PREVALENCE OF SEXUALLY TRANSMITTED INFECTIONS (STIs) AMONG UNDERGRADUATES ATTENDING UNIVERSITY HEALTH CARE CENTRE IN BAYELSA STATE, NIGERIA

ABSTRACT

The study determined the prevalence of sexually transmitted infections (STIs) among undergraduates attending University health care centre within the period of six years between January 2007 and December, 2012. Retrospectively, data was generated using International Classification of Diseases (ICD) 9 and 10. Data obtained were analysed using Statistical Package for Social Sciences (SPSS-20.0). The results showed that 11770 undergraduates visited the health care centre within the study period, of which 342 (2.91%) presented with STIs. Trichomoniasis accounted for 155(45.3%) of the 342 STIs cases seen. The other members of STIs identified were gonorrhoea, 112(32.7%), candidiasis, 23(6.7%), chlamydiasis, 6(1.8%) and syphilis, 4(1.2%). Furthermore, results showed that 37(10.8%) of the identified STIs were co-infections: Candidiasis co-infects with trichomoniasis, 14(4.1%), gonorrhoea with trichomoniasis, 12(3.5%), candidiasis co-infects with gonorrhoea, 7(2.0%), candidiasis co-infects with gonorrhoea and trichomoniasis, 3(0.9%) and gonorrhoea co-infects with syphilis, 1 (0.3%). The highest record of STIs was reported among 100 level students with 192(56.1%) cases while the least was recorded among the 500 level students with 2(0.6%).The study concluded that STIs with 2.91% prevalence must be regarded as significant notorious and real health burden on undergraduates, especially among the unmarried females.

Key words: Sexually transmitted infections, undergraduates, Health care centre, University

INTRODUCTION

Sexually transmitted infections (STIs) formally known as Sexually Transmitted Diseases (STIs) or Venereal Diseases remain a public health problem of major significance in most parts of the world and according to Centre for Disease Control and Prevention, it is an infection due to a variety of bacterial, viral, and parasitic infections that are transmitted primarily by sexual contact including vaginal intercourse, oral sex and anal sex. [1]

World Health Organization estimated that approximately 499 million incident cases of the four main curable STIs namely: gonorrhoea, Chlamydia spp, syphilis and *Trichomonasvaginalis* occur every year, with 85% in non- industrialised countries.[2] however, there are, substantial geographical variations in estimated prevalence and incidence. Sub - Saharan Africa, whilst accounting for 20% of the global STI estimates, has the highest prevalence and incidence rates. The overall yearly incidence rate of curable STIs in Africa is estimated at 254 per 1000 people in reproductive ages (15–49 years), but is only 77–91 per 1000 in industrialised countries. [3, 4]

The second highest rates are found in South and South-East Asia. This is not surprising given the large at-risk populations of young people in these countries, and in the case of China, the opening of its borders to free trade, quickly followed by increases in prostitution and STI, which were once believed to have been controlled.[5]

The reasons for the increase of STIs in many non-industrialised countries are multifactorial but relate to a great extent to the lack of access to effective and affordable STI services in many settings or to the collapse of once relatively performant health systems in countries undergoing harsh economic and health reforms.[6, 7]

STIs impose an enormous burden of morbidity and mortality, both directly through their impact on reproductive and child health, and indirectly through their role in facilitating the sexual transmission of Human Immunodeficiency Virus (HIV) infection.[8] The greatest impact can be seen among women in whom severe complications include pelvic inflammatory disease, chronic pain, and adverse pregnancy outcomes (ectopic pregnancies, endometritis, spontaneous abortions, stillbirths and low birth weight). In both men and women, STIs play a major role in infertility. A growing number of malignancies are also attributed to STIs, notably cervical, anal and penile cancers as well as hepatocellular carcinoma. Congenital infections in the new-born include congenital syphilis, ophthalmia neonatorum and pneumonia. [9, 10]

World Bank [11]estimated that STIs, excluding HIV, are the second commonest cause of healthy life years lost by women in the 15-44 year age group, responsible for 17% of the total burden of diseases in women of reproductive ages, outranked only by causes of maternal morbidity. Yet it is only in recent years that STIs have been accorded any priority by national ministries of health or by the international community, mainly because of their potential interaction with HIV.

