Ethiopian Journal of Reproductive Health

Editorial Office

Editorial matters and correspondence concerning articles should be addressed to the

Editor-in-Chief :

Ethiopian Journal of Reproductive Health
P.O. Box 8731, Addis Ababa
Tel: 251-11-5506069
Fax: 251-11-5506070
Email: esog@ethionet.et

ORIGINAL ARTICLE:

Risky sexual practices among private college students: A cross-sectional study at Central University College, Addis Ababa, Ethiopia

Abyot Asres[1]

Abstract

Background; *Individuals engaged in risky sexual behavior are at risk for negative consequences such as sexually transmitted infections (STIs), Human Immunodeficiency virus (HIV) and unwanted pregnancies.*

Objectives; *to assess the magnitude and factors associated with risky sexual practices among regular students of the Lancia campus of Central University College*

Methodology; *Institution based cross sectional study was conducted among 197 regular students of the Lancia campus of Central University College, one of the pioneer private colleges in Ethiopia. Data were collected with pretested self administered structured questionnaire, and processed on SPSS statistical software.*

Result; *Fifty four percent of the students are sexually active of whom 32.6% had risky sexual practices. The students are practicing a wide range of sexual practices, including having multiple sexual partners, having sex with commercial sex workers, having sex with the same sex and other than vaginal route sexual intercourse. The person living with perceived parents' economy, marital status, alcohol intake, route of sexual intercourse and age at first sex initiation are factors significantly associated with risky sexual practices.*

Conclusion and recommendations; *The majorities of the students in private higher institutions are sexually active and practicing a wide range of risky sexual practices. Risky sexual practice is associated with the individual demographics and lifestyle, parents' characteristics and school environment. Hence targeted intervention involving students, parents and school administration and in-depth qualitative studies are required to curb the prevailing risky practices* **(Ethiopian Journal of Reproductive Health, 2014, Volume 7(1), 2-10).**

Key Words; *Risky sexual practice, HIV infection, unwanted pregnancy, college students, Ethiopia*

[1] School of Public Health, Addis Ababa University, Ethiopia

Introduction

Adolescents and youth, particularly between 10 and 25 years of age undergo physical, emotional, mental and social changes that place their life at risk. The period involves sexual experimentation characterized by early sexual debut, having multiple sexual partners, engaging in unprotected sexual intercourse, engaging in sex with older partners and consumption of alcohol and illicit drugs (1, 2). Consequently, they are exposed to unwanted pregnancy, child bearing at an early age, unsafe abortion, HIV infection, other sexually transmitted diseases, rape, unemployment, poverty and criminal acts (3-6).

Adolescents and youths have not been traditionally considered a health priority since they had lower morbidity and mortality than older and younger age groups. However, due to the high prevalence of HIV and STIs among this age group, sexual behavior of youths becomes a priority public health concern (6). Currently young people experience puberty at a younger age that they debut sex at an early age which often is unprotected and unplanned. Consequently such acts expose them to unwanted pregnancy, unsafe abortion and STI (7).

Risky sexual behaviors are defined as having multiple sexual partners, casual partners, unprotected sexual activity, or coinciding risky behaviors such as heavy alcohol consumption. Individuals with the risk behavior are at risk for negative consequences, such as STIs, HIV and unwanted pregnancies. Sexually active adolescents and young adult are particularly vulnerable to HIV/STIs. The United Nations joint program for AIDS estimates that about half of new HIV infections worldwide occur among people aged 15–24 years and HIV infection through sexual transmission is growing the fastest, from 7.2% in 2002 to 43.6% in total infections by the end of 2005 (8).

Approximately 48% of all new STIs occurred in the USA in 2006 are among 15 to 24 years old. Females younger than 25 years accounted for 22.9% of all STI declarations as compared to males of the same age group accounted for 9.2%. In the same year in the USA the number of HIV and AIDS cases that occurred among persons aged 15 to 24 years accounted for nearly 14% of all HIV and AIDS cases diagnosed. Findings from a nation- al survey in the USA indicated that among sexually active college students, 0.2% of women and 0.4% of men reported having HIV and 2.3% of female students reported having become unintentionally pregnant (9-11).

In developing countries, where adolescents (15–24 years old) make up 25% of the sexually active population, they constitute almost 50% of all new acquired STIs. Several studies from Sub Saharan African countries show a high prevalence of STIs including HIV among youths, with females having a higher prevalence compared to males. For every 15-19 year old boys, there are 5-6 girls of the same age that are infected with HIV. In contrast, male youths have a higher number of sexual partners than females (12-15) . .

Premarital sex, formerly an unacceptable behavior, is being reported by a growing number of young people, including college undergraduates. Research on the sexual behavior of Chinese university students show that 9–16% of students report that they are sexually experienced and 44.0% of them thought that premarital sex is acceptable (16) . Though abstinence, being faithful, and consistent condom use are recommended prevention interventions, young people are still practicing risky sexual practices including inconsistent condoms use (17).

Modern education is claimed to expose adolescents to different value systems, and the school environment enables the students to interact more with partners of the opposite sex.

Due to their level of maturity and desire for new experiences, the peer pressure they face, the absence of immediate parental control, the change of their living environment, and the need to 'fit in', students are exposed to unsafe behavioral patterns that give rise to HIV infection and related sexual and reproductive health (SRH) problems. As a group, students are an essential focus for prevention and control programs for the adverse effects of risky sexual practices. Since most new infections are in young people, modest changes in behavior will have a significant impact on the epidemic (18, 19) .

Studies in different public Universities of Ethiopia have shown a high prevalence of risky sexual activities among the students. A study conducted in Bahir Dar University, reported that 69.1% of students were sexually active; of which 25.3% started sexual intercourse before the age of 18 years. In the same study it was also indicated that 27.8%, 34.4% and 7.8% of students have had multiple sexual partners, had practiced unprotected sex and had sex with commercial sex workers respectively (20). Studies in Jimma and Haromaya Universities also reported 56.3% and 23.5% of students had unprotected sex with casual partners respectively (21, 22). Studies in the different Universities have also indicated students had risky sexual behaviors, including having multiple sexual partner, sex with prostitutes, not using condoms and casual sex. A study in Gonder University showed, 23% had sex with prostitutes and only 37.1% of them used condom (23). Similarly, a study in Haromaya University reported 41.2% of students were sexually active, and 27.8%, 39.9% and 23.5% of students had multiple sexual partners, sex with commercial sex workers (CSW) and sex with a casual friend respectively (22). A study in Medawelabu university showed 42.3%) of the students were sexually active of whom 34.7% had initiated sex after joining the university and 56.2 % of students practiced unprotected sex (24).

The majority of the adolescents spend much of their time at schools, mainly high schools and higher institutions. Regardless of the prevailing global situation among adolescents and youth, programmatic response to the Ethiopian adolescents and youth in higher learning institutions is described as silent. Despite few isolated initiatives, there was a weak coordinated HIV and AIDS program designed for students of higher learning institutions. The few initiatives, including MARCH project in Addis Ababa University (25) are limited to the public universities. As a result evidence on the practice of private higher institutions is lacking for the design of proper interventions. Therefore, this study assessed the level of risky sexual practices and factors associated with the practice among one of the private higher institution in Addis Ababa, Ethiopia.

Methods

The study was conducted in the Lancia campus of Central University College, one of the pioneer private higher institutions established in 1995 in Addis Ababa, Ethiopia. The university college is composed of seven campuses situated in different parts of the country of which three are situated in Addis Ababa. In the 2011/12 academic year, the Campus has enrolled 543 regular students of whom 275 are females.

An institution based cross-sectional study was conducted from April to Jun 2012 among 197 regular students enrolled in the stated academic year. The sample size was calculated using the single population proportion formula by taking the prevalence level of risky sexual practices among adolescent students of 25% (26) and the assumption of a 5% margin of error and with a 95% confidence level. Using finite population correction and adding 5% allowance for non-response and refusal, the final sample size was 197. All regular students who volunteered to participate and were able to respond were included in the study. Those who are severely ill and extension students were excluded.

The study subjects were selected based on year-based stratification, with the assumption that there is heterogeneity among the year of study. A cluster of two departments from each year (total of 6 departments) were selected randomly. After year based proportional allocation, the final study subjects were selected using a systematic sampling technique based on their list of names ordered alphabetically.

Data on independent and dependent variables were collected through a pretested structured, self-administered questionnaire. The independent variables included were socio demographic variables (age, sex, religion, marital status, who living with), and perceived parents economic status), sexual practices (ever had sex, age at first sex, number of sexual partners, ever had pregnancy, use of condom, contraceptives, ever had an abortion, ever had any STIs, ever tested for HIV, ever had sex with commercial sex workers (CSW), use of alcohol and others. The dependent variable measured was risky sexual practice that was defined as having at least one of the following: having sex with more than one person; having sex with commercial sex workers, being diagnosed with an incident STI in the past 3 months; having a partner who had sex with other people, or having a partner who is HIV positive.

The quality of data was assured through daily checking for completeness and consistency of the filled questionnaire, coding for easier tracking of any mistakes and cleaning before processing. The collected data were entered into Epinfo version 3 and later exported to SPSS version 16 for analyses. So that descriptive statistics were calculated, described and interpreted. The association between the dependent and independent variables was assessed using chi square test and p value less than 0.05 was used to declared statistical significance.

