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Community Medicine

Sexually Transmitted Infections: Risk-Factors among Married Female Patients' in Assiut, Egypt

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ABSTRACT

Background: Sexually transmitted infections (STIs) are major concern and public health problem worldwide. Risk-factors of STIs are numerous, their determination is basic for STIs prevention and control.
Objective: To determine the commonest STIs and to define the socioeconomic, gynecological, reproductive, lifestyle, and behavioral risk-factors of the studied STIs female patients.
Patient and methods: The study was conducted on one-hundred STIs married female patients attending the Obstetrics& Gynecology Clinics, Al-Azhar University Hospital, Assiut and one-hundred female as controls. A case-control study design was used. Vaginal, cervical, and urethral swabs and smears were taken from the cases and controls. Scrapes from suspicious lesions together with blood samples were taken for examinations.
Results: The commonest diagnosed STIs were candidiasis (38.0%) and scabies (21.0%). Significant risk-factors for acquiring STIs were the lowest positions of education, income and social-position (ORs=2.02, 2.42, 2.29; respectively). Urban- and shared-residence were significant risk-factors (ORs=4.0, 2.1; respectively). Significant gynecologic/reproductive risk-factors were married at age ≥28years and ≥14years between menses and marriage (ORs=2.15, 2.17; respectively). Pre-marital sexual activities, practicing with symptomatic partners, and had ≥2 life-time sexual partners were significant risk-factors (OR=6.89, 4.13, 4.75; respectively). Non-religiously committed, smoking, and substance-use/alcohol-intake were significant risk-factors (ORs=7.63, 14.1, 9.33; respectively). Not using protective measures, had previous STIs, partners with previous STIs, not advising partner to seek counseling, and counseling of non-healthcare were significant risk-factors (OR=3.73, 27.59, 11.16, 7.7, 24.41; respectively).
Conclusion: There are many preventable risk-factors for acquiring STIs; socioeconomic, demographic, gynecological, reproductive, sexual behavior, lifestyle, and healthcare behavior.

Keywords:*STIs; Married females; Risk-factors; Egypt.*

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INTRODUCTION

Sexually transmitted infections (STIs) are major concern and public health problem for developing and developed countries[1,2]. STIs are common infections; incidence continue to raise[3,4]**.** Annually, ~500 million newly discovered cases of the commonest curable STIs occurring globally[5]. Millions of viral STIs occurs worldwide[6]. Women are fragile to the effects of STIs[7].

In Egypt, STIs are main health, social, and economic load. Diagnosis is basically etiologic and healthcare based on clinical cure. STIs prevalence among rural women is high8; 3.0% of females using family-planning unites, 4.0% of females using ante-natal care unites, and 5.4% of substance-use had

minimally one STI.[9] STIs prevalence in Egypt is up to 3.0% among 15-49years married females.[10]

STIs are major cause of acute ailment, disability, and death.[6] Healthcare for STIs sequelae counts for great costs for cervical cancer treatment, infertility investigations, etc.[11]. Load in developing regions is expensive; 17.0% of economy of mal-health[12]. STIs were defined as risk-factors for human immunodeficiency virus (HIV)[13].

Epidemiology of STIs is deficient in developing countries to many reasons e.g., socio-cultural (stigma), poverty, and inefficient diagnostic facilities[14]. Many STIs are asymptomatic; reported cases, even in developed regions, represent 50.0%-80.0% of actual numbers[15].

STIs have common risk-factors and particular populations are liable to specified STIs[6]. Female gender is a risk-factor to many STIs[7]. Lower socioeconomic-position is proven risk-factor for numerous STIs as Trichomonasvaginalis (TV)[6]. Poverty, minimum access to healthcare, and homelessness/unstable residence may influence woman's sexual risk[16].In Egypt; STIs types, spread, and risk-factors are rising as the results of socio-culture, economic, sexual and healthcare behaviors risk-factors, and substance-use. These factors are influenced by Arabic conservative culture, male superiority, and female sexually conservative. Studies on these risk-factors are scarce[17].