Nonetheless, the Centre for Disease Control and Prevention (CDC) in 2007 reported that the exact magnitude of the STIs burden is frequently unknown. Although passive STIs surveillance systems exist in some countries, the data is not always reliable or complete. The quantity and completeness of the available data and estimates depend on the quality of STIs services, the extent to which patients seek healthcare, the intensity of case finding and diagnosis and the quality of reporting.[12]The completeness is further affected by the STIs natural history, since a large number of infections are asymptomatic. Moreover, only part of the symptomatic population seeks healthcare and even a smaller number of cases are reported. The social stigma

that usually is associated with STIs may result in people seeking care from alternative providers or not seeking care at all. As a result, report-based STI surveillance systems tend to underestimate substantially the total number of new cases.[12]

In developing countries such as Nigeria, STIs and their complications are amongst the top five disease categories for which adults seek healthcare. In women of childbearing age, STIs (excluding HIV) are second only to maternal factors as causes of disease, death and healthy life lost [13]

World Bank[11] reported that the highest rates of STIs are generally found in urban men and women in their sexually most active years between the ages of 15 and 35which showed that youths shoulder a substantial burden of STIs, and as reported by Centre for Disease and Infection Control [13] that half of all new STIs occur among young men and women of active sex age groups, it has become necessary to have information about the prevalence and common causes of of STIs among undergraduates.

Traditionally, mechanisms for coping with and regulating adolescent's sexuality, especially marriage and norms of chastity before marriage are being eroded. This has resulted in early/unprotected sex [14] Over 25% of adolescents in Nigeria have had their first sexual intercourse by the age of 15. By the age of 18 years, over 60% have had sexual intercourse, though, the first sex is often experimentation, and adolescents usually do not prepare for it nor take any protective measures. [15] Furthermore, the peculiarity of undergraduates in Nigeria has been explored by various studies and studies have shown an increased level of risky sexual behaviour such as early debut in sexual activities, sex with many partners, low and inconsistent

use of condoms.[14, 15], thus, the need to have information about the prevalence of STIs among undergraduates attending health care centre in a tertiary institution in Bayelsa state Nigeria.

Research Methodology

A retrospective research design was used for this research. The research was carried out in the health care centre of Niger Delta University, Wilberforce Island, a state owned university located in Amassoma community of Southern Ijaw local government area of Bayelsa state. The health care centre offers free medical service and it is the first point of call for any student when ill since it offers free medical services. Retrospectively, data was generated using International Classification of Diseases (ICD) 9 and 10. The code for STI is 9. 090-099, while that of ICD 10 is A50-A64. The study population comprises of all undergraduates that attended the health care centre of the University within the period of January, 2007 through December, 2012.

A purposive sampling technique was used to select case files of all STIs cases attended to from January 2007 through December 2012. Data was collected using checklist and the validity of the instrument was also ascertained. Gathered data was analysed using Statistical Package for Social Sciences (SPSS-20.0), while analysed data were expressed by descriptive statistics. The researcher obtained written permission from the university to use the hospital after defending the proposal before the committee. The anonymity and confidentiality of the case files was ensured.

RESULTS

Table 1 above shows that majority of the undergraduate students 182(53.4%) were between the ages of 20-24 years, 85(24.9%) were between ages 25-29 years, 67(19.6%) were between 15-19 years, while, only 7 (2.1%) were between 30- 34years. All (100%) were Christians, and majority 313(91.5%) were female and 341(99.7%) were single.

Table 2 above shows the prevalent rate of STIs among the undergraduate students to be 2.87 (338/11770). The highest prevalent rate (8.67) was reported in 2009, followed by 3.21 in 2010, then 3.04 in 2011, 2.84 in 2012, 1.59 in 2008 and the least 1.49 in 2007.

Table3 shows that majority of the undergraduates 67(19.6%) and 66(19.3%) were in the faculties of Sciences and Management Sciences respectively. 49(14.4%) were in the faculty of Arts, while faculties of Education, Social Sciences, Agric Technology, Nursing, Engineering, Pharmacy and Basic Medical Sciences had 34(9.9%), 30(8.8&), 21(6.14%), 19(5.56%), 14(4.1%), 13(3.8%) and 10(2.9%) respectively. Faculty of law had the least presentation with only 1(0.3%) STIs.