Ethical approval was sought from the Lancia campus of Central University College research review committee.

Besides, participants were notified that they have the right not to participate if they wish to as provided at the beginning of the questionnaire for which the subjects consented. Personal information like: name, phone number, etc were excluded from the questionnaire to ensure privacy and confidentiality of the information.

Result

Socio-demographic characteristics

A total of 181 subjects responded, giving a response rate of 91.8%. Among the respondents, 51.9% were females and 67.4% were aged between 20-24 years old with a mean and standard deviation of 22.1 and 2.8yrs respectively. The detail of socio-demographic characteristics of the respondents' is shown in Table 1.

Table1. Socio demographic characteristics of the respondents, Central University College (CUC), Addis Ababa, Ethiopia July 2012

Variable		Frequency	Percent
Age (yrs)	15-19	41	22.7
	20-24	122	67.4
	25 and above	18	9.9
	Total	181	100.0
Sex	Male	87	48.1
	Female	94	51.9
	Total	181	100.0
Study year	I	60	33.1
	II	65	35.9
	III	56	30.9
	Total	181	100.0
Marital status	Single	157	86.2
	Married	21	11.6
	Divorced	2	1.1
	Other	1	0.6
	Total	181	100.0
Live with parent	Yes	133	73.5
	No	48	26.5
	Total	181	100.0
Religion	Orthodox	108	59.7
	Muslim	47	26
	Protestant	19	10.5
	Catholic	5	2.8
	Other	2	1
	Total	181	100
Perceived parents economic status	Rich	35	19.3
	Middle	130	71.8
	Poor	16	8.9

Sexual and reproductive health characteristics of respondents

Among the respondents, 54% (52.9% male and 55.3% female) have had sex of whom 73.5 % practiced it willingly and 16.3% practiced it due to convincing gifts. About 32.6% had more than one sexual partner within the last three months before the survey that ranges from 1 to 9.

The mean and SD of age at first sex were 18.3 and 2yrs respectively. Nearly half (48.1%) of the students had practiced premarital sex and a considerable number of those who had sex (86.1%), had their first sex with their boy/girl friend and the rest had with a "sugar dady/mami"(in exchange for gifts) and commercial sex workers. The details are presented in Table 2.

Table 2 Sexual practices of respondents Central University College, Addis Ababa, Ethiopia July 2012

Variable		Frequency	Percent
Ever had sex	Yes	98	54.1
	No	83	45.9
	Total	181	100
Age at first sex	15-19	75	76.5
	20-25	23	23.5
	Total	98	100.0
Occasion first sex	Willing	72	73.5
	Forced	2	2.0
	Convinced with gift	16	16.3
	Took drug	5	5.1
	Felt threatened	1	1.0
	Other	2	2.0
	Total	98	100.0
Time first sex initiated	At high school	48	49.0
	After high school but before college	33	33.7
	During college first year	10	10.2
	Beyond first year college	7	7.1
	Total	98	100

Ten respondents (10.2%) (8 males and 2 females) had sex with a partner of the same sex and 16 (34 %) of the male respondents had their first sexual intercourse with commercial sex workers**.** Nearly one third (29.5%) had their first sexual intercourse after alcohol intake and only 37.7% of those who had sex have ever used a condom during sex. Of those who had sex only 40.3% used any method of contraceptive to prevent pregnancy, of whom 38 (95%) are currently using contraceptives. About 37 (39.3%) have been pregnant of whom 17(45.9%) had at least one abortion. A total of 12 (6.6%) has experienced STD and 32 (17.6%) think that they are at risk of HIV/AIDS or other STDs. Among the respondents 130 (71.8%) had been tested for HIV of whom 40(30.6%), 32(24.6) and, 42(32.3%) had been tested within 3,6 and more than 6 months ago respectively.

As shown in table 3, those students living with parents, perceived parents economic status, marital status, alcohol intake, age at first sex initiation and route of sexual intercourse are significantly associated with risky sexual practices. On the other hand, sex, current age and religion of the students are not significantly associated with risky sexual practices.

Table 3 Factors associated with risky sexual practices Central University College, Addis Ababa, Ethiopia July 2012

Variable		Risky sexu		x^2	P value
Sex	**Male**	**14**	**13**	**0.064**	**0.8**
	Female	**18**	**19**		
Current age group	15-19	2	6	3.7	0.29
	20-24	25	23		
	>25	5	2		
Live with parents	Yes	8	16	4.3	0.04
	No	24	16		
Marital status	Married	5	7	16.3	0.001
	Not marrie 1	31	18		
Religion	Orthodox	19	25	5.2	0.15
	Muslim	8	3		
	0ther*	3	6		
Age at first sex	15-19	30	21	7.9	0.019
	>20	6	11		
Perceived Parent economic status	Rich	9	2	7.8	0.04
	Middle	17	26		
	Poor	6	2		
Mode of sex	Vaginal	10	22	10.9	0.004
	Other**	24	9		
Drank alcohol	Yes	18	3	15.9	0.0001
	No	14	29		

*= Catholic, Protestant and traditional, **=Anal or oral

Discussion

The magnitude of sexually active students defined as those ever started sexual intercourse is 54%, which is consistent with the studies conducted in Nepal and different surveys in USA (18, 27) . However, it is higher than studies conducted in China and Spain (16, 27) that could be due to differences in socio-demographic characteristics and settings where the studies are conducted. Unlike many other studies conducted elsewhere, the study did not show significant difference among sexually active male and females (52.9% male and 55.3%) (16, 28-30). The mean age at which students initiated sex was 18.3years that is almost similar to the findings of studies conducted among Gondar preparatory students in Ethiopia and Chinese University students (28, 31)

Among those who had sex, 86.9% had their first sex with their boy/girlfriend, which is higher than that of a study in Nepal of about 55% (31) . This is also consistent with the majority (73.5%) of the current study which had their first sexual debut willingly. Forced /coerced sex among the study subjects (2%) is much lower than studies in sub-Saharan countries (13). These could be due to the possible differences between socio-cultural contexts of the study subjects.

Of the sexually active students, 34% had sex with a commercial sex workers, which is higher than a study conducted among preparatory students in Gondar and college students in Nepal (26,31) . Nearly one third (29.5%) among those who initiated sex drank alcohol before sex that is lower than a study conducted among Chinese college students (32). This could be explained by the difference in the alcohol intake practice in the communities of China and Ethiopia, which can directly influence the practice among the youths.

About 32.6% had more than one sexual partner within the last three months before the survey. This is lower than a study conducted among South African female students (12) that is possibly due to the time frame used to elicit information among the study subjects (life time versus 3 months). In the current study only 37.7% of those who had sex have ever used condoms during sex which is lower than a study among undergraduate Chinese students (29) .

The study revealed that students living outside of their parents' home and perceived parent's economic status are significantly associated with risky sexual practices. It is consistent with studies conducted in Nepal and China (29, 30). It was also indicated that those initiated sex at age below 20 yrs (lower ages) have more risky sexual practices than their counterpart which is consistent with the study among Chinese University students (32).

The study showed that only 40.3% of sexually active students used any method of contraception to prevent pregnancy that is lower than a study conducted in South Africa (89%) and higher than a study conducted in Tanzania (21.3%) (33,34). The difference could be due to differences in accessibility, acceptability and affordability of family planning services among the study areas. The study also indicated that about 39.3% of sexually active students had been pregnant, which is higher than a study conducted in Tanzanian youth (34). It was also revealed that 6.6% of those sexually active students have experienced STD and 17.6% think that they are at risk of HIV/AIDS or other STI. This is a bit lower than the findings of the study conducted among Chinese undergraduate students (13).

Since the study is cross sectional it was not able to examine the temporal relationship among dependent and independent variables. In addition, due to the small sample size, control of possible confounding variables with multiple regression analyses was not possible and there might be possible effects of confounding in the associations between variables. Since the findings are based on self reported responses, they are liable to different source of biases including recall and social desirability biases. Hence the findings should be interpreted and used considering the stated limitations.

Conclusion

The majority of the students in private higher institutions is sexually active and practicing a wide range of risky sexual practices, including having multiple sexual partners, having sex with commercial sex workers, having sex with the same sex and other than vaginal penetrative sexual intercourse. The factors associated with the risky sexual practices are related to the individual demographics and lifestyle, parents' characteristics and school environment. Therefore focused intervention involving students, parents and school administration should be designed and implemented to curb the prevailing risky practices. Furthermore, in depth studies involving large sample size and qualitative research should be conducted to explore more about the underlying factors with the risky sexual practices.

Acknowledgement

I would like to express my deepest gratitude to the staffs of Lancia campus Central University College and School of Public Health at Addis Ababa University for their Unreserved Support throughout the study period. I would like to thank Sheka Zone development office for the financial support of the thesis work. I am indebted to Christene Thorsen who carried out language edition. Last but not least I would like to thank the data collectors, supervisors and study subjects.

