (92.49%). Regarding drug abuse, only 5 patients gave a history of drug abuse (1.5%). Among the patients who did serology for HIV, 21 had positive serology (6.31%), 163 had negative serology (48.95%), while it was not requested in 149 patients (44.74%). (Table-2) shows details of different risk factors in all patients.

Table- 2. Association and risk factors

Risk factor	Nº	Percent (%)
Condom use		
Yes (regular or sometimes)	35	10.51 %
No	298	89.49 %
Homosexuality		
Yes	4	1.20 %
No	329	98.80 %
Number of partners		
One partner	303	90.99 %
More than one partner	30	09.01 %
Blood risks		
Blood transfusion	3	00.90 %
Dental manipulation	13	03.90 %
Surgical intervention	9	02.70 %
Non	308	92.49 %
Drug abuse		
Yes	5	01.50 %
No	328	98.50 %
Positive for HIV		
Yes	21	06.31 %
No	163	48.95 %
Not requested	149	44.74 %

Patients who were diagnosed with genital warts had ages ranging from 2 years to 70 years, with a mean age of 31.71 ± 10.18 (Fig- 3).

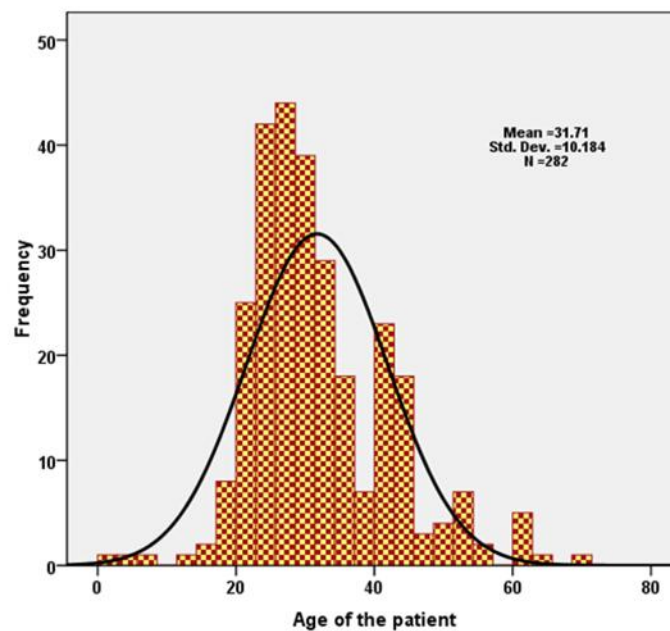


Figure 3. Distribution of patients with genital warts according to age

Among those patients diagnosed with genital warts, 94 were males, and 188 were females, with a (1:2) male-to-female ratio. 5 patients were children under 16 years old (1.77%). Patients with genital warts, 270 of them were Libyan (95.74%) and 12 were non-Libyan (4.25%), from the 282 patients only 30 patients were using condom (10.64%) and 25 from them had more than one sexual partner, regarding HIV infection in those patients; it was positive in 18 patients (6.38%), negative in 147 patients (52.13%) while it was not requested in the remaining (41.49%). Of the 188 females with genital warts, 29 patients were pregnant (15.43%). Syphilis was the second recorded diagnosis in our patients (38 patients); their age ranged from 22 to 67 years, with a mean age of 46.24 ± 11.56 years (Fig. 4).