Table 4 shows the signs and symptoms experienced by the undergraduates with majority having combination of two or more signs and symptoms. The signs and symptoms listed in 1-5 in table 4 constitute the highest clinical manifestations in order of magnitude, followed by 6-10 while the last six had the least distributed frequency of occurrence

Figure 1 above shows that 300 (89.0%) of the undergraduates had single STIs infections. The most common cause of STIs among the undergraduates was trichomoniasis 155(45.8%), 112(33.2%) presented gonorrhoea, 23(6.8%) had candidiasis, 6(1.6%) had chlamydiasis and 4(1.3%) presented syphilis.

Figure 2 shows that 37 (11.0%) of the undergraduates had multiple (co-infections) infections. The most common multiple STIs among the undergraduates was candidiasis + trichomoniasis 14(4-1%).12(3.5%) presented gonorrhoea + trichomoniasis, 7(2.0%) had candidiasis + gonorrhoea, 3(0.9%) had candidiasis + gonorrhoea + trichomoniasis, and 1(0.3%) presented gonorrhoea + syphilis.

Figure 3 shows the academic level (class) of the undergraduates that presented STIs during the period of study. The highest record was reported in among 100 level students with 192(56.1%) cases, 200 level with 63(18.4%) cases, 300 level had 47(13.7%), 400 had 30(8.8%), while the least was recorded among the 500 level students with only 2(0.6%) STIs cases.

Discussions of findings

The study showed that majority of the undergraduates with STIs were within the age range of 20-24 years (Mean age, 22.43, SD ± 3.147). This indicates that these age groups are most venerable to STIs. The findings of this study supports the report of Centres for Disease Control and Prevention[1] that large proportion of STIs is believed to occur in people younger than 25, with the highest rates usually observed in the 20-24 year age group. Reasons inferred for this according to CDC [16, 17] are that this age group are sexually active youth and are more likely than older individuals engage in risky sexual behaviours such as unprotected sex and having multiple sex partners, thus, are potentially at risk of contracting sexually transmitted infections (STIs).

Prevalence of sexually transmitted infections among undergraduates

As shown in the obtained results, the prevalence rate of STI was 2.91% (342/11770) within the studied period. This implies that STIs constitute an important health problem in the University. Apart from the health consequences, it could be adduced that STIs might be contributing factors to school absenteeism among the study populace thus supporting report made by Upchurch *et al*.[18].

Gender-wise, findings from this study reveals that majority (91.5%) of the reported cases were among the female undergraduates compared to their male counterparts. This corroborates reports made by CDC [17] that young woman and female adolescents are more susceptible to STI

due to their genitalia anatomy.[16, 19] In addition, Eng and Butler [20]reported that during adolescence and young adulthood, women's columnar epithelial cells are especially sensitive to invasion by sexually transmitted organisms. Furthermore, Taiwo [21] outlined four main factors which include: biological, psychological, economic, and social cultural as responsible for the specific susceptibility of young active women to STI.

It is important to note that in contrast to the observation recorded in trend increase on yearly basis, the incidence of STI decreases as the subjects advance to the next level of their academic programme. The highest prevalence was recorded at 100 levels and the least in 500 levels. One possible explanation for this observable difference could only be attributed to the fact that at 100 level majority of the subjects are new, thus, sex education, awareness and adequate knowledge maybe lacking. More so, as the student progress in their level of academic programme, maturity sets in and awareness of the stigma associated with STIs might have played a major role by developing new ways to promote protective behaviours, or they may be seeking alternative means of treatment or might have engage in self-medication.

The commonest STIs among the undergraduates within the study period

The most common aetiological cause of STIs among the study population is *Trichomonas vaginalis.* This supports the report made by WHO[22] that trichomoniasis is the most common STI worldwide. It is associated with approximately 50% of STIs in women[22] and is the most common non-viral STI, with an estimated 276.4 million cases annually worldwide.[23]

This study revealed that *Neisseria gonorrhoeae*, the causative agent of gonorrhoea 112(32.7%) is the second prevalent cause of STIs among these undergraduates. This findings support the documentation made by CDC[1] that gonorrhoea is the second most commonly reported notifiable disease in the USA. In addition, Dehne and Riedner [24] reported prevalent rate

of 31% among women in Abidjan[24]. In contrast to this study, some studies showed that the prevalence of gonorrhoea among adolescent girls is usually of lower prevalence rates well below 10% .[25, 26]