Author Contact: abyotas@yahoo.com

References

1. Family Health International: Adolescents, An Underserved Population. Meeting the Needs of Young Clients. In.; 2003.
2. O'Boyle: Improvement of sexual and reproductive health requires focusing on adolescents *Lancet* 2003, 362:831-832.
3. Dancy BL, Kaponda CP, Kachingwe SI, Norr KF: Risky sexual behaviors of adolescents in rural Malawi: evidence from focus groups *J Natl Black Nurses Assoc* 2006, 17(1):22-28.
4. Eaton L, Flisher AJ, Aaro LE: Unsafe sexual behavior in South African youth. *Soc Sci Med* 2003, 56 (1):149-165.
5. Monasch R, Mahy M: Young people: the centre of the HIV epidemic In.; 2006: 15-41.
6. Orji EO EO: Sexual behavior and contraceptive use among secondary school students in Ilesha South West Nigeria *Obstet Gynaecol* 2005, 25(3):269-270.
7. CDC: Young people at risk: HIV/AIDS among America's Youth. In.; 2002.
8. China Minstry of Health, UNAIDS, WHO: Update on the HIV/STD Epidemic and Response in China In. Beijing: China Ministry of Health; 2006.
9. Sexually transmitted diseases among American youth: incidence and prevalence estimates *Perspect Sex Reprod Health* 2004.
10. American College Health Assesement: National College Health Assessment 2007 reference group data report *J Am Coll Health* 2008.
11. SK H: Unintended pregnancy in the United States *Family Planning Perspectives 1998;30:24-* 1998, 30(24).
12. Manzini N: Sexual initiation and childbearing among adolescent girls in KwaZulu Natal, South Africa. *Reprod Health Matters* 2001, 9(17):44-52.
13. Ann M, Kofi A, Nyovani M, Johannes J, Akwasi K.: Coerced first sex among adolescent girls in sub-saharan africa: prevalence and context. *Afr J Reprod Health* 2007, 11(3):62-82.
14. Gavin L, Galavotti C, Dube H, McNaghten AD, Murwirwa M, Khan R, St Louis M: Factors associated with HIV infection in adolescent females in Zimbabwe. *J Adolesc Health* 2006.
15. S B: Gender differences in the factors influencing consistent condom use among young people in Tanzania. *Int J Adolesc Med Health* 2006, 18(2):287-298.
16. J Bova C, Fennie KP, Rogers A, Williams AB: Knowledge, attitudes, behaviors and perceptions of risk related to HIV/AIDS among Chinese University students in Hunan, China. *AIDS Patient Care STDS* 2005, 19:769-777.
17. Barnett T, J. P: HIV/AIDS: sex, abstinence, and behavior change. *The Lancet Infectious Diseases* 2005, 5 (9):590-593.
18. Adhikari Ramesh, Tamang Jyotsna: Premarital Sexual Behavior among male college students of Kathmandu, Nepal *BMC Public Health* 2009.
19. Megan E., Patrick, Christine M. Lee: Sexual Motivations and Engagement in Sexual Behavior During the Transition to College *Arch Sex Behav* 2010, 39(3):674-681.
20. Astale T: Substance Use, Sexual Orientation and Risky Sexual Behaviors for HIV infection Among Bahir Dar University Students. North-West Ethiopia (Masters thesis): Jimma University; 2010.
21. Tefera B, Challi J, Yoseph M: Knowledge, attitude and practice about HIV/AIDs, voluntary counseling and testing among students of Jimma University, Jimma zone, Southwest Ethiopia. Ethiop J Health Sci. 2004,14:43–53.

22. Beyan N: Predictors of Condom use by using Health belief Model among Haramaya University Students (Masters thesis). Haramaya University; 2005.
23. Fitaw Y, Worku A: High risk sexual behavior and pattern of condom utilization of the Gondar College of Medical Sciences students, North Western Ethiopia. Ethiop J Health Dev 2002, 16(3):335–338.
24. Mengistu TS, Melku AT, Bedada ND, Eticha BT: Risks for STIs/HIV infection among Madawalabu university students, Southeast Ethiopia: a cross sectional study. *Reproductive health* 2013, 10:38.
25. AIDS Resource Center Ethiopia: Modeling and Reinforcement to Combat HIV/AIDS (MARCH) In.: AIDS Resource center.
26. Ismail Shabbir , Bitsuamlak Habtea , Kahsu A: High Risk Behaviors for STD/HIV, Pregnancies and Contraception among High School Students in Rural Town,North Western Ethiopian. *Ethiopian Journal of Health Development* 1997, 11:29-36.
27. Diana Puentea, Edurne Zabaletaa, Teresa Rodríguez-Blancoa, Marta Cabanasa, Mònica Monteagudoa, Maria Jesús Pueyob, Mireia Janéc, Núria Mestrec, Mercè Mercaderb: Gender differences in sexual risk behavior among adolescents in Catalonia. *Spain Gac Sanit* 2011, 25(1):13-19.
28. Zhang Beck EJ.: Changing sexual attitudes and behaviors in China: Implications for the spread of HIV and other sexually transmitted diseasesn *AIDS Care* 1999, 11:581-589.
29. Hong Yan, Weiqi Chen, Haocheng Wu, Yongyi Bi, Miaoxuan Zhang, Shiyue Li, Braun KL: Multiple sex partner behavior in female undergraduate students in China: A multi-campus survey *BMC Public Health* 2009, 9:305.
30. Qiaoqin Ma, Masako Ono-Kihara, Liming Cong, Guozhang Xu, Xiaohong Pan, Saman Zamani, Shahrzad Mortazavi Ravari, Dandan Zhang, Takayuki Homma, Masahiro Kihara: Early initiation of sexual activity: a risk factor for sexually transmitted diseases, HIV infection, and unwanted pregnancy among university students in China BMC Public Health. *9* 2009:111.
31. UNAIDS, UNICEF: Survey of Teenagers in Seven Districts of Nepal. Kathmandu, Nepal In.; 2001.
32. Liming Cong, Masako Ono-Kihara, Guozhang Xu, Qiaoqin Ma: The characterization of sexual behavior in Chinese male university students who have sex with other men: A cross-sectional study *BMC Public Health* 2008, 8:250.
33. Liming Cong, Masako Ono-Kihara, Guozhang Xu, Ma Q: The characterization of sexual behavior in Chinese male university students who have sex with other men: A cross-sectional study *BMC Public Health* 2008, 8:250.
34. W Urassa, C Moshiro, G Chalamilla, F Mhalu, Sandstrom E: Risky sexual practices among youth attending a sexually transmitted infection clinic in Dar es Salaam, Tanzania *BMC Infectious Diseases* 2008, 8:159.

ORIGINAL ARTICLE

Readiness of Health Centers to Provide Basic Emergency Obstetric and Newborn Care in Eight Districts of SNNPR, Oromia and Amhara Regions of Ethiopia, 2013

Biniam Getachew[1], Yirgu G/Hiwot[2]

Abstract

Background: *The results from an Ethiopian national baseline assessment for Emergency Obstetric and Newborn Care (EmONC) Performed in 2008 clearly shows poor access and utilization of EmONC services, very low critical life-saving servicesand poor quality of health care services as evidenced by high still birth rates in most regions of the country with the exception of Addis Ababa, Gambella and Somali.*

Methods: *An institution based cross sectional descriptive study was conducted from March to April 2013 at 48 health centers in eight districts in Ethiopia. An interviewer administered questionnaire and observation checklist was used to collect standardized data from participating health centers that focused specifically on maternal and newborn health services at each of the facilities.*

Results: *The majority of health centers, 95.8% (46/48) were open to provide labor and delivery service 24 hours a day, 7 days a week. However, only 11.5% (47/410) of health workers in the study catchment area had previously received in-service training in Basic Emergency Obstetric and Newborn Care (BEmONC). The partograph was not used routinely to monitor labor in 48% (23/48) of the health centers. One fourth (12/48) of health centers had a vacuum extractor and/ or obstetric forceps for assisted delivery, but 3 health centers reported never having used this equipment. One third, 33.3% (16/48) of health centers had manual vacuum aspiration (MVA) sets to provide services related to abortion care. Magnesium sulphate was available only in 10.4% (5/48) of health centers to treat a laboring mother with convulsions.*

Conclusions and recommendations: *Results suggest that although the majority of the health centers participating in the study provide delivery services, quality of BEmONC services and availability of supplies and equipment were questionable. Most health centers don't practiced administration of parenteral antibiotics, MVA, assisted vaginal delivery and other essential services. Effort should be made at all health centers across Ethiopia to increase the availability of essential drugs, equipment and supplies for the provision BEmONC service* **Ethiopian Journal of Reproductive Health, 2014, Volume 7(1), 11-21).**

Key words: *Basic Emergency Obstetric and Newborn Care, Maternal health, Neonatal*

[1]Ethiopian Society of Obstetricians and Gynecologists, [2] Department of Obstetrics and Gynecology, School of Medicine, AAU

Introduction

Globally, the maternal mortality ratio declined by 47 per cent over the last two decades, from 380 maternal deaths per 100,000 live births to 210 between 1990 and 2013.One of the eight Millennium Development Goals (MDGs) that has made some progress, albeit slow, is MDG 5: Improve maternal health (1).