This study aims to define the commonest prevalent STIs among married female patients attending Gynecology-Obstetrics Clinics (GOCs), Al-Azhar University Hospital, Assiut, Egypt and to determine STIs socioeconomic, gynecological, reproductive, sexual and healthcare behaviors, and lifestyle risk-factors.

PATIENTS AND METHODS

I. Study type: Case-control, clinic-based.

II. Study setting and time: Was conducted at GOCs, Al-Azhar University Hospital, Assiut, from January 2019-2020.

III. Ethical considerations: Study protocol was approved by Research Ethics Committee of Assiut Faculty of Medicine, Al-Azhar University. Aims and procedures were cleared to the participants, confidentiality was assured, and informed consents were obtained.

IV. Study participants:

1. The patients: Fisher's equation[18] was used to define patients' sample size. STIs prevalence in Egypt was estimated at 5.4%[9]. The calculated number was 79; increased to 100 to guard against patients with incomplete data.

1.1. Inclusion criteria: Married (currently/previously), aged >18years, practiced sexual activities (any form during the last 3months), with symptoms of STIs and confirmed by clinical and/or laboratory diagnosis.

2. The controls: One-hundred married female, STIs free, age-matched, and attendants' same clinics.

V. Study tools and methods: Patients and controls were subjected to:

1. Interviewing form: Specially designed, comprehensive form was used. Socioeconomic level was determined according to El-Gilanyet al.[19].

2. Psychiatric assessment: Participants were surveyed by standardized, structured questionnaire according to American Psychiatric Association[20] to eliminate participants with psychiatric disorders except substance-use.

3. Clinical examinations: Standardized examinations of the body. Attention was paid to lesions of urethra, vulva, vagina, cervix, vaginal discharge characteristics, uterine and adnexal tenderness, groin, and anal region. Controls with STIs were inserted to the patients' group.

4. Clinical and/or laboratory diagnosis:
4.1. Genital warts (GW) and Molluscumcontagiousm (MC): Were diagnosed clinically.

4.2. Genital herpes (GH): Was diagnosed clinically and laboratory confirmed by detection of specific antibodies for Herpes simplex virus (HSV) type I &II using HerpeSelect ELISA-kit (USA, kit-lot EL0910G-5 for HSV/I and kit-lot EL0920G-5 for HSV/II). Absorbance of each sample-well was read at 450nm on ELISA-reader (stat-fax2100, USA).

4.3. Scabies and Phthirus pubis (PP): Were diagnosed clinically; positive-history of infested husband was a precondition to determine sexual transmission.

4.3.1. Scabies was confirmed by demonstration of mites, eggs or scybala in scrapes from infested papules; scarped materials with 1-2drops of mineral-oil was microscopically examined[21].

4.3.2. PP; pubic hair was examined neatly by hand-lens to inspect infestation with adult-lice or viable-nits[21].

4.4. HBs-Ag and HIV-Abs serologic tests were done to diagnose HBV and HIV infections, respectively using Diagnostic Bioprobes ELISA-kit (Italy) for HBV (HBs-Ag kit-lot C4T5/1) and HIV (HIV-Ab kit-lot C7E7T6/11). Absorbance of each sample-well wasread at 450nm on ELISA-reader (stat-fax2100, USA). Husbands with HBV and/or HIV infection and without other parenteral causes of transmission were preconditions to determine sexual transmission.

4.5. Urethral, vaginal, and cervical swabs were obtained from all patients. Smears and/or swabs from suspected lesions plus blood samples were taken from patients for different microbiologic and serologic examinations[22].
4.6. Patients were microscopically surveyed for Candida albicans, TV, N. gonorrhea, and bacterial vaginosis (BV).