Candidiasis, a fungi disease caused by *Candida albicans* is the third commonest cause of STIs followed by Chlamydiasis, caused by *Chlamydia trachomatis.* Though, chlamydiasisis considered an adolescent infection, and its presence is a marker of recent onset of sexual activity, the outcome of this present study is in contrast to various reports where prevalence rate is high. [27,28,29] Nevertheless, the low prevalent rate recorded in the present study may be due to the asymptomatic nature of this disease, incomplete screening coverage and under reporting as documented by Levine, [30]

Co-infection of STIs

Sexually transmitted co-infections pose considerable health threats to people living with STIs, while multiple sexually transmitted co-infections are common because the pathogens share transmission routes. Findings from the study were able to show co-infections among 37(10.8%) of the cases reported during the studied period. This outcome supports findings reported by Nusbaum *et* al.[31] and Kalichman *et al*.[32] In addition, WHO [33]supports the fact about co-infections and sequelae in patients treated for gonorrhoea in up to 50% of cases, which has led WHO to recommend that as a routine both infections should be treated simultaneously[11, 33].

In this present study, co-infection of *Candida albicans* (candidiasis) with *Trichomonas vaginalis* (trichomoniasis) was the most prevalent with 4(4.1%). This finding supports earlier report made by Alo *et* al. in Abakaliki, South eastern Nigeria [34]. Though in contrast to this, a higher prevalent rate of co-infection of 21.7% was reported by them. Furthermore, co-infection of Gonorrhoea with Trichomoniasis(3.5%) was also observed, followed by Candida co-infected with gonorrhoea

(2.0%). It is noteworthy, that three (0.9%) of the undergraduates in this study were co-infected with triple STIs agents (Candida, Gonorrhoea and Trichomonas).

Management patterns

Clotrimazole, Metronidazole, Ciprofloxacin, doxycycline, and Gentamicin were the drugs majorly prescribed in this centre for treatment of STIs. However, because of the burden attributed to STIs, WHO has recommended a syndromic approach to diagnosis and management of STIs in patients presenting with consistently recognised signs and symptoms of particular STIs. Findings from this study is in line with CDC and WHO recommendations that multiple, combinatory antibiotics are recommended for the management of all types of STIs [13.33]

Recommendations

- Enlightenment programmes on the prevention of sexually transmitted infections among undergraduates should be done at orientation of newly admitted students and routinely for old students.
- Provision of separate special clinics (youth friendly clinic) and trainings of professionals particularly Nurses for STIs cases in university.

References

1. Centers for Disease Control and Prevention.(CDC) Sexually Transmitted Disease Surveil lane, Data for 2006-2010.Atlanta, GA. Department of Health and Human Services. Avail able at: http://www.cdc.gov/std/stats10/toc.htm 2011

2. World Health Organization [WHO]. Global strategy for the prevention and control of sexually transmitted infections: 2006-2015. Geneva: WHO 2009. Available from: http://www.who.int/reproductive-health/publications/stisstrategy/stis_strategy.pdf [Retrieved: 21 April 2009].

3. Emiasegen, S.E., Nimzing,L., Adoga, M.P., Ohagenyi, A,Y., and Lekan, R. Parvovirus B19 antibodies and correlates of infection in pregnant women attending an antenatal clinic in central Nigeria**.** *Memórias do Instituto Oswaldo Cruz.* 2011 *106*(2):227-31.
4. Malla Nancy and Goyal Kapil Sexually transmitted infections. In Nancy Malla (Ed.), An overview of sexually transmitted infections, (2012). ISBN: 978-953-51-0258-8, In Tech, Available from: http://www.intechopen.com/books/sexually-transmitted-infections/sexually-transmitted-infections-an-overview
5. Mayaud, P.; McCormick, D. Interventions against sexually transmitted infections (STI) to prevent HIV infection. British Medical Bulletin (2001) 58 (1) 129-153. [DOI: 10.1093/bmb/58.1.129]
6. Riedner, G., Dehne, K.L., and Gromyko, A. Recent declines in reported syphilis rates in eastern Europe and central Asia: are the epidemics over? *Sex Transm Infect* 2000 *76*, 363–5.
7. Joint United Nations Programme on AIDS/World Health Organisation(UNAIDS/WHO), Working Group on Global HIV/AIDS/STI Surveillance. *Guidelines on estimating the size of populations most atrisk to HIV*. Geneva, World Health Organization. 2010
8. Mayaud, P and Mabey, D. (2004): Approaches to the control of sexually transmitted infections in developing countries: old problems and modern challenges. *Sex Transm Infect 80*, 174-182. doi: 10.1136/sti.2002.004101
9. Gerbase A., Stein, C., Levison, J. and Htun, Y Global burden of sexually transmitted diseases excluding (HIV) in the year 2000.World Health Organization, Geneva: 2006.
10. WHO European Strategy for childhood and adolescent health and development 2005
11. World Bank Fact Sheet (No 110), 2013 STIs Available at http://www.who.int/mediacentre/factsheets/fs110/en/
12. Centers for Disease Control and Prevention (CDC). Sexually Transmitted Disease Surveillance, 2006. Atlanta, GA, November 2007. http://www.cdc.gov/std/stats/trends2006.htm *Annually updated statistics on reported STD in the US.*