Sub-Saharan Africa as a whole has the world's highest maternal mortality ratio which increased from 23% in 1980 to 52% in 2008, due in part to a contraceptive prevalence of only 25 per cent, and low levels of skilled attendance at birth (2, 3). Results from Ethiopian national baseline assessment for Emergency Obstetric and Newborn Care (2008) demonstrate poor access and utilization of Emergency Obstetric and Newborn Care (EmONC) services, very low critical life-saving services and poor quality of health care services as evidenced by high still birth rates in the majority of the regions with the exception of Addis Ababa, Gambella and Somali (4).

Basic EmONC facilities are consistently not available in sufficient numbers in countries with moderate to high maternal mortality levels (4). The policy in Ethiopia is that health centers are expected to fully function as a basic EmONC (BEmONC) centers. A facility is recognized as a BEmONC service availability is defined by having performed the seven, globally accepted, essential medical interventions (known as signal functions) in the previous three months of evaluation. The BEmONC signal functions are parenteral antibiotics; parenteral uterotonics; parenteral anticonvulsants; removal of retained products; manual removal of placenta; assisted vaginal delivery; and neonatal resuscitation (4, 5).The provision of a facility for EmONC, coupled with a functional ambulance transfer system for patients, is associated with a rapid and substantial reduction in maternal mortality (6).

The Ethiopian Society of Obstetricians and Gynecologists (ESOG) conducted a BEmONC needs assessment of health centers in eight rural districts of Ethiopia as part of the Women And Their Children's Health (WATCH) Program. WATCH uses a community-based approach to improve the quality of community outreach and MNCH services, while encouraging health-seeking behaviours and improved health care management to reduce the three delays for patients to seek care and to save the lives of more mothers and their children. The WATCH program is being implemented in five countries of Bangladesh, Ethiopia, Ghana, Mali and Zimbabwe and is supported through Foreign Affairs, Trade and Development Canada (DFATD).

This study aims to determine the availability, utilization and quality of BEmONC service in all health centres in the WATCH catchment area of Ethiopia with the objective to propose an appropriate approachto improve maternal, newborn and child health service in rural communities.

Methods

An institution based cross sectional descriptive study was conducted in March and April 2013 among all 48 health centers participating in the WATCH project of eight rural districts in three regions of Ethiopia, namely: **Amhara Region** (Lasta, Bugena andMeket districts), **Oromia Region** (TiroAfeta andKersa districts) and **SNNPR Region** (Shebedino, Gorche and Bona Zuria districts).

An interviewer-administered questionnaire and observation checklist which was used in a previous ESOG project was adapted to collect the data from the study health centers specific to maternal and newborn health department. The questionnaire collected data on the health center's background, perinatal services performed, availability of equipment and medical supplies, referral system and human resources.

Trained data collectors conducted the interview with the head of the health center or representative and the principal investigator supervised the data collection. As the questionnaire was adapted from a previous project and pretested at that time, there was no need to pretest the tool but some adjustments were made to ensure that it fit with the current study objective.

Every filled questionnaire was checked for completeness and consistency to ensure quality of data. The data was cleaned, then entered and analyzed by using EXCEL and SPSS version 16. Aggregate data were prepared for each district and availability of BEmONC services are presented using table and graphs. Ethical clearance was obtained from ESOG and district health offices prior to the study.

Results

Of the 48 health centers assessed in this study 11 health centers from Oromia Region (Jimma Zone), 19 health centers from Amhara Region (North Wollo Zone) and 18 health centers from SNNPR (Sidama Zone).

Facility Infrastructure

The majority of the health centers, 85.4% (41/48) had separate delivery or labor rooms while 75% (36/48) had additional post-delivery rooms. Around 75% of the health centers had an examination room that ensured a client's privacy during consultation and 33.3% of health centers had a designated newborn resuscitation area. Six health centers from Sidama Zone did not have a refrigerator for cold chain purposes. Incinerators were found only in 64.6% (31/48) of all health centers.

Only 31.2% (15/48) of the health centers had running water which made it difficult to practice standard infection prevention procedures and to provide other basic services. In order to ensure water on site, water was generally purchased through small local businesses that procure water or collected and stored through the health centers rain barrels. More than half of the health centers, 56.2% (27/48) had no electricity or generator, which results in health care providers using either their torch or the light on their cell to conduct deliveries during the night (Table 1).

Table 1: Availability of infrastructure in 48 health centers by district, Ethiopia, 2013

Infrastructures	Shebedino (N=9)	Gorche (N=5)	Bona Zuria (N=4)	Lasta (N=6)	Bugna (N=4)	Meket (N=9)	Tiro-afeta (N=5)	Kersa (N=6)	Total (N=48)/ Percent (%)
Water supply	1	0	1	4	2	2	3	2	15(31.3%)
Toilet facilities or latrine	7	5	4	6	4	9	5	6	46(95.8%)
Generator and/or electricity	3	4	2	5	2	6	2	3	27(56.2%)
Emergency light or lamp	2	3	1	1	2	2	1	0	12(25%)
Telephone or radio transmitter	0	0	0	0	0	1	0	3	4(8.3%)
Autoclave	4	4	1	6	3	9	5	6	38(79.2%)
Examination room or area providing client privacy (room for screening, counseling and examination)	7	4	4	4	2	7	3	5	36(75%)
Delivery or labor room with bed and lighting	7	4	4	6	3	8	4	5	41(85.4%)
New born resuscitation area	5	2	2	1	0	2	1	3	16(33.3%)
Post-delivery room	7	4	4	4	0	7	4	6	36(75%)
Storage area or cupboard for drugs and other supplies	6	3	2	6	2	6	3	5	33(68.7%)
Refrigerator	5	5	2	6	3	9	5	6	41(85.4%)
Incinerators	3	2	1	6	1	9	5	4	31(64.6%)

Health workers

Of all health workers in the study area, only 11.5% (47/410) had received in-service training in BEmONC service delivery. Bona Zuria and Kersa districts had no health care professional trained in BEmONC.

From 52 midwives, almost half of the midwives (25/52) in the facilities had in-service BEmONC training while only one of the available 40 health officers had been trained to provide BEmONC (Table 2).

Table 2: Availability of technical staff and BEmONC trained staffs in 48 health centers by district, Ethiopia, 2013

District	Midwives		Nurse		Health Officer		Total	
	Available	BEmONC trained	Available	BEmONC trained	Available	BE-mONC trained	Available	BEmONC trained
Shebedino	13	8	76	18	12	1	101	27(26.7%)
Gorche	6	1	43	2	3	0	52	3(5.8%)
Bona Zuria	5	0	34	0	2	0	41	0
Lasta	5	4	46	0	4	0	55	4(7.2%)
Bugna	4	3	26	0	2	0	32	3(9.4%)
Meket	11	7	47	1	8	0	66	8(12.1%)
Tiro-afet	7	2	25	0	5	0	37	2(5.4%)
Kersa	1	0	21	0	4	0	26	0
Total	52	25	318	21	40	1	410	47(11.5%)

Availability of service

Most health centers, 95.8% (46/48) were open to the public to provide labor and delivery service 24 hours a day, 7 days a week. Two of the health centers were very new and were only able to provide clinical care during office hours. Basic laboratory service was available in 51% of health centers but only from 8am to 4pm daily. In the remaining 49% of health centers' microscope was only functional when sunlight is available or generator is on, so that they can't provide the service 24 hours a day.

Use of partograph

The partograph was not routinely used to monitor labor in 48% (23/48) of health centers (Table 3). Seventy three percent (35/48) of the health centers had a sufficient amount of partographs to use for the next six months.

Table 3: Routine use of Partograph in 48 health centers, Ethiopia, 2013

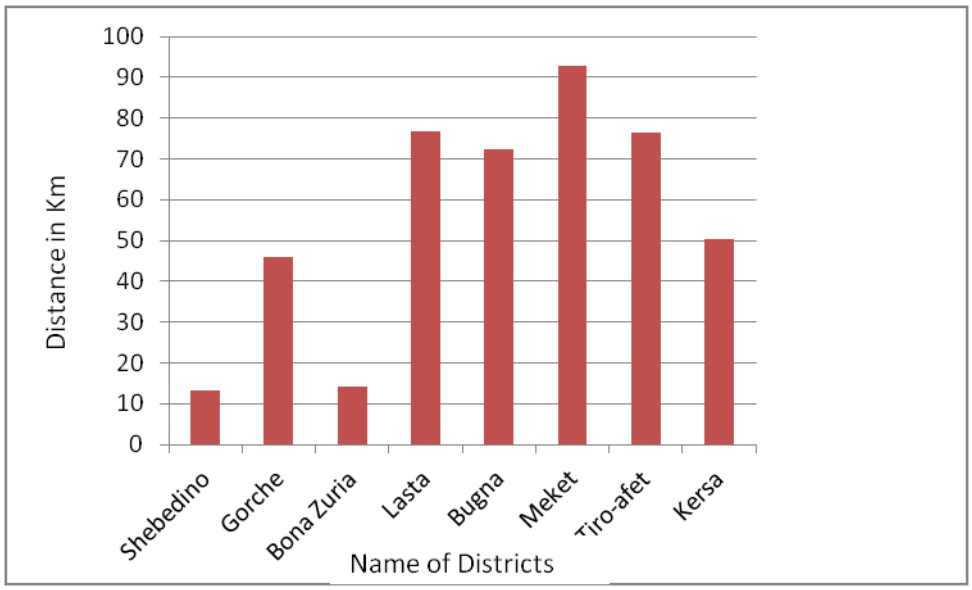
District	No. of Health centers use Partograph routinely	Percent %
Shebedino (n=9)	5	55.6
Gorche(n=5)	1	20.0
Bona Zuria(n=4)	1	25.0
Lasta (n=6)	5	83.3
Bugna(n=4)	2	50.0
Meket (n=9)	6	66.7
Tiro-afet (n=5)	3	60.0
Kersa (n=6)	2	33.3
Total (n=48)	25	52.1

Referrals

One ambulance was available 24 hours a day, seven days a week, in each district except for Gorche and Kersa. Only four health centers (one from Meket and three from Kersa district) had an office phone available to use to assist a referral when needed (Table 1). The majority of health centers relied on the staff's or client's mobile phone to communicate with higher level of health facility or to call the ambulance. Interestingly, none of the health centers or district health office's had a policy in place to reimburse staff who use their cell phone for work purposes.