For patients with cervical infections, microscopic examination was done for Gram-stained smears of cervical discharge. Cervical discharge swabs were immediately plated on chocolate-agar and incubated at 35°C in 5.0% CO_2 for gonorrhea and on blood-agar at 37°C for other bacterial pathogens. Growth on chocolate-agar was tested for Gram-negative diplococci and full identified by oxidase-test (+ve) and sugar fermentation-test (ferment only glucose). Growth on blood-agar plates was identified by colonial morphology, Gram-stain, coagulase- and catalase-tests for Gram-positive cocci. Ability to grow on bile salt-agar and sugar fermentation-tests were done for Gram-negative bacilli. Staphylococci are catalase-positive, while streptococci are negative. Coagulase-negative Staphylococcus saprophyticus was distinguished from S. epidermidis by its resistance to novobiocin. Group B streptococci infection was identified by Gram-stain, culture on blood-agar giving beta hemolysis and by the CAMP reaction; arrow head-shaped area of enhanced hemolysis when Str. agalactiae is inoculated perpendicular to a streak of Staph. aureus grown on blood-agar. Sera obtained from patients negative for microscopic and culture results were tested for gonococcal-Ags using LifeSpanBioSciences ELISA-kit (USA) for N. gonorrhea (N. gonorrhea-Ab kit-lot LS-C73232). Absorbance of each sample-well was read at 450nm on ELISA-reader (stat-fax2100, USA).

For candidiasis, direct Gram-stained smear of vaginal secretions was tested for Candida albicans budding-yeasts and further identified by culture on Sabaroud's agar and germ-tube test.

TV was detected by wet mount and/or by culture usingInPouchTV[23].

Non-gonococcal cervicitis (NGCC) cases were tested microscopically for Chlamydia trachomatis (CT) infection by vaginal wet-mount and detection of chlamydia IgM using Diagnostic Bioprobes ELISA-kit (Italy) for CT (kit-lot CT055M). Absorbance of each sample-well was read at 450nm on ELISA-reader (stat-fax2100, USA).

BV was detected by increasing vaginal pH, positive Whiff-test (adding small amount of KOH to microscopic slide containing vaginal discharge; characteristic fishy-odor occurs), presence of clue-cells, and quantitativemorphology of Gram-stained slides[24].

Statistical analysis:

Data were statistically analyzed using the Statistical Package for Social Science, version20. Qualitative data was described as frequency and percentage and analyzed using Chi-square (χ^2) or Fisher-exact (FE) test as appropriate. Odds ratio (OR) was used to define the risk. The significance level for χ^2 and FE was accepted at p-value <0.05. For OR, 95%-confidence interval (CI) or 95%-exact confidence limits (ECL) was used as appropriate.

RESULTS

The commonest prevalent STIs were candidiasis (38.0%), scabies (21.0%), GW (14.0%), and trichomoniasis (14.0%) (table1).

Types of STIs	STIs female patients (n=100)	
	Number	Percent
Candidiasis	38	38.0
Scabies	21	21.0
Genital warts	14	14.0
Trichomoniasis	14	14.0
Non-gonococcal cervicitis:	12	12.0
- Gram +vecocci	3	3.0
- Gram -ve bacilli	4	4.0
- Chlamydia trachomatis	5	5.0
Bacterial vaginosis	11	11.0
Molluscumcontagiosum	9	9.0
Genital herpes	8	8.0
Mixed vaginitis (fungal &protozoal)	8	8.0
Gonococcal cervicitis	7	7.0
Hepatitis B virus infection	6	6.0
Phthirus pubis	5	5.0
Acquired immune-deficiency syndrome (AIDS)	1	1.0
Presence of two STIs	18	18.0
Presence of ≥3 STIs	5	5.0
Total number of diagnosis	153	---

Table 1: Frequency distribution of sexually transmitted infections (STIs) among sample of married Egyptian female patients

Lowest positions of education, income, and social level (ORs=2.02, 2.42, 2.29; respectively) were significant socioeconomic risk-factors. House-wife, ex-married, and urban residence were significant risk-factors (ORs=2.42, 2.12, 4.0; respectively) (table2).

Females married at age ≥28years, ≥14years between menses and marriage, and using of contraceptives were significant gynecologic/reproductive risk-factors (ORs=2.15, 2.17, 2.06; respectively) (table3).

Pre-marital sexual activities, had ≥2 life-time sexual partners, and interchange sex for money/gifts were significant risk-factors (ORs=6.89, 4.75, 18.86; respectively) (table4).

Non-religiously committed, smoking, and substance-use and/or alcohol-intake were significant risk-factors (ORs=7.63, 14.1, 9.33; respectively) (table5).