13. Centers for Disease Control and Prevention (CDC), Fact Sheet STD Tends in the United States. 2011: National Data for Chlamydia, Gonorrhea and Syphilis. Sexually Transmitted Disease Surveillance, 2013. Avail at www. Cdc.gov/std/stats

14. Nigeria Demographic and Health Survey National Population Commission (NPC) and ICF 2009. Abuja, Nigeria: NPC and ICF Macro 2008

15. Nigeria Demographic and Health Survey (). National Population Commission (NPC) and ORC 2004. Claverton, Maryland: NPC and ORC Macro 2003

16. Centers for Disease Control and Prevention (CDC) Sexually Transmitted Disease Surveillance, 2008. Atlanta, GA: U.S. Department of Health and Human Services; November 2009.

17. Centers for Disease Control and Prevention (CDC) Sexually transmitted infections (STIs) indicators on children and youth. *Child Trends Data Bank*, 2012:3-11. Available at www.childtrendsdatabank.org

18. Upchurch, MD., Mason, MW.,Kusunaki, Y., and Kriechbaum, JM (2004). Social and Behavioural determinants of Self-Reported STD among Adolescents.*Perspectives on Sexual and Reproductive Health*, 36(6): 276-287.

19. Akinyemi, I.A and Okpechi, U. F-M. Age, class, sex and the danger between: Socio-economic inequalities and sexual & reproductive vulnerabilities of young women in Africa. *Sexuality in Africa Magazine and Monographs*, 2011 7(1):9-11.

20. Eng TR, and Butler WT The Hidden Epidemic: Confront- ing Sexually Transmitted Diseases. Washington, DC: Na- tional Academy Press, 1997.

21. Taiwo, OO., Young Female and African: issues in sexual vulnerability. Sexuality in Africa Magazine and Monographs, 2011: 7(1):3-4.

22. World Health Organization (WHO), Global Prevalence and Incidence of Selected Curable Sexually Transmitted Infections: Overview and Estimates, Geneva: WHO, 2001.

23. World Health Organization [WHO](2010).fact sheet available at http://www.who.int/mediacentre/factsheets/fs110/en/. WHO (2011).http://www.who.int/hiv/pub/progress_report2011/summary_en.pdf.

24. Dehne, K.L, and Riedner, G. Sexually transmitted infections among adolescents: the need for adequate health care. Geneva: WHO 2005.

25. Kilmarz PH, Black CM, Limpakarnjanarat K. Rapid assessment of sexually transmitted diseases in a sentinel population in Thailand: prevalence of chlamydial infection, gonorrhoea, and syphilis among pregnant women *Sex Trans Inf*. 1998: 74, 189-193.

26. Blankhart D, Muller O, Gresenguet G, Weis P Sexually transmitted infections in young pregnant women in Bangui, Central African Republic.*International Journal of STD and AIDS*. 1999 10(9): 609-614.

27. Vuylsteke B, Laga M, Alary M, Clinical algorithms for the screening of women for gonococcal and Chlamydial infection: evaluation of pregnant women and prostitutes in Zaire. Clin Infect Dis; 1993 17: 82-8.

28. Behets FMT, Williams Y, Brathwaite A Management of vaginal discharge in women treated at a Jamaican sexually transmitted disease clinic: use of diagnostic algorithms versus laboratory testing. *Clin Infect Dis* 1995 21: 1450-5.