Health centers from Sidama Zone (Shebidon, Gorche and Bona Zuria) had, on average, the shortest distance to reach a Comprehensive Emergency Obstetric and Newborn Care (CEmONC) facilities and North Wollo Zone had the longest. Average distances in North Wello Zone by district were 77 km (Lasta), 72 km (Meket), and 80 km (Bugna) (Figure one).

Figure 1: Average distance of 48 health centers, in kilometers, to CEmONC facility, Ethiopia, 2013



Availability of Drugs, Equipment and Supplies

There were many essential drugs, equipment and supplies for the provision BEmONC that were not available at the health centers.

Equipment and supplies for newborn care

Only 33.3% (16/48) of health centers had a newborn resuscitation area to save the life of neonate born with some complications. Almost all health centers had baby weight scale and umbilical cord ties either in the delivery room or nearby in the health center.

Bag and mask to assist ventilation and mucus extractors were available in 47.9% (23/48) and 66.7% (32/48) health centers respectively. Vitamin K injection was available in only five health centers but there was insufficient stock of these supplies in these five health centers. Most health centers, 89.6% (43/48) are able to provide Tetracycline 1% eye ointment for the newborn to prevent neonatal conjunctivitis.

Table 4: Availability of essential equipment, supplies and drugs for newborn care in 48 health centers, by district, Ethiopia, 2013

Equipment, supplies and drugs for newborns	n facilities where items present								
	Shebedino (N=9)	Gorche (N=5)	Bona Zuria (N=4)	Lasta (N=6)	Bugna (N=4)	Meket (N=9)	Tiro-afeta (N=5)	Kersa (N=6)	Total (N=48)/%
New born resuscitation corner	5	2	2	1	0	2	1	3	16 (33.3%)
Bag and Mask ventilator	6	2	2	3	1	5	2	2	23(47.9%)
Mucus extractor/ suction catheter	5	4	3	5	1	8	3	3	32(66.7%)
Tetracycline 1% eye ointment	7	5	4	6	3	8	5	5	43(89.6%)
Vitamin K ampoules	0	1	0	0	0	3	0	1	5(10.4%)
Rectal thermometer	0	0	0	2	0	2	0	1	5(10.4%)
Baby weight scale	7	5	4	5	2	8	5	6	42(87.5%)
Umbilical Cutter	7	4	3	0	2	2	2	3	23(47.9%)
Umbilical Cord tie	7	5	4	5	4	9	3	5	42(87.5%)
New Born Coach	5	1	3	4	0	6	2	4	25(52.1%)

Essential equipment and supplies for maternal health service

All health centers, except for two in Shebedino district, were equipped with essential items needed for provision of labour and delivery care. BEmONC medication and supplies were available 24 hours a day, seven days a week, in 95.8% of health centers. Almost all health centers had a standardized delivery, antenatal care and family planning registration book. None of health centers had job aids or guidelines for the clinical management of labor and complications to assist health care providers in their health centers. One fourth (12/48) of health centers had a vacuum extractor and/or obstetric forceps for assisted delivery but three of these health centers reported never having used this equipment. One-third, 33.3% (16/48) of health centers had manual vacuum aspiration (MVA) sets to provide care related to abortion. 75% (36/48) of health centers had vaginal speculums available of different sizes (Table 5).

Availability of antibiotics

Most of health centers did not have sufficient stocks of IV antibiotics. Procaine penicillin, Gentamycin and Ceftriaxone were available in 89.6% (43/48), 83.3% (40/48) and 50% (24/48) of health centers, respectively. Metronidazole and choloroamphenicol (CAF) were not available in any of the health centers.

Availability of anti-hypertensive and anti-convulsive medications

More than half, 58.3% (28/48) of health centers had methyldopa and 29.2% (14/48) of health centers had hydralazine to treat pregnancy-induced hypertension. None of health centers had nifedipine. Although magnesium sulphate is the medication of choice in the treatment of convulsions, it was available only in 10.4% (5/48) of health centers. As such, 50% (24/48) of health centers use Diazepam (Table 6).

Availability of oxytocic drugs

Misoprostol was available in only seven health centers for the management of safe abortion and it was reported that it is never used during labor and delivery. In the health centers, 91.6% and 64.5% had oxytocin and ergometrine respectively, to use for mothers that give birth in their facility. Three health centers use the nearest health post to store their supply of oxytocin in their refrigerator.

Availability of disinfectant/antiseptic

Chlorine solution was used in 62.5% (30/48) of health centers for disinfection but the stock on hand was not sufficient for the next six months in all of the health centers. More than one third, 37.5% (18/48) of health centers had soap for hand washing but the amount of soap was not more than ten pieces (Table 7).

Availability of infection prevention items

Apron, boots, goggles and masks were available in 62.5% (30/48), 27% (13/48), 39.6% (19/48) and 25% (12/48) of the health centers, respectively. Surgical glove were available at 93.8% (45/48) of health centers which is crucial to attend delivery service. At the time of data collection, surgical gloves were stocked out at three health centers.

Table 5: Availability of BEmONC equipment and supplies in WATCH health centers by district, Ethiopia, 2013

BEmONC Equipment and Supplies	n facilities where items present								Total (N=48)/%
	Shebedino (N=9)	Gorche (N=5)	Bona Zuria (N=4)	Lasta (N=6)	Bugna (N=4)	Meket (N=9)	Tiro-afeta (N=5)	Kersa (N=6)	
Delivery bed	7	5	4	6	4	9	5	6	46(95.8%)
Copies of partograph	5	2	1	6	4	8	5	4	35(72.9%)
Clinical management guidelines of labor	0	0	0	0	0	0	0	0	0(0)
Delivery register or log book	7	5	4	6	4	9	5	5	45(93.8%)
Antenatal care register or log book	7	5	4	6	4	9	5	6	46(95.8%)
Family planning register or log book	7	5	4	6	4	9	5	5	45(93.8%)
BP apparatus	7	5	3	4	2	8	5	6	40(83.3%)
Stethoscope	7	5	4	6	3	8	5	6	44(91.7%)
Fetoscope	7	5	4	6	4	9	5	6	46(95.8%)
Syringes with Needles	7	5	3	6	4	8	5	5	43(89.6%)
IV cannulas	7	4	4	5	3	8	4	5	40(83.3%)
Suture Material (set)	7	4	4	6	2	9	3	6	41(85.4%)
Cord clamps/ ligature	7	4	3	0	1	2	3	3	23(47.9)
Vaginal Speculum	7	5	3	5	1	8	3	4	36(75%)
Manual vacuum aspirator set	7	2	2	0	0	1	1	3	16(33.3%)
Vacuum (ventouse) and/or Forceps	4	0	1	3	0	3	1	0	12(25%)
Urinary catheter	6	3	2	5	3	7	2	5	33(68.8%)

Table 6: Availability of essential BEmONC drugs in WATCH health centers by districts, Ethiopia, 2013

Essential drugs	n facilities where items present								
	Shebedino (N=9)	Gorche (N=5)	Bona Zuria (N=4)	Lasta (N=6)	Bugna (N=4)	Meket (N=9)	Tirofeta	Kersa (N=6)	Total (N=48)/%
Antibiotics									
Ampicillin	6	5	4	5	3	4	5	5	37(77.1%)
Benzathine PCN or Procaine Benzylpenicillin	7	5	4	4	2	7	4	5	38(79.2%)
Ceftriaxone	4	3	3	5	2	6	1	0	24(50%)
Gentamycin	7	5	4	5	3	8	3	5	40(83.3%)
Metronidazole	7	5	4	4	4	9	3	5	41(85.4%)
Procaine Penicillin G	7	5	4	6	4	8	4	5	43(89.6%)
Penicillin G	5	4	4	1	2	5	2	3	26(54.2%)
Anti-hypertensives									
Methyldopa	5	4	4	3	4	4	1	3	28(58.3%)
Hydralazine or Labetalol	0	2	1	2	2	3	1	3	14(29.2%)
Nifedipine	0	0	0	0	0	0	0	0	0
Anti-Convulsives or Sedatives									
Magnesium sulfate	3	0	2	0	0	0	0	0	5(10.4%)
Valium/diazepam	3	4	2	1	0	7	3	4	24(50%)
Phenobarbital	3	1	2	1	0	6	2	3	18(37.5%)
Oxytocics									
Misoprostol	1	1	0	0	0	0	1	4	7(14.6%)
Ergometrine	5	2	2	4	2	8	3	5	31(64.6%)
Oxytocin	7	5	4	6	3	9	5	5	44(91.7%)
IV Fluids									
Glucose (5%, 10%, 50%)	7	4	4	6	2	8	2	4	37(77.1%)
Normal Saline	7	5	4	5	3	5	2	5	36(75%)
Ringer's Lactate	7	5	4	5	4	7	3	5	40(83.3%)
Emergency									
Adrenaline	7	4	4	3	3	6	1	4	32(66.7%)
Atropine	1	0	0	3	3	6	1	2	16(33.3%)