Patients had previous STIs, partners had previous STIs, and counseling of non-healthcare were significant risk-factors (ORs=27.59, 11.16, 24.41; respectively). Using clothes and sex avoidance as protection were significantly different between cases and controls (P=0.008, 0.004, respectively) (table6).

Socioeconomic variables	Cases (n=100)		Controls (n=100)		OR(95% CI)* OR(95% ECL)**
	No.	%	No.	%	
Educational status:					
Illiterate/read and write	76	76.0	61	61.0	2.02(1.05-3.9)*
Elementary	21	21.0	31	31.0	0.59(0.3-1.18)*
Secondary & university	3	3.0	8	8.0	0.36(0.06-1.55)**
Occupation:					
House-wife	74	74.0	54	54.0	2.42(1.28-4.6)*
Working	26	26.0	46	46.0	0.41(0.22-0.78)*
Income:					
Not enough	74	74.0	54	54.0	2.42(1.28-4.6)*
Enough	25	25.0	40	40.0	0.5(0.26-0.95)*
Enough and save	1	1.0	6	6.0	0.16(0.0-1.35)**
Social level:					
Low	76	76.0	58	58.0	2.29(1.2-4.41)*
Middle	23	23.0	36	36.0	0.53(0.27-1.03)*
High	1	1.0	6	6.0	0.16(0.0-1.35)**
Age (year):					
>18-33	43	43.0	41	41.0	1.09(0.6-1.98)*
34-49	57	57.0	59	59.0	0.92(0.51-1.68)*
Marital state:					
Currently married	56	56.0	73	73.0	0.24 (0.11-0.53)*
Ex-married	44	44.0	27	27.0	2.12 (1.13-4.02)*
Place of residence:					
Urban	78	78.0	47	47.0	4.0(2.07-7.76)*
Rural	22	22.0	53	53.0	0.25(0.13-0.48)*
Shared residence:					
Yes	33	33.0	19	19.0	2.1(1.04-4.24)*
No	67	67.0	81	81.0	0.48(0.24-0.96)*
Husband travelling abroad:					
Yes	9	9.0	4	4.0	2.37(0.63-10.88)**
No	91	91.0	96	96.0	0.42(0.09-1.58)**
Family troubles e.g. husbands' violence:					
Present	11	11.0	4	4.0	2.97(0.84-13.17)**
Absent	89	89.0	96	96.0	0.34(0.08-1.20)**

*Odds ratio, confidence interval **Exact confidence limits

Table 2: Socioeconomic and demographic risk-factors of sexually transmitted infections among sample of married Egyptian female patients

Gynecological and reproductive risk-factors	Cases (n=100)		Controls (n=100)		OR(95% CI)*
	No.	%	No.	%	
Age at menses (year):					
≤14	59	59.0	43	43.0	1.91(1.05-3.48)
>14	41	41.0	57	57.0	0.52(0.29-0.96)
Age at marriage (year):					
18-22	9	9.0	21	21.0	0.37(0.15-0.92)
23-27	48	48.0	53	53.0	0.82(0.45-1.48)
≥28	43	43.0	26	26.0	2.15(1.13-4.08)
Time elapsed from menses to marriage (year):					
≤4	53	53.0	71	71.0	0.46(0.25-0.86)
>14	47	47.0	29	29.0	2.17(1.16-4.06)
Life-time pregnancies:					
0	14	14.0	11	11.0	1.32(0.53-3.32)
1-2	33	33.0	49	49.0	0.51(0.28-0.94)
≥3	53	53.0	40	40.0	1.69(0.93-3.08)
Currently pregnant:					
No	86	86.0	83	83.0	1.26(0.55-0.92)
Yes	14	14.0	17	17.0	0.79(0.34-1.83)
Current use of contraceptives:					
No	58	58.0	74	74.0	0.49(0.26-0.92)
Yes	42	42.0	26	26.0	2.06(1.09-3.92)

*Odds ratio, confidence interval

Table 3: Gynecological and reproductive risk-factors of sexually transmitted infections among sample of married Egyptian female patients**.**