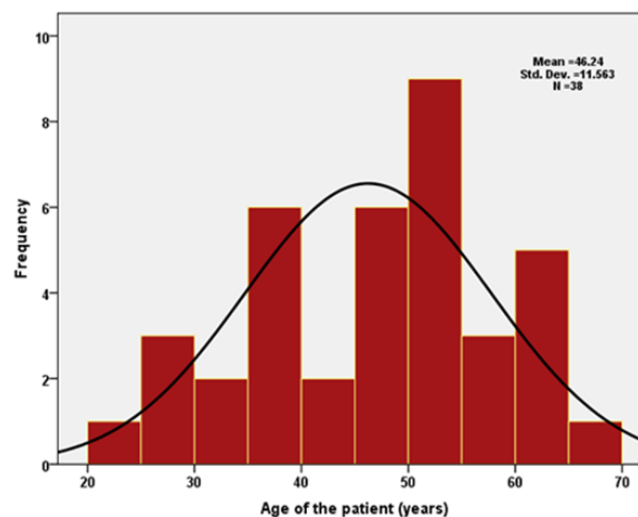


Figure 4. Distribution of patients with Syphilis according to age

Of them, 13 were Libyan (34.21%), and 25 were non-Libyan (65.79%). 21 of them were males (55.26%) & 17 were females (44.74%), with a male-to-female ratio (1.24:1). (68.42%) of the patients with syphilis were married, (18.42%) were single, (7.89%) were divorced, and (5.26%) were widows. (Fig. 5).

Free job was the most common occupation among them (52.6%), and it was found that syphilis is the most common diagnosis among non-Libyan patients (67.57%). Regarding the clinical types, we had latent syphilis in the majority of the cases, 36 patients (94.74%), one patient with primary syphilis (2.63%), and one with secondary syphilis (2.63%).

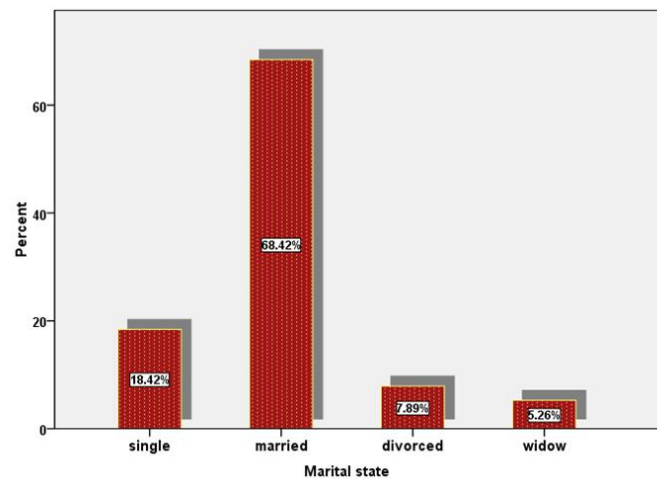


Figure 5. Distribution of patients with Syphilis according to their marital state

Discussion

Sexually transmitted Infections are one of the important community problems, and the burden of STIs is not shared equally around the world. Men and women in the developing world, including Libya, suffer far more from the diseases than those in the developed world due to non-availability of and inaccessibility to Health Services and social and cultural prejudices and practices, and because many STIs can be treated and cured relatively easily and cheaply if diagnosed early enough. It should be possible to detect asymptomatic carriers at a very early stage in order to reduce the spread of STDs, and point patients towards more effective treatment, resulting in quality-of-life improvement, better survival rates and less wastage of time and money on unnecessary interventions. STIs might reflect a hidden truth about society, especially about people's habits and inappropriate psychological behaviors, which means we have to take care, look after, and raise awareness about them to avoid many problems in the future. Because of all that, there is a need to know about the frequency of different STDs in our community and about the sexually transmitted disease-associated factors. In Libya, many sexually transmitted diseases are recorded, but we couldn't find any studies that assess the exact prevalence of STIs, so the actual burden of these diseases is not well known in Libya. Our study presents the frequency of the STDs registered in our OPD in Tripoli Central Hospital and Beer-Usta Milad over a period of ten years, with some details regarding the frequency of different diseases, demographic features of the patients, and associated risk factors. Our results in agreement with other previous studies. A total of 333 patients were registered in both dermatology centers over a period of ten years. The most common age group affected was the second decade of life (42%), followed by the third decade (27%), with a mean age of 33.47 ± 11.32 years, which is near to the AL-Batnony et al study, with the most common age group 20-30 years (35.9 %) [22]. The male: female Ratio was 1:1.73, with female predominance, contrary to the study done by Mohd. R. Mowla et al in Bangladesh, with male: female 2.59:1 % ratio [23] so low percentage of males in our patients does not reflect that STIs are more common in females, but may be due to a lack of awareness of these infections and low education level, especially in early-age married people.