29. STD Surveillance. Special Focus Profiles, STDs in adolescents and young adults; 2003; 53-61; Available from: http://www.hawaii. edu/hivandaids/STDs_in_Adolescents_ and_Young_ Adults_2003.pdf [Retrieved: April 20, 2009].

30. Levine WC Indirect estimation of chlamydia screening cover- age using public health surveillance data, American Journal of Public Health, 2004

31. Nusbaum, RM., Wallace, RR.,Slatt, LM., and Kondrad, EC (2004): Sexually Transmitted Infections and Increased Risk of Co-infections with HIV. *J. Am. Osteopath Assoc*104(12):527-535.

32. Kalichman, CS., Pellowski, J and Turner, C. (2011): Prevalence of Sexually Transmitted co-infections in People living with HIV/AIDS: Systematic review with implications for

using HIV treatments to prevention. *Sex Transm Infect*87: 183-190. Doi:10/1136/sti2010.047514

33. World Health Organization [WHO].Youth friendly health services. Background paper for Technical Steering Committee Second Meeting. 29 May - 2 June, Geneva: WHO, Department of Child and Adolescent Health and Development, 2000. 2011

34. Alo, M.N., Anyim C., Onyebuchi A.K. and Okonkwo E.C Prevalence of asymptomatic Co-Infection of Candidiasis and Vaginal Trichomoniasis among Pregnant Women in Abakaliki, South-Eastern Nigeria. *J Nat Sci Res* 2012 2(7): 87-91 .

Variable	Frequency	Percent (%)
AGE (Years)		
15 - 19	67	19.6
20 - 24	182	53.4
25 - 29	85	24.9
30 - 34	7	2.1
*Missing	1	
Sex		
Male	29	8.5
Female	313	91.5
Marital Status		
Single	341	99.7
Married	1	0.3
Religion		
Christian	342	100.0
Islam	0	0.0
Traditional	0	0.0

Table 1: Demographic Data (n = 342)

Period	No of Patients (Sickbay Attendance)	No. of Patients with STIs	Prevalence rate	Prevalence Rate per 100,000
2007	940	14	1.49	0.014
2008	1945	35	1.59	0.031
2009	496	43	8.67	0.043
2010	1435	46	3.21	0.046
2011	3153	96	3.04	0.096
2012	3801	108	2.84	0.108
Total	11770	342	2.87	0.338

321 Table 2: Prevalence Rate of STIs presented to the health care centre during Jan, 2007 through
322 Dec., 2012 (n = 342)

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Variable	Frequency	Percent
Sciences	67	19.59
Management Sciences	66	19.30
Arts	49	14.33
Education	34	9.94
Social Sciences	30	8.77
Agricultural Technology	21	6.14
Nursing	19	5.56
Engineering	14	4.09
Pharmacy	13	3.80
Basic Medical Sciences	10	2.92
Law	1	0.29
Total	342	100.00

Table 3: Faculty of students with STIs presented to health care centre during Jan, 2007 through Dec., 2012 (n = 342)

	Variables	Frequency	Percentage
1.	Vaginal Discharge + Itching + lower abdominal pain	76	22.22
2.	vaginal discharg + Itching + dysuria	56	16.37
3.	vaginal discharge	34	9.94
4.	vaginal discharge + itching	26	7.60
5.	Vaginal discharge+ rashes + itching +sore	20	5.84
6.	Dysuria + Lower Abdominal Pain	12	3.50
7.	Penile discharge + lower abdominal pain + dysuria	10	2.92
8.	Purulent Penile discharge + dysuria	9	2.63
9.	dysuria	8	2.33
10.	Vaginal discharg+ frequent micturation	7	2.04
11.	Vaginal discharge +itching + Rashes + sore + dysuria	5	1.46
12.	Dysuria + Rashes + fever	3	0.87
13.	vaginal discharge + Nausea + vomitting	2	0.58
14.	Penile discharge + Itching	2	0.58
15.	Blister around the corona of penis	1	0.29
16.	Epididymitis	1	0.29
	Total	342	100

Table 4: Signs and symptoms presented by undergraduates with STIs at the health care centre during Jan, 2007 through Dec., 2012 (n = 342)