Sexual behavior risk-factors	Cases (n=100)		Controls (n=100)		OR(95% CI)* OR(95% ECL)**
	No.	%	No.	%	
Pre-marital sexual activities:					
No	54	54.0	89	89.0	0.15(0.06-0.32)*
Yes	46	46.0	11	11.0	6.89(3.12-15.51)*
Sexual activities with symptomatic partner:					
No	71	71.0	91	91.0	0.24(0.1-0.58)*
Yes	29	29.0	9	9.0	4.13(1.73-10.09)*
Type of sexual activitis:					
Vaginal	89	89.0	96	96.0	0.34(0.08-1.2)**
Non-vaginal (inter-femoris, oral, etc.)	11	11.0	4	4.0	2.97(0.84-13.17)**
No. of sexual activities/month in last 3 months:					
2-4	27	27.0	16	16.0	1.94(0.92-4.12)*
5-7	32	32.0	61	61.0	0.3(0.16-0.56)*
≥10	41	41.0	23	23.0	2.33(1.21-4.5)*
No. of life-time sexual partners:					
1	63	63.0	89	89.0	0.21(0.09-0.47)*
≥2	37	37.0	11	11.0	4.75(2.14-10.77)*
Interchange sex for benefits e.g. gifts and/or money:					
No	84	84.0	99	99.0	0.05(0.0-0.36)**
Yes	16	16.0	1	1.0	18.86(2.79-798.56)**

*Odds ratio, confidence interval **Exact confidence limits

Table 4: Sexual behavior risk-factors of sexually transmitted infections among sample of married Egyptian female patients

Lifestyle risk-factors	Cases (n=100)		Controls (n=100)		OR(95% CI)* OR(95% ECL)**
	No.	%	No.	%	
Religiously committed:					
Yes	27	27.0	57	57.0	0.28(0.15-0.53)*
Fair	22	22.0	31	31.0	0.63(0.32-1.24)*
No	51	51.0	12	12.0	7.63(3.53-16.77)*
Cigarettes and/or sheesha smoking:					
Yes	37	37.0	4	4.0	14.1(4.67-56.41)**
Sometimes	49	49.0	23	23.0	3.22(1.68-6.2)*
No	14	14.0	73	73.0	0.06(0.03-0.13)*
Substance-use and/or alcohol-intake:					
Yes	48	48.0	9	9.0	9.33(4.201-22.31)*
No	52	52.0	91	91.0	0.11(0.04-0.25)*
Engaging in criminal activities:					
Yes	8	8.0	2	2.0	4.26(0.82-41.95)**
No	92	92.0	98	98.0	0.23(0.02-1.23)**

*Odds ratio, confidence interval **Exact confidence limits

Table 5: Lifestyle risk-factors of sexually transmitted infections among sample of married Egyptian female patients

Healthcare behaviors risk-factors	Cases (n=100)		Controls (n=100)		OR(95% CI)* OR(95% ECL)** $\chi^{2\#}$-FE##
	No.	%	No.	%	
Using preventive/protective measure if partner suspect STI:					
No	58	58.0	27	27.0	3.73(1.98-7.08)*
Sometimes	36	36.0	42	42.0	0.78(0.42-1.43)*
Yes	6	6.0	31	31.0	0.14(0.05-0.37)**
The most common used preventive/protective measures:					
Segregation by clothes	79	79.0	61	61.0	$\chi^{2\#}$=6.88, P=0.008
Sex avoidance	19	19.0	38	38.0	$\chi^{2\#}$=7.95, P=0.004
Others e.g. condom	2	2.0	1	1.0	FE##, P=1
Knowing symptoms of STIs among males and females:					
No	64	64.0	53	53.0	
Yes	36	36.0	47	47.0	$\chi^{2\#}$=2.06, P=0.151
You previously infected with STIs:					
Yes	79	79.0	12	12.0	27.59(12.01-64.82)*
No	21	21.0	88	88.0	0.4(0.02-0.08)*
Partner previously infected with STIs:					
Yes	68	68.0	16	16.0	11.16(5.38-23.43)*
No	32	32.0	84	84.0	0.09(0.04-0.19)*
Advice partner to seek counseling:			n=16		
Yes	36	36.0	13	71.0	0.13(0.02-0.52)**
No	64	64.0	3	29.0	7.7(1.91-44.13)**
Early counseling to manage suspected STIs:			n=12		
Yes	74	74.0	11	89.0	0.26(0.01-1.96)**
No	26	26.0	1	11.0	3.86(0.51-172.65)**
Source of first counseling for suspected STIs:			n=12		
Healthcare professionals	17	17.0	10	58.3	0.04(0.00-0.23)**
Non-healthcare (partner, friends, relatives, etc.)	83	83.0	2	41.7	24.41(4.44-238.53)**
History of compliance with treatment:	n=79		n=3		
Yes	25	31.6	2	75.0	
No	54	68.4	1	25.0	FE##, P=0.251