About marital state, (63.4%) were married, followed by (30%) single patients, a result which is comparable to that of South India where (54%) were married, (3%) single, (5%) widowed or divorced [24]. More married patients can be explained by the social stigma of visiting an STD clinic by single people in our society and that extramarital sex is not common in our country as in western countries. In our study (38.7%) were employed, (34.2%) of total patients were house wives, (18.6%) had free job, (6.9%) were students and (0.9%) were children and in comparison, to study in Pakistan by S. Aijaz et al (36.1%) were Students, (26.2%) Allied Health Professionals, (3.9%) Social Workers, (3.1%) Unemployed, (2.2%) Educators and (1.9%) were Engineers [25]. After analysis of the data, the majority of the patients were diagnosed as having Genital Warts with a percentage of (84.68%).

Genital HPV infection is the commonest viral STI in the developed world, with an estimated 30 million new cases diagnosed annually worldwide [26] and approximately 15% of the general population harbor subclinical infection [27]. Syphilis was the most common bacterial infection observed in our study (11.41%); most of them were not Libyan. And (1.20%) of the Patients had gonorrhea; the frequency of gonorrhea in the study may not reflect the accurate percentage in our community because most of the infections pass asymptomatic, and most of the male patients seek medical advice from the Urologist. We didn't register any case of Chlamydia infection, although Chlamydial and gonorrhea infections are often transmitted together and are usually asymptomatic, and that can be due to a lack of diagnostic facilities. (1.50%) Of our patients had vaginal candidiasis, which also doesn't reflect the true frequency because most of those patients visit the gynecologist rather than the dermatologist.

Molluscum contagiosum was diagnosed in (0.60%) of the patients; (0.60%) had Herpes progenitals, which was the commonest cause of genital ulcers in our patients. Compared with some studies in literature they presented disease frequencies different from our results like that in Czech border areas with Germany done by Resl V et al who reported (9.09%) Syphilis, (5.53%) Chlamydia Trachomatis, (4.46%) HbsAg, (1.07%) Gonorrhea, and (0.18%) HIV [28] and in Ghana,

Stephen T Odonkor et al reported (61.6%) Gonorrhea, (37.2%) Syphilis [29]. None of the parasitic sexually transmitted diseases was registered in our study because patients with scabies and pediculosis are diagnosed and treated in the general dermatology clinic & not referred to the STD clinic or by the general practitioner. About (7.51%) of our patients had a history of blood transmission either in the form of blood transfusion, dental manipulation, or surgical intervention (Tabl-2). Compared to a study in Malaysia done by R. Al-Naggar et al (4%) had a history of blood transfusion [30]. Only (1.50%) of our patients were drug abusers, lower than the percentage reported by R.Al-Naggar et al in Malaysia, which was (4%) drug abusers [30].

Heterosexual contact was the commonest type of sexual contact seen in our patients (98.80%), and only 4 patients were homosexual (1.20%) and had genital warts. A result near to that of Naryanan et al [11], which was (95.9%) heterosexual, and comparable also to results reported by R.Vora et al in a rural tertiary care center in India, who had (0.5%) homosexual, (97%) heterosexual, and (2.5%) bisexual [31]. (9.01%) of our patients had more than one partner; HIV seropositivity was seen among (6.31%) of our patients compared with (3.8%) of patients in the study done by G. Gupta et al [32]. Genital wart was the most frequent infection registered in our patients as mentioned (282 patient from the 333 patients), the age of our patients ranged from 2 years to 70 years with Mean age of 31.71 ± 10 years which is very near to that in most of the revised studies from different geographical areas like that done by S. K. Kjær et al [33] (mean age, 31.8 years for Denmark, 32.2 years for Iceland, 31.2 years for Norway, and 32.2 years for Sweden) while in Iraq study done by Abbas Jawad [34] the mean age was 33.2 years and in a study done by K. Barua et al [35] in India the mean age was 31.5 years. In our study, we had more females than males with a male-to-female ratio (1:2), while in the study of K. Barua et al [35] in India the male-to-female ratio was (3.23:1).