Table 7: Availability of infection prevention supplies in WATCH health centers by district, Ethiopia, 2013

Infection prevention supplies	n facilities where items present								
	Shebedino (N=9)	Gorche (N=5)	Bona Zuria (N=4)	Lasta (N=6)	Bugna (N=4)	Meket (N=9)	Tirofeta (N=5)	Kersa (N=6)	Total (N=48)/%
Disinfection/Antiseptics									
Chlorine solution	6	4	2	4	3	6	2	3	30(62.5%)
Soap	6	3	2	2	1	0	0	4	18(37.5%)
Alcohol	7	5	2	2	2	6	2	4	30(62.5%)
Iodine	6	4	2	6	3	4	0	4	29(60.4%)
Infection prevention items									
Boots	1	2	1	2	1	4	2	0	13(27.1%)
Apron	5	2	1	5	1	7	3	6	30(62.5%)
Goggles	4	2	1	6	1	1	1	3	19(39.6%)
Masks	3	2	2	2	0	1	0	2	12(25%)
Caps	2	2	1	2	0	0	0	0	7(14.6%)
Heavy duty gloves	3	5	1	4	2	8	2	5	30(62.5%)
Surgical glove (box)	7	5	4	6	4	9	5	5	45(93.8%)
Disposal gloves (box)	7	5	4	6	4	9	5	5	45(93.8%)
Refuse disposal with cover	1	1	1	1	0	4	1	1	10(20.8%)

Discussion

This study focused on BEmONC service provision, infrastructure and availability of essential drugs and supplies. The provision of quality EmONC not only depends on skilled personnel, but also on the availability of essential drugs and supplies for EmONC (7).

An experience of CARE in areas of high maternal mortality in Africa showed that health centers provided elements of basic EmONC in varying degrees (8) which is similar with the findings of this study that health centers were providing BEmONC signal functions in varying magnitude.

Partograph review was used to determine how many facilities actually used the partograph and to assess the completeness of the record. This study showed that 58% of health centers were using partograph routinely to monitor laboring. A study done in Addis Ababa showed 57.3% of obstetric care givers at public health institutions reportedly utilized Partograph (9). A study done in hospital in Ethiopia revealed that partograph was used in 37% of facilities(10). A similar study done in Tanzania showed 69% of health center used partograph (11), which is close with this study finding. This shows that all health centers did not give proper attention for Partograph utilization.

A baseline assessment for EmONC in 2008 in Ethiopia showed 40% of health facilities practiced newborn resuscitation (12). In Tanzania 29% of health facilities used newborn Ambubag to save life of neonates (11). The finding of this study indicates newborn resuscitation is among the commonly missed BEmONC services which need to be given due emphasis.

The importance of availing MVA in primary care settings was shown in the study done in Uganda (12) in that study the relation of removal of retained product of conception to maternal death has an odds ratio of 4.6.

In our baseline assessment only one third of health centers have manual vacuum aspirator (MVA) set to provide service related to abortion care. The role health centers play in availing CAC cannot be underestimated.

Assessment of EMOC in Malawi revealed poor quality of care, which is attributable partly to absence of skilled birth attendants and motivated staff, and the frequent shortage of drugs and medical supplies (15).In south west Ethiopia where high level of home delivery witnessed the attributes with the greatest influence on the overall utility of a health facility for delivery were availability of drugs and equipment seeing a doctor and a receptive provider attitude (16). The lack of essential commodities lack magnesium sulfate and vacuum and forceps for assisted delivery may have serious impact on services utilization.

Conclusion and recommendation

Results suggest that although the majority of the health centers participating in the study provide delivery services, although the qualityof BEmONC servicesand availability of supplies and equipmentwere questionable.Most of health centers don't practiceadministration of parenteral antibiotics, MVA, assisted vaginal delivery and other essential services. Most of health care providers need training to refresh their knowledge on maternal and child health services.

Based on the results of this assessment the following interventions were identified and implemented during late 2013 to mid-2014:

- Improvements to facility infrastructure, through purchase of refrigerators, construction of incinerators, etc;
- Improvements to referrals, through provision of airtime for referrals by mobile phone and fuel for maternity ward ambulances;
- Capacity building of health care providers through training and supportive supervision; and

- Significant investment in the provision of essential drugs, equipment and supplies to 54 health centers including the 48 health centers originally assessed in this study.

These efforts were made within the WATCH program to increase the availability of essential drugs, equipment and supplies for the provision of BEmONC service and improve the quality of the service. Simultaneously, community education was also conducted by local NGOs to inform communities of the improvements to the service delivery as well as to the importance of women obtaining health care during pregnancy and at time of delivery.

It was reported that between January and March 2014, approximately 11,372 women in the WATCH catchment areas accessed and utilized MNCH services (having received a total of four antenatal visits and/or used a skilled birth attendant at time of delivery). Project monitoring trends indicate increases to MNCH services usage and at the time of this publication the project is being evaluated through an end line assessment.

The intervention made within the WATCH program demonstrates the efforts which should be made at all health centers across Ethiopia to increase the availability of essential drugs, equipment and supplies for the provision of quality BEmONC services.

Acknowledgment

We would like to acknowledge ESOG Board members and Plan International – Ethiopia WATCH project teams who facilitated this study. The advisory contribution of Moya Crangle and Dr. Mehdi Bekri was also invaluable in the process of this study. We are also grateful for the financial support of Foreign Affairs, Trade and Development Canada (DFATD) through Plan Canada and SOGC which made this study possible.

Author Contact: biniongech@yahoo.com

Reference

1. World Health Organization. Trends in Maternal Mortality: 1990 to 2013. WHO, UNICEF, UNFPA, and The World Bank. World Health Organization, 2014.
2. United Nation. The Millennium Development Goals Report 2013, 2013.
3. Margaret H, Kyle F, Mohsen N, Stephanie A, Mengru W, Susanna M, Alan L, Rafael L, Christopher M. Maternal mortality for 181 countries, 1980–2008: a systematic analysis of progress towards Millennium Development Goal 5. Lancet 2010; 375: 1609-23.
4. Admasu K, Haile-Mariam A, Bailey P. Indicators for availability, utilization, and quality of emergency obstetric care in Ethiopia. Int J GynecolObstet 2011; 115:101-105.
5. Paxton A, Bailey P, Lobis S, Fry D. Global patterns in availability of emergency obstetric care. Int J GynecolObstet 2006; 93: 300-91.
6. World Health Organization. The World Health Report 2013: Research for Universal Health Coverage, 2013.
7. UNFPA. Emergency Obstetric Care. Providing Emergency Obstetric and Newborn Care to All in Need. http://www.unfpa.org/public/mothers/pid/4385
8. Kayongo M, Rubardt M, Btera J, Abdullah M, Mboninyibuka D, Madili M. Making EmOC a reality – CARE's experiences in areas of high maternal mortality in Africa. Int J GynecolObstet 2006; 92: 308 – 319.
9. Yisma E, Dessalegn B, Astatkie A, Fesseha N, Knowledge and utilization of partograph among obstetric care givers in public health institutions of Addis Ababa, Ethiopia. BMC Pregnancy and Childbirth 2013 13:17.
10. Ashebir G, Ricca J, Cantor D, Rawlins B, Rosen H, Alemnesh T, Bartlett L, Gibson H. Quality of care for prevention and management of common maternal and newborn complications: A study of Ethiopian's Hospitals. MCHIP, 2011.
11. Penfold S, Shamba D, Hanson C, Jaribu J, Manzi F, Marchant T, Tanner M, Ramsey K, Schellenberg D, Armstrong J. Staff experiences of providing maternity services in rural southern Tanzania – a focus on equipment, drug and supply issues. BMC Health Services Research 2013 13:61.
12. Mbonyea A, Asimweb J, Kabarangirac J, Nandad G, Orinda V. Emergency obstetric care as the priority intervention to reduce maternal mortality in Uganda. Int J GynecolObstet 2007; 96: 220-225.
13. FMOH, UNICEF, UNFPA, WHO, AMDD. National Baseline Assessment for Emergency Obstetric and Newborn Care: Ethiopia, 2008. Final Report; 2009.
14. Sarah R, Sisay M, Kelemua H, Ian A, Annabela E. Assessment of availability and use of maternal health supplies in the primary health care system in Amhara Region, Ethiopia. Final report, Population Council, 2013.
15. Bailah L, Theresa G, Dorothy L, Juliana L. Emergency obstetric care: How do we stand in Malawi. Int J GynecolObstet 2008; 101: 107 – 111.
16. Kruk M, Paczkowski M, Tegegn A, Tessema F, Hadley C, Asefa M, Galea S. Women's preferences for Obstetric care in rural Ethiopia: a population-based discrete choice experiment in a region with low rate of facility delivery. J Epidemiol Community Health 2010; 64:984-988.