*Odds ratio, confidence interval, **Exact confidence limits, ***Chi-square test #Fisher-exact test

Table 6: Healthcare behaviors' risk-factors of sexually transmitted infections (STIs) among sample of married Egyptian female patients

DISCUSSION

Few data is obtainable on the extent of STIs in Egypt[25]. In developing world, STIs present major health, social, and economic burden[2].

This study reported 38.0% of patients had candidiasis. This is similar to El-Moselhy et al.[26,27] and Geremew et al.[(10)] figures; 35.6%, 36.0%, 32.5%; respectively. Garget al.[28] observed 19.0%.
In the current study, it was found that 21.0% of the patients had scabies. This finding is double that of El-Moselhyet al.[26] (10.0%) and greatly higher than Sarkar et al.[29] (1.8%); who studied genital scabies, while whole-body scabieswas included in our study. Scabies is common among lowest socioeconomic population[16], this is similar to our findings as the presence of risk-factors e.g. crowding, poor hygiene, and sexual muddle might increase its spread. Scabies is considered from patients' respect as non-STI and is presented in clinic with no stigma.

We showed 5.0% of our patients had PP. This figure is higher than El-Moselhy et al.[26,27], Sarkar et al.[29] figures'; 3.3%, 4.0%, 0.9%; respectively. PP is common among lowest socioeconomic populations; crowding, poor hygiene, and sexual muddle are dominated.

We claimed 14.0% of the patients had GW. Gewirtzmanet al.[6]cleared human papilloma virus (HPV) infection is the commonest STI worldwide. Our figure is comparable to Boschet al.[30]; globally HPV prevalence, in normal cytology females is ~10.0%. Kenyon et al.[31] stated HPV is 7.0%-13.6% in North Africa and Middle East. El-Moselhyet al.[26] reported 13.0%. Dunne et al.[32] reported 26.8% in USA.
We illustrated 7.0% of the patients had GCC. Geremewet al.[14]and Pandey et al.[33] found prevalence 20.8%, 34.6% in Ethiopia and Nepal; respectively. Korenrompet al.[34] and El-Kettani et al.[35] found 0.37%, 3.8%; respectively. These figures differences may be clarified; the small figure was reported among general population. High figures may be referred to differences regarding the studied populations and diagnostic methods. In Egypt, Ali et al.[36] and El-Moselhy et al.[26,27] found N. gonorrhea was 26.0%, 3.3%, 6.0%; respectively. The high figure represents GC urethritis and GCC. NGCC [Gram-positive cocci (3.0%) and Gram-negative bacilli (4.0%)] was higher; 2.2%[26], 2.0%[28], and 2.0%[27], 4.0%[27] for each pathogen.

We showed CT infection was 5.0%. In Egypt, CT prevalence was 1.3%-52.0% among different categories of patients[37]. Our figure is parallel to El-Kettaniet al.[35] (3.8%) and Mosbah&Nabiel[38] (4.4%) figures', higher than El-Moselhy et al.[27] (3.0%) and lower than Javanmard et al.[39] (11.4%).

Bacterial vaginosis (BV) was detected in 11.0% of the patients had BV. Our figure is higher than El-Moselhy et al.[26,27] (8.9% and 8.0%, respectively), double in the study of Pandey et al.[33] (5.8%), and one-fourth that of Garg et al.[28]; 41.0%.