Variables	Frequency	Percent
Metronidazole + doxycycline + clotrimazole (vaginal pessary)	45	13.16
Ampiclox+Metronidazole+ doxycycline + clotrimazole (V. pessary)	38	11.11
Gentamicin + Metronidazole + Ciprofloxacin + clotrimazole (vagina pessary) + Ibrupofen + Piriton/ Prednisolone	28	8.19
Ciprofloxacin + Metronidazole + Clotrimazole	24	7.02
Amoxil+ Ciprofloxacin + Metronidazole + doxycycline + dichlofenac + clotrimazole (vaginal pessary)	21	6.14
Ciprofloxacin + Prirton/ Prednisolone + doxycycline + Metronidazole + Clotrimazole (vaginal pessary)	20	5.85
Gentamicin + Ciprofloxacin + Metronidazole + doxycycline	16	4.68

+Clotrimazole (vaginal pessary)		
Gentamicin + Ciprofloxacin + Metronidazole + doxycycline + dichlofenac + clotrimazole (vaginal pessary)	16	4.68
Metronidazole + Prednisolone + Clotrimazole (Vaginal Pessary)	14	4.09
Fluconazole (diflucan) + Piriton + Clotrimazole (vagina pessary)	14	4.09
Fluconazole + Metronidazole + Ciprofloxacin + doxycycline +Gentamicin + Clotrimazole	9	2.63
Ampiclox + Gentamicin + Metronidazole + Clotrimazole	8	2.34
Gentamicin + Metronidazole + doxycycline + Clotrimazole	7	2.05
Metronidazole+Erythromycin + fluconazole + Clotrimazole	6	1.75
Tetracycline + gentamicin +Co-trimoxazole + Ciprofloxacin +	6	1.75
Ampiclox + dichlofenac + piriton + Clotrimazole (vaginal pessary)	5	1.46
Gentamicine + Metronidazole + doxycycline + clotrimazole	5	1.46
Gentamicin + Ciprofloxacin + doxycycline + diclofenac	5	1.46
Gentamicin + Metronidazole + Clotrimazole	5	1.46
Fluconazole + Metronidazole + Clotrimazole	5	1.46
Gentamicin + Erythromycin + Ciprofloxacin + clotrimazole	5	1.46
Procaine Penicillin + Ciprofloxacin + doxyxcline + clotrimazole	5	1.46
Metronidazole + Erythromycin + doxycyline	4	1.17
Fluconazole + Metronidazole + Ciprofloxacin + clotrimazole	4	1.17
Co-trimoxazole + PCM + vit C	3	0.88
Fluconazole + doxycycline + Metronidazole + dichlofenac	3	0.88
Ampiclox + Metronidazole + Ciprofloxacin + Clotrimazole	3	0.88
Ampiclox + Ciprofloxacin + Gentamicin + Dichlofenac + Clotrimazole	3	0.88
Amoxyl + Ciprofloxacin + Ibrufen +clotrimazole (vaginal pessary)	2	0.58
Prazequantel + ciprofloxacin + Metronidazole	1	0.29
Amoxyl + Metronidazole + Clotrimazole	1	0.29
Strptomycin + doxycycline + clotrimazole + Ibruprofen	1	0.29
clotrimazole + Vit C + folic acid	1	0.29
Doxycycline + Dichlofenac	1	0.29
Ampiclox + Ibrufen + clotrimazole	1	0.29
Ampiclox + Gentamicin + Metronidazole + doxycycline + clotrimazole	1	0.29
Fluconazole + Erythromycin + Prednisolone	1	0.29
Ampiclox + Amoxyl + Gentamicin	1	0.29
Ofloxacin + Gentamicin + Doxycycline	1	0.29
Total	342	100.