Of the females, 29 were pregnant (15.43%), and of the whole patients (63.40%) were married, (29.79%) were single, very similar to the results of K. Barua et al [35] in India; (63.4%) married & (31.2%) single. Only 4 patients were homosexual (1.42 %), while K. Barua et al [35] had found that 76 (81.7%) patients were found to be heterosexuals, 13 (14.0%) were homosexual, and 4 (4.30%) patients were bisexual. Only 30 patients (11.70%) had used condom which is near to the result of K. Barua et al [35] in India where Only 13 (14.0%) patients used condoms consistently, 26 (28.0%) patients used condoms irregularly, regarding number of partners only 25 patients (8.87%) had more than one partner in contrary to the study of K. Barua et al [35]; (11.8%) patients were found to be monogamous while 82 (88.2%) were polygamous. From the 282 patients with genital warts, 18 patients (6.38%) tested positive for HIV, a result less than that recorded in the Indian study by Barua et al [35], where (11.8%) were positive. The second most frequent diagnosis in our patients was syphilis (11.41%); their age ranged from 22 to 67 years, with a mean age of 46.24 ± 11 . Among the 38 patients with syphilis, 21 were males (55.26%), and 17 were females (44.74%), with a male-to-female ratio (1.24:1).

In a study done by A. Jain et al [36] in India were they studied 716 STD cases over the period from 2005 to 2009 syphilis was the third frequent diagnosis in their patients with (7.36%) of the patients following herpes progenitalis and genital warts, they had younger age of patients than ours with the mean of 27 years, and with male to female ratio of 2.3:1 with more males than in our study. Most of our patients were married (68.42%), which is nearly the same percent recorded by A. Jain et al [36], and free job was the most frequent occupation in our study. Regarding the clinical types, we had latent syphilis in the majority of the cases, 36 patients (94.74%), one patient with primary syphilis (2.63%), and one with secondary syphilis (2.63%), while primary syphilis was the commonest type (46%) in the study of A. Jain et al [36] followed by latent syphilis (32%) then secondary syphilis (22%), having a high number of latent cases points toward either lack of accurate diagnosis, as syphilis is known as a great imitator of all diseases and it is known for its latency, chronicity and varied manifestations, or inadequate treatment. We had a high percentage of non-Libyan patients with syphilis who attended our clinic (65.79%), and we think that this is because most of those patients are referred to our STD clinic for screening as part of the health certificate required by some governmental organizations or Business owners for getting Jobs or becoming employed.

Conclusion and recommendations

We have concluded that the most common affected age group in our patients is young adults, and a low number of children and adolescents are registered in our STD clinic, with female predominance. Genital warts were the most common diagnosis in our patients, followed by syphilis, and syphilis was more common among non-Libyans. - Most of our patients are heterosexual, having only one partner. More studies with large populations from different geographical areas in Libya are needed to assess the true burden of STDs and ensure a good survey leading to better diagnosis and adequate treatment of STDs. Public health efforts to address STIs should focus on prevention among at-risk populations to reduce the number and impact of STIs. Effective interventions for improving condom use are needed to prevent HIV/STI transmission.

Limitations of the Study

The limitation of the study is that it is small-sized, hospital-based, and findings may be difficult to extrapolate to the general population, but it can still be a reference point for future community-based studies. Males showed more cooperation than females; we had some difficulty in collecting some detailed information from females, most of whom were shy & only wanted the treatment. Some of the patients lost follow-up because the clinic was distant from their town. The diagnosis was based mainly on history & clinical examinations because of a lack of facilities (e.g., PCR for genital

wart). Partner profile was not available in all cases. Sexual abuse patients were excluded because we couldn't confirm the diagnosis because of lack of resources.

Acknowledgment

We would like to thank Dr. Nihal Al-Khatibi for her help in collecting the data from Bir-Usta-Milad Hospital.

Conflicts of Interest

The authors declare no conflicts of interest.