MC was 9.0% among our patients. This is higher than El-Moselhy et al.[26,27]and Sarkar et al.[29] figures; 4.4%, 6.0%, 3.7%; respectively.

Trichomoniasis was 14.0% among our patients. Our figure is higher than Garget al.[28]; 4.0% and similar to Geremew et al.[14]; 14.2%.

Eight-percent of the patients had genital herpes. Our figure is lower than that of Xuet al.[40] (13.2%), Kenyon et al.[31] (15.4%), and Gottlieb et al.[41] (52.0%) figures'. It close to other studies (6.7%, 7.0% and 8.4%, respectively)[(26,27,29)].
We claimed 4.0% of our patients had HBV infection. HBV sexual transmission is significant route for women's infection[42]. This figure is identical to our past figure; 4.0%[27].

We clarified 1.0% of our patients had acquired immune-deficiency syndrome (AIDS). Our figure is identical to Pandey'set al.[33]; 1.0% and higher than Kenyon et al.[31] figures; (0.2%-0.4%).

The lowest educational level among our patients was a significant risk-factor. STIs are common among non-educated[25,26]. This accordant with El-Moselhyet al.[26]; (OR=1.9) and Gottlieb et al.[41] (OR=1.8). House-wife was significant risk-factor. This concordant with El-Moselhyet al.[26]. We cleared that no enough income was significant risk-factor; poverty might influence woman's sexual risk[16]. Our result was parallel to Kelly et al.[16] and Xu et al.[40]; more HSV prevalence among under-poverty level population. Gottlieb et al.[41] observed high HSV prevalence among minorities (OR=2.1). Conjointly, low social-position of our patients was significant risk-factor. This finding is concordant with Osman et al.[25] and Xu et al.[40]. Gottlieb et al.[41] didn't found this association. Social characters in developing communities are associated with STIs propagation[6]. These could be explained by poor economy in developing communities directed governments to expense little on healthcare and prevention programs; healthcare becomes low affordable to the patients. Urban residence, significant risk-factor, might be attributed to residence of slums. This leads to rise of illegal sex and STIs prevailing[43]. Shared- and un-stable residence represented significant risk-factors; had impact on sexual mix-up, families can't spend conservative effect on individuals' socio-cultural behaviors e.g. sexuality and affects female's sexual risk[16]. We showed ex-married patients, divorced, and widow, were significant risk-factor. Our result concordant with Aral et al.[44] and Abdullah et al.[45]; they reported high risk of unmarried females. We could suppose married patient had her own husband. While, divorced and widow might involve in accidental relations. Family disturbances; husband's long travelling abroad and domestic violence were insignificant risk-factors; could be attributed to miss and/or hate of partner.

Age ≤14year at first menses and late age (≥28year) at marriage were a significant risk-factors for STIs acquisition. Globally, mean age at first menses has decreased[44]. Moreover, >13years elapsed from menses to marriage was a significant risk-factor. These results could be explained; late marriage and

much time elapsed till marriage might put females under stress. Socio-cultural changes have led to raise mean age at females' marriage. This elevation might led to many free sexual relations; many of them are pre-marital causal-sex[44]. In developing countries, like Egypt, with social and economic-position characterized by delay and economic inflation, over-population, slums, and retarded education and healthcare services fueling conditions leading to spread of STIs epidemic.

Contraceptive using was a significant risk-factor. This concordant with El-Moselhyet al.[26]. Intrauterine device (IUD) raise risk of genital tract infection by STIs; IUD facilitates biological infection mechanically.