Table 5: Treatment (drugs prescribed) administered to undergraduates with STIs during Jan, 2007 through Dec., 2012 (n = 342)

Figure 1: Common Cause of STIs among adolescents during the period of study, Jan 2007 through Dec., 2012
(n=300)

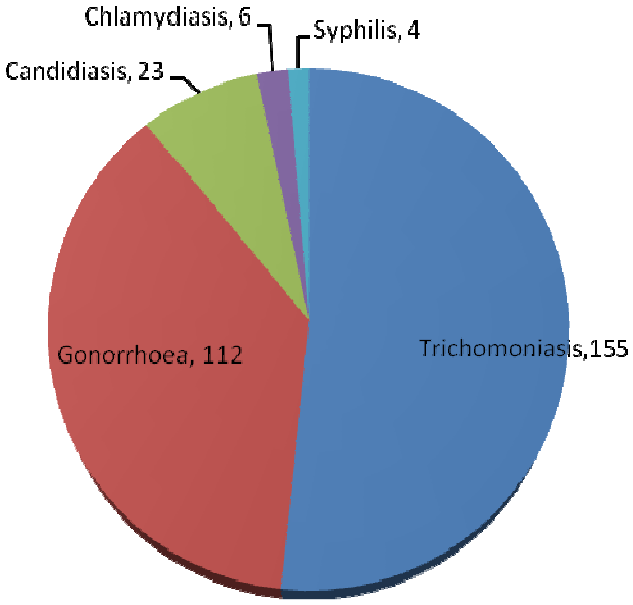
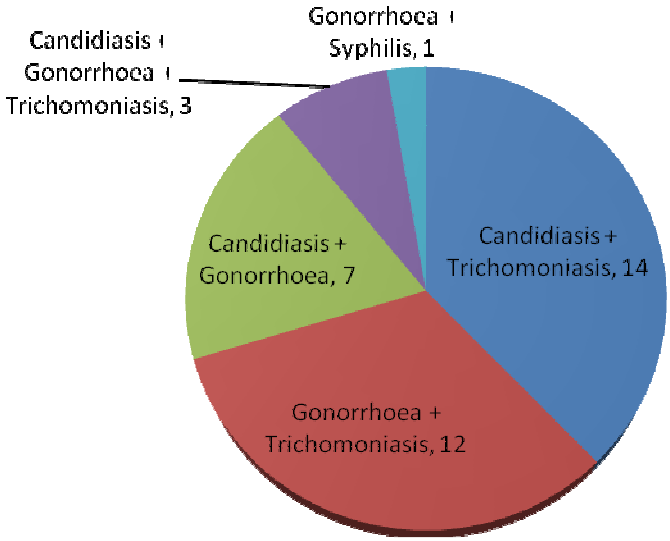
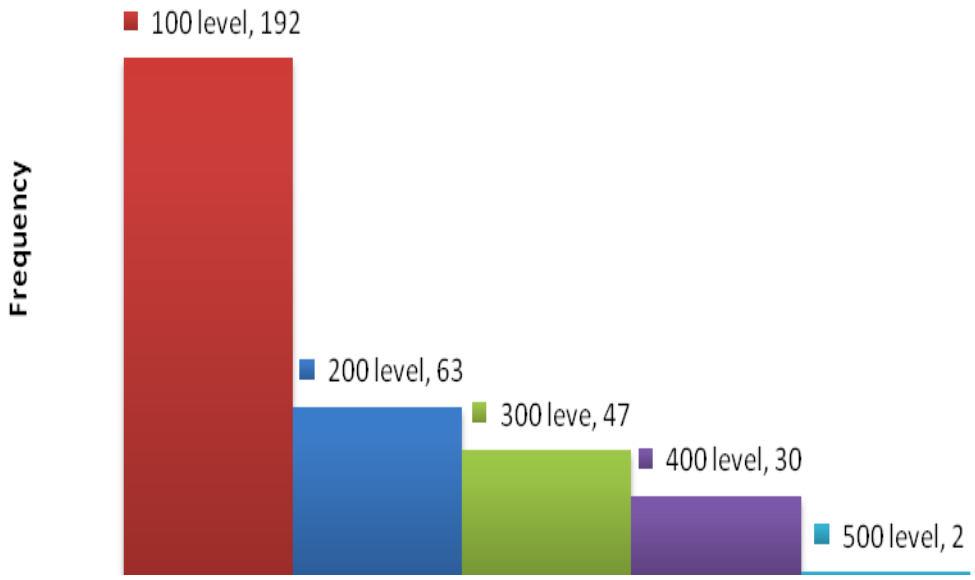


Figure 2: Co-infections (Multiple) courses of STIs among adolescents during the period, Jan 2007 through Dec., 2012
(n= 37)



343 **Figure 3: Academic level of adolescents with STIs during the studied period, Jan 2007**
344 **through Dec., 2012**



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