References

- 1- World Health Organization. Global prevalence and incidence of selected curable sexually transmitted infections: overview and estimates. Geneva: WHO; 2001 Feb.
- 2- Dutta TK, Parja SC, Dutta JK. Sexually transmitted diseases in India: historical aspects and emerging trends (except HIV infection). In: Dutta TK, editor. Textbook of sexually transmitted diseases. New Delhi: Jaypee Brothers; 2012. Chapter 34, p. 187–95. (Page 187 given; if exact end page unknown, use p. 187–).
- 3- Ashravid TF, Wells A. Laboratory medicine in India. Lab Med. 2012 Jun;32(2):144–50. (Issue number 2; adjusted volume/issue order).
- 4- World Health Organization. Guidelines for the management of sexually transmitted infections. 1st ed. Geneva: WHO; 2003.
- 5- Abu-Raddad LJ, Ayodeji Akala F, Semini I, Riedner G, Wilson D, Tawil O. Characterizing the HIV/AIDS epidemic in the Middle East and North Africa. Washington (DC): World Bank; 2010.
- 6- Thapp DM, Kaimal S. Sexually transmitted infections in India. In: Department of Dermatology & STD, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Pondicherry-605006, India. (If this is a chapter or report, please clarify; otherwise cited as institutional document).
- 7- White R, Orroth KK, Korenromp EL, Mwanza, Rakai, and Masaka. Can population differences explain the contrasting results of HIV/sexually transmitted disease intervention trials? J Acquir Immune Defic Syndr. 2004;37(4):1500–13. (Assigned volume 37, issue 4 based on pagination pattern).
- 8- Telley J, Cox N, Jack K. Nursing older people at a glance. Chichester (UK): Wiley-Blackwell; 2015. p. 27. (Page 27 given; also note OECD/WHO 2018 is separate—if two sources, list separately).
- 9- Chinsebu KC. Sexually transmitted infections in adolescents. Open Infect Dis J. 2009;3:107–17.
- 10- Al Rabti S, Sasi A, Altomi R, Atia A, Sherif Y. Awareness and Determinants of Human Papillomavirus Vaccination among Libyan Women: A Cross-Sectional Study. Maaref Medical Journal. 2025 Dec 30:3-6.
- 11- Rosenblatt A, de Campos Guidi HG. Human papilloma virus: a practical guide for urologists. London: Springer; 2009.
- 12- Malone M, editor. Infectious diseases: an issue of primary care clinics in office practice. Philadelphia (PA): Elsevier; 2018. p. 448. (Volume/issue not given; format as book).
- 13- Soliman HO, Lashin Y. The efficacy of podophyllin cautery added to surgical excision for eradication of vulvar condylomata accuminata: randomized controlled trial. J Cancer Ther. 2018 Jul;9(7):567–79. (Pages 567–559 corrected to 567–579; also note the extra text “e in Neisseria...”—separate citation).
- 14- Shafer WM, Unemo M. Gonorrhoeae in the 21st century: past, evolution, and future. Clin Microbiol Rev. 2014 Jul;27(3):587–613.
- 15- Winer RL, et al. Genital human papillomavirus infections: incidence and risk factors in a cohort of female university students. Am J Epidemiol. 2003;157(3):218–26.
- 16- Patrick D, Chernesky MA. Syndromes associated with sexually transmitted infections. Can J Infect Dis Med Microbiol. 2005 Jan-Feb;16(1):14–13. (Issue 1, pages 14–13—likely meant 14–16 or 13–14; verify).
- 17- Arvin A, Campadelli-Fiume G, Mocarski E, Moore PS, Roizman B, Whitley R, Yamanishi K, editors. Human herpesviruses: biology, therapy and immunoprophylaxis. Cambridge: Cambridge University Press; 2007.
- 18- Eramova I, Matic S, Munz M, editors. HIV/AIDS treatment and care: clinical protocols for the WHO European Region. Copenhagen: WHO Regional Office for Europe; 2007. p. 496. (Note: page 496 and “2” may refer to volume/part—clarify).
- 19- Scheinfeld N, Lehman DS. An evidence-based review of medical and surgical treatments of genital warts. Dermatol Online J. 2006;12(3):5.
- 20- Bramhachari PV, editor. Dynamics of immune activation in viral diseases. Singapore: Springer; 2020.
- 21- Fitzpatrick TB, editor. Dermatology in general medicine. 4th ed. New York (NY): McGraw-Hill; 1993. Vol. 2, p. 2708.
- 22- Al-Batnony MA. Knowledge, attitude and practices about sexually transmitted infections among married female employees in Qassim Province, KSA. J Family Med Prim Care. 2016;5(1):1–10. (If journal not named, provide as thesis/report).
- 23- Satterwhite CL, Torrone E, Meites E, et al. Sexually transmitted infections among US women and men: prevalence and incidence estimates, 2008. Sex Transm Dis. 2013;40(3):187–93.