ORIGINAL ARTICLE

Maternal and perinatal outcomes of pregnancies complicated by eclampsia at Tikur Anbessa Hospital - A five year retrospective study

[1]Anbesse Jima, [2] Eyasu Mesfin

Abstract

Introduction: *Eclampsia is an important and mostly preventable cause of maternal and perinatal morbidity and mortality. Its incidence varies from 4 - 6 cases per 10,000 live births in developed countries to 6 - 100 cases per 10,000 live births in developing countries. Maternal complications occur in up to 70% of women with Eclampsia.*

Objective: *To describe perinatal and maternal outcome of eclampsia in Tikur Anbessa Hospital and explore avoidable factors contributing to the adverse outcome.*

Methods: *A hospital – based retrospective, cross sectional study of all eclamptic mothers admitted to Tikur Anbessa Hospital (TAH) in the time period of Meskerem 1, 1996 - Nehase 30, 2000 E.C. The main outcome measures were maternal and perinatal mortality & morbidities from Eclampsia.*

Results: *During the study period, there were a total of 13,606 deliveries in TAH, of which 78 were eclamptic mothers making a prevalence of 5.7/1000 deliveries. Majority of convulsions (94.37%) occurred during the antepartum period. Aspiration pneumonia was the commonest maternal complication (34.3%), followed by HELLP syndrome (15.8%). The case fatality of Eclampsia in this study was 11.9% (8/67). And of total 71 babies, 20 (28.2%) of them were still births and four (5.6%) were ENND, making a perinatal mortality rate 338/1000 deliveries.*

Conclusions and recommendations: *Eclampsia is still a common complication of pregnancy and one of the important causes of maternal and perinatal mortality in our set up. Further study on the subject preferably prospective with larger sample size is recommended to further assess the condition and improve its generalizability.* **(Ethiopian Journal of Reproductive Health, 2014, Volume 7(1), 22-30).**

[1&2] Department of Obstetrics and Gynecology, School of Medicine, AAU, Addis Ababa

Introduction

Eclampsia, defined as occurrence of seizures during pregnancy or within 10 days of delivery in a setting of pre eclampsia, remains to be a leading cause of maternal and perinatal morbidity and mortality (1). The incidence of eclampsia has been relatively stable at 4 to 6 cases per 10,000 live births in developed countries. In developing countries, however, the incidence varies widely: from 6 to 100 cases per 10,000 live births (1). An eclamptic seizure occurs in approximately 0.5 percent of mildly preeclamptic women and 2-3 percent of severely pre-eclamptic women (2). According to World Health Statistics 2012 released by the World Health Organization: every year some 287 000 women die of complications during pregnancy or childbirth globally, 18% of these maternal deaths are due to hypertensive disorders of pregnancy, particularly eclampsia (3).

About a century ago eclampsia was a major cause of maternal mortality in developed countries. The steep decline in case fatality rate in these countries is mainly due to better perinatal care; effective treatment of pregnancy induced hypertension and rigorous assessment with early intervention. Maternal complications occur in up to 70% of women with eclampsia and include abruptio placenta, disseminated intra vascular coagulopathy, acute renal failure, hepatocellular injury, intracranial hemorrhage, aspiration pneumonia, acute pulmonary edema, and postpartum hemorrhage (4). Brain damage from hemorrhage or ischemia may result in permanent neurologic sequelae and is the most common cause of death in eclamptic women (5, 6).

Eclampsia is also associated with high rates of preterm delivery, intrauterine growth restriction and perinatal death (4). Perinatal mortality ranges from 9 to 23 percent and is closely related to GA (7, 8). Premature delivery, abruption placenta, and intrauterine asphyxia are the primary causes of perinatal death in eclamptic pregnancies.

In a retrospective study done in Sudan, Gadarif Hospital from March 2007 to April 2009, the prevalence of Eclampsia was 5/1,000 (45 / 8,894 deliveries). About 62% of first convulsions occurred antepartum, 15.5% occurred intrapartum, and the rest (11.1%) occurred postpartum (9). In Ethiopia, the literature on this subject is scarce. A study done by Jackson at Princes Tsehai Memorial Hospital (1966-1969); the prevalence of eclampsia was 3.3 per 1,000 deliveries (35 / 10,704 deliveries). Two studies done by Mekbib T. in Yekatit 12 hospital and Misganaw A. & Zufan L in two teaching hospitals in Addis Ababa (Oct 1994-sept 1999) reported incidences of 3.1/1000 and 7.1/1000 (257/35,741) deliveries respectively (10,11,12).

Maternal mortality rates of 0 to 14 percent have been reported in eclamptic women (5,6, 13). Maternal mortality and severe morbidity rates are lowest in developed western society. In evaluation of 245 cases, at the Parkland Memorial Hospital, there was only one maternal death (0.4%) (13). In a 5 – year review of maternal mortality associated with eclampsia in a tertiary institution northern Nigeria, case fatality rate was 22.3% (52 deaths / 225 eclamptic cases) (14). In a pregnancy outcome evaluation of 791 eclamptic cases in Vijayanagar Indian hospital 43(5.4%) mothers died (15). In the study done in Sudan, the maternal case fatality rate was 22.2% (10/45 cases) (9).

In Ethiopia, Jackson 34 years back reported a maternal case fatality rate from Eclampsia of 17.1% (6 / 35 cases) (10). The 5 years retrospective review of Misganaw A. and Zufan L. reported case fatality rate of 13%. Eighty – four women (38.9%) had antenatal care, 157 (72.7%) were nuliparas and 69 (31.8%) were aged below 20years. Convulsions occurred ante-partum in 133(61.6%), intrapartum in 49 (22.7%) and postpartum in 34 (15.7%) mothers. Ninety nine (45.8%) women in this study were delivered by cesarean section (12).

Perinatal out come in eclampsia is closely related to GA. In a 12 years review of 254 cases of eclampsia in Tennessee University, the total perinatal mortality was 11.8%. The majority of deaths were related to either abruption of placenta or extreme prematurity. The cesarean delivery rate in this study was 49% (124/263), commonest indication being fetal distress (13).

In Ethiopian 5 year retrospective review of 216 cases managed in two teaching hospitals, of total 221 fetuses delivered, 197 single and 12 sets as twin, there were 44 still births and 25 early neonatal deaths, making gross perinatal mortality rate 312.2/1000 and the corrected perinatal mortality rate of 244.4/1000 deliveries (15 fetuses with weight <1000gms excluded) (12).

The general objective of this study is to describe perinatal and maternal outcome of eclampsia in Tikur Anbessa Hospital and explore avoidable factors contributing to the adverse outcome.

Risk of eclampsia appears to be reduced by close maternal monitoring and timely intervention. The purpose of this study is to assess the magnitude of the problem, possible risk factors and causes of maternal and perinatal deaths in the index pregnancy. The results of this study may benefit women at risk of developing eclampsia and involved health professionals.

Methods

This is a hospital – based retrospective, cross sectional descriptive study of all eclamptic mothers admitted to maternity wards and surgical ICU of Tikur Anbessa hospital in the time period of Meskerem 1, 1996 - Nehase 30, 2000 E.C. Tikur Anbessa Hospital is a specialized central referral and teaching Hospital in Addis Ababa, Ethiopia.

Data were collected by trained data collectors using a structured data collection format designed for the study and prepared in English language.

The department's patient registry and log books of the hospital were used to identify target study cases (eclamptic mothers and their neonates) and retrieve their cards. Data were cleared prior to entry and data analysis was made using SPSS version 15 soft ware. Ethical clearance was obtained from the research and publication committee of the department of Obstetrics & Gynecology and IRB of Addis Ababa University.

Results

During the study period from Meskerem 1, 1996 – Nehase 30,2000E.C, there were a total of 13,606 deliveries in TAH, of which 78 were eclamptic mothers making a prevalence of 5.7/1000 deliveries. Eleven cases were excluded because of incomplete record. There were a total of 71 newborns with 8 (11.3%) of them being twins. Most of the eclamptic mothers were in the age group of 20 to 24 years (38.8%), followed by age group of 25 to 29 years (35.8%). Majority of them, 74.6% (50/67), were married. Forty eight (72.5%) of the 63 mothers were from Addis and the rest 19 (28.4%) were from outside Addis. Most of the mothers were primigravidas which accounted for 77.6% (52/67) of cases. Most of the mothers, 73.1% (49/67) had ANC follow up.

Gestational age at the time of convulsion was not known in the majority, 64% (43/67), of the cases while preterm, term and post term cases account for 22% (15/67), 10% (7/67) and 3% (2/67) respectively. Majority of convulsions (94.37%) occurred during the antepartum period while intrapartum and postpartum periods each account only 2.8 % as times for onset of convulsions.

Forty five (67.2%) of the mothers delivered by cesarean section, making it the commonest mode of delivery. The other modes of delivery include instrumental followed by spontaneous vaginal delivery, hysterotomy and craniotomy with percentage distributions of 18.8% (12/67), 10.5% (7/67), 3.9% (2/67) and 1.5% (1/67) respectively.