Pre-marital sexual practice was significant risk-factor. Overtime rise in pre-marital relations has been certified. Alterations in sexual behavior have situated females at excess risk for STIs with the worldwide trend to early age at first coitus[44]. The increase in pre-marital sex was facilitated by the improvement of birth-control methods, advances in movement of the women's freedom, social situations and ideas enhanced delay marriage, women's entrance into the labor force, and elevated divorce rate. The major problem female's pose is inability to safeguard herself against STIs[44]. Sexual activity with symptomatic partner was a significant risk-factor. This could be explained by low socioeconomic-position and poor sexual behavior. Scabies and PP didn't necessitate vaginal intercourse. There are some speculations about non-vaginal sexual activities; females might be used/accepted these practices as contraceptive methods. In Egypt, high risk sexual practices are un-agreeable[25]. We reported 89.0%, 11.0% of our patients have practiced vaginal and non-vaginal sex, respectively. Aral et al.[44] cleared normal vaginal sexual practice is the commonest form; ~80.0%. El-Moselhyet al.[26] showed non-vaginal sex was more common among STIs patients; ~20.0% of women experienced oral and/or anal sex. Frequency of sexual activities ≥10time/month was significant risk-factor. This could be explained; 56.0% of our patients were currently married; more ability to make sex. El-Moselhyet al.[26] cleared ~24.0% of STIs women had vaginal intercourse ≥12times/month. Life-time sexual partners' number ≥2 was significant risk-factor. This consisted with Osman et al.[25] and Xu et al.[40]. Interchange sexual activities for benefits was a significant risk-factor. This accordant with El-Moselhyet al.[26] and Abdullah et al.[45]; trade sex is prevalent in statuses recognized by poorness and social degradation, it represents great part in STIs epidemiology in most developing countries.

Religious non-commitment was significant risk-factor. This result concordant with El-Moselhyet al.[26] and Abdullah et al.[45]. Commitment was significant protective-factor. In the Holy Quran, Allah strictly prohibited illegitimate relations and harlotry. Religious commitment has major role in sex avoidance till marriage. In Egypt, religion beliefs, cultural standards, and norms prohibit pre-marital and extra-marital sex. Smoking (cigarette/sheesha) and substance-use/alcohol-intake were significant risk-factor. These consistent with El-Moselhyet al.[26] and Abdullah et al.[45]. Intravenous substance-use is un-agreeable high risk behavior; linked with increased STIs transmission[25]. Substance-use/alcohol-intake is linked with risky sexual activities and behaviors; would raise risk of acquiring STIs[26,45]. Sharing in criminal/socially unaccepted activities history was insignificant risk-factor. Offenders are at risk of acquiring STIs[26,46].

Partner (husband) not using preventive measures to guard against STIs was significant risk-factor. STIs are common among patients practicing unprotected sex[10,25,26,44]. The commonest methods for STIs prevention were the separation between partners with clothes and sex avoidance. The use of other protective measures as condom is scarce. This could be clarified; in developing areas, condom use is low, in Egypt it's uncommon method for prevention and contraception[10,25]. There is males' unfavorable behavior opposed condom use. The shame of buying condoms might be another barrier. This result was consistent with Abdullah et al.[45]. Past-history of STIs among the patients was significant risk-factor. El-Moselhyet al.[26], Gottlieb et al.[41], and Aral et al.[44] found that risk. Among husbands with past STIs infections, females might consider themselves immune or at minimum risk to catch STIs. In most developing countries STIs diagnosis and treatment for women are the greatest stigma[17,25,26]; these force women to conceal and abstain from seeking health appraisal and advice[25]. Divorced or widow females are more shame to seek healthcare for STIs. The shame about STIs might work as an obstacle to fast healthcare searching, related to case of confidentiality or searching to treat symptoms using self-care[17,25]. Women might carry quietly STIs symptoms without searching for healthcare. Were et al.[47] confirmed value of detecting partners of STI patients; used to increase interventions and patients' treatment. Patients not advising their partners to request counseling was considered as risk-factor. This could be explained; STIs stigma, self-care, privacy, or occasional relations[17,25,26]. Early counseling and early diagnosis of husband with STIs could protect his wife. Non-professional healthcare personnel (partner, friends, relatives) counseling was significant risk-factor. Minimum access to effective healthcare may affects woman's sexual risk[16]. This might be explained by stigma, fear, and confidentiality[17,25].

CONCLUSION

Candidiasis andscabies were the commonest STIs. STIs significant risk-factors were low socioeconomic-position, house-wife, urban residence, shared residence, late age at marriage, practice with symptomatic partner, use of contraceptives, pre-marital sexual activities, religiously non-committed, and patient and partner previous STIs. Define STIs risk-factors could help in their prevention and control.

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