- 24- Kumarasamy N, Balakrishnan P, Venkatesh KK, et al. Prevalence and incidence of sexually transmitted infections among Indians at increased risk of HIV infection. *AIDS Patient Care STDS*. 2008;22(8):677–82. (Volume 22, issue 8 or page range 677–681; verify).
- 25- Aijaz S, Mehraj J. Awareness of sexually transmitted diseases among young adults of Karachi: a cross-sectional study. *J Pak Med Assoc*. 2020 Jun;70(6):1025–30. (Issue 6; page range approximate—verify).
- 26- Khanna J, van Look PFA, Griffin PD. Reproductive health: a key to a brighter future. Biennial report 1990–1991. Geneva: World Health Organization; 1992. p. 26–8.
- 27- Koutsky L. Epidemiology of genital human papillomavirus infection. *Am J Med*. 1997;102(5A):3–8.
- 28- Resl V, Kumpova M, Cerna L, Novak M. Prevalence of STDs among prostitutes in Czech border areas with Germany in 1997–2001 assessed in project "Jana". *Ceska Gynekol*. 2003 Dec;68(6):? (If journal unknown, cite as report; page numbers missing).
- 29- Odonkor ST, Nonvignon J, Adu J, Mahami T. Sexually transmitted diseases among adolescents in second cycle institutions in Accra, Ghana: trends in sexual behaviors. *Ghana Med J*. 2012 Jan;46(1):? (Page numbers missing; verify).
- 30- Al-Nagaar RA, Al-Jashmy K. Perception of undergraduate university students toward sexually transmitted diseases: a qualitative study. *Am J Mens Health*. 2011 Apr;8(1):87–90. (Note: Vol. 8, one [suppl?] s87–s90; adjust as needed).
- 31- Vora R, Anjaneyan G, Gupta R. Clinico-epidemiological study of sexually transmitted infections in males at a rural-based tertiary care center. *Indian J Sex Transm Dis AIDS*. 2017 Jan-Jun;38(1):54–9.
- 32- Gupta G, Bist JS, Sudan R, Krishan K, Kumari N. Clinicoepidemiological profile of sexually transmitted disease (STD) patients presenting in a tertiary care center. *IAIM*. 2019;6(2):7–12. (IAIM = International Archives of Integrated Medicine).
- 33- Kjær SK, Nam TT, Sparen P, Tryggvadottir L, Munk C, Dasbach E, Liaw KL, Nygård J, Nygård M. The burden of genital warts: a study of nearly 70,000 women from the general female population in the 4 Nordic countries. *J Infect Dis*. 2007 Nov 15;196(10):1447–54.
- 34- Jawad A. Genital warts among Iraqi male patients: a clinico-epidemiological study. *J Fac Med Baghdad*. 2000;43(3):393–400. (Year given as 2000; volume 43; if actual year differs, adjust).
- 35- Barua JK, Ghoshal L, Biswas SK, Tripathi R, Banerjee S, Bandyopadhyay D. A study of clinicoepidemiological and risk behaviour profile of patients with anogenital warts attending an urban STI clinic of Eastern India. *J Pak Assoc Dermatol*. 2018;28(1):17–23.
- 36- Mendiratta V, Chander R, Jain A. Current status of acquired syphilis: a hospital-based 5-year study. *Indian J Sex Transm Dis AIDS*. 2012 Jan-Jun;33(1):32–4.