Fetal distress was the commonest indication for cesarean section accounting for 33.3% (15/45) indications followed by failed induction, extreme prematurity with unfavorable cervix and others accounting for 26.7% (12/45), 22.2% (10/45) and 17.8% (8/45) respectively.

Aspiration pneumonia was the commonest maternal complication (34.3%), followed by HELLP syndrome (15.8%). Eight (12.8%) of the mothers died making the case fatality of Eclampsia in this study to be 11.9% (8/67) (See Table -1 below).

Table 1:- Frequency distribution of maternal outcomes of eclamptic mothers at TAH, Meskerem 1, 1996-Nehase 30, 2000 E.C

Variables	Number	Percent
Aspiration pneumonia	23	34.3
Pulmonary edema	7	10.5
PPH	2	3.9
ARF	7	10.5
HELLP	10	15.8
Neurologic complication	7	10.5
Maternal death	8	12.8

Table 2 below, summarizes adjusted case fatality rates by socio demographic characteristics of the eclamptic mothers. The highest case fatality, 20 % (1/5), was in mothers of older than 35 years. And the lowest case fatality rate, was in the age category of 30 to 34 years in which none of the eclamptic mothers died.

Those eclamptic mothers referred from outside Addis had the highest case fatality (26.3%). Grand multiparas had the highest case fatality among parity category groups (20%), followed by primigravidas with case fatality rate of 13.5%.

Table -2: Adjusted case fatality rate by socio demographic characteristics of eclamptic mothers in TAH, Meskerem 1, 1996-Nehase 30, 2000 E.C

Variables	Cases of Eclampsia		Number of death	Case fatality (%)
	No	%		
Maternal age in years				
15-19	8	11.9	1	12.5
20-24	26	38.8	2	7.7
25-29	24	35.8	4	16.7
30-34	4	6.8	0	0
>=35	5	7.5	1	20
Total	67	100	8	-
Marital status				
Married	50	74.6	5	10
Divorced	2	3.9	0	0
Single	6	9.9	1	16.7
Widowed	2	3.9	0	0
unknown	7	10.5	2	28.6
Total	67	100	8	-
Address				
Addis	48	72.5	3	6.2
Outside Addis	19	28.4	5	26.3
Total	67	100	8	-
Parity				
0	52	77.6	7	13.5
1-4	10	15.8	0	0
≥5	5	7.5	1	20
Total	67	100	8	-
ANC				
No	17	25.4	4	23.5
Yes	49	73.1	3	6.1
Unknown	5	7.5	1	20
Total	67	100	8	-

Mothers with unknown GA had the highest GA adjusted case fatality rate (14.9%), followed by those with GA less than 34 weeks (12.8%) and term gestation respectively (14.3%). Those mothers with GA between 34 to 36 weeks and post term gestation had the least adjusted case fatality rate (0 %). Fetal heart status was found to have significant association with maternal mortality at significance level of 0.004. Both aspiration pneumonia and SBP were also found to have significant association with significance value of 0.001 each.

But there was no significant association between maternal mortality and factors such as, convulsion delivery interval, number of fits before arrival, anticonvulsant used and onset of convulsion in relation to onset of labor. GA was also found not to be associated with maternal mortality on fisher's exact test. There was also statistically significant association between maternal death with pulmonary edema and maternal neurologic complication (See Table -3).

Table 3: Comparison analysis of selected medical characteristics of eclamptic mothers by maternal death at TAH, Meskerem 1, 1996-Nehase 30, 2000 E.C

Variables	Characteristics	Maternal death		Exact significance
		No	%	
Convulsion delivery interval	<5hr	1	11.1	**0.516**
	5-10	0	0	
	11-15	0	0	
	16-20	2	22.2	
	>20hrs	4	14.3	
	Unknown	1	20	
No of fits before arrival	none	1	9.1	**0.968**
	1-4	5	17.2	
	5-10	2	11.1	
	>10	0	0	
	Unknown	0	0	
Anticonvulsant used	MgSo4	2	16.7	**0.800**
	diazepam	6	12	
	MgSo4&diazepam	0	0	
ANC follow-up	No	4	25	**0.073**
	Yes	3	6.5	
	unknown	1	20	
FHB	Positive	3	5.5	**0.004**
	negative	5	41.7	
Aspiration pneumonia	Yes	7	30.4	**0.001**
	No	1	2.1	
Time of convulsion	Antepartum	7	11.1	**0.387**
	Intrapartum	1	50	
	Postpartum	0	0	
SBP	140-150	5	62.5	**0.001**
	160-179	2	4.6	
	>180	1	6.7	
DBP	90-99	0	0	**0.460**
	100-109	3	17.6	
	>=110	5	9.4	
GA	<34	1	11.1	**0.942**
	34-36	0	0	
	Term	1	12.5	
	Post term	0	0	
	Unknown GA	6	13.3	
Neurologic complication	Yes	4	57.1	**0.002**
	No	4	6.7	
Pulmonary edema	Yes	3	5	**0.03**
	No	5	8.3	

Perinatal outcome: Most of the neonates born to the eclamptic mothers, 71.8% (51/71), were live at birth while 28.2% (20/71) were still born. Out of 32 neonates admitted to NICU, 87.5% (28/32) were discharged alive making the overall proportion of live neonates on discharge and ENNDs to be 66.2% (47/71) and 5.6% (4/71) respectively. Prematurity was the cause of death in the 3 ENND's and the forth one was stated due to MAS.

Mode of delivery and birth weight were significantly associated with perinatal mortality on Fisher's exact test with significance value of 0.004 and 0.03 respectively. There was no significant association of perinatal mortality with variables such as type of eclampsia, GA, BP level and level of urine protein (See Table -4 below).

Table 4: Incidence of perinatal death stratified by predisposing factors at TAH, Meskerem 1, 1996-Nehase 30, 2000 E.C

Variables	Characteristics	Cases	Perinatal death	Percentage	Fisher exact significance
Type of eclampsia	Antepartum	67	24	35.8	**0.399**
	Intrapartum	2	0	0	
	postpartum	2	0	0	
Gestational age	<34	9	4	44.4	**0.864**
	34-36	7	2	28.6	
	Term	8	2	25	
	Post term	2	0	0	
	Unknown GA	45	16	35.6	
SBP	140-159	9	3	33.3	**0.708**
	160-179	46	17	37	
	>=180	16	4	25	
DBP	90-99	1	0	0	**1**
	100-109	17	6	35.3	
	>110	53	18	34	
Urine protein	NIL	14	5	35.7	**0.792**
	<2+	38	14	36.8	
	>=2+	19	5	26.3	
Mode of delivery	Non instrumental	8	6	75	**0.004**
	Instrumental	12	4	33.3	
	Craniotomy	1	1	100	
	C/S	48	11	22.9	
	Hysterotomy	2	2	100	
Birth weight	<1000	3	3	100	**0.03**
	1000-1499	9	6	66.7	
	1500-1999	14	4	28.6	
	2000-2499	22	6	27.3	
	2500-2999	14	2	14.3	
	3000-3499	8	3	37.5	
	>=3500	1	0	0	

In addition, multiple logistic regressions were done for those variables significantly associated with PNM on Fisher's exact test.

And, only two of them (birth weight and sex of the neonate) were found to have significant influence on PNM rate (p value<0.05 for both) (See Table -5 below).

Table 5:- Multiple logistic regression analysis comparing predisposing factors and perinatal mortality in eclamptic mothers at TAH, Meskerem 1, 1996 - Nehase 30, 2000 E.C

Variables	Beta	P- value
Mode of delivery	-0.449	0.096
Birth weight	-0.725	0.005
ANC follow up	-0.222	0.700
Sex of neonate	-1.229	0.043
constant	3.119	0.010

Discussion

The prevalence of eclampsia in this study, 5.7/1000 deliveries, is comparable with that of most developing countries, which is 6 to100 cases per 10,000 live births and even higher in some countries (16). The prevalence is less than the one reported by Misganaw A. and Zufan L (12) which was 7.1/1000 deliveries & higher than the 3.3/1000 and 3.1/1000 deliveries prevalences reported by studies of Jackson and Mekbib T respectively (10,11).

Fifty two (77.6%) of the cases were nuliparas which is comparable to the 72.7% in Misganaw A. study. Majority were booked (69%) unlike the Misganaw A. study in which majority were (61.1%) unbooked. This may be due to the fact that Saint Paul's Referral Hospital included in Misganaw A. study which has much higher cases from countryside. Majority were married (78.1%) and so are those in Misganaw A. study (61.9%).

Maternal age adjusted case fatality rate was highest in age group of 35 or more years (20%), and this is similar to the Nigerian study (14). Those mothers referred from outside Addis had higher case fatality than those from Addis. This may be due to the late medical intervention. Grand multiparty had the highest case fatality rate (20%) in this study in contrast to Nulliparity in the Nigerian study (14).

Mothers without ANC follow up had the highest case fatality rate (23.5%), which is similar to most studies (12, 14). Over all Case fatality rate of eclampsia in this study was 12.8% which is lower than both studies done in Ethiopian before by Jackson (17.1%) & Misganaw A. (13%) and Nigerian study (22.3%) (14). But far higher than developed countries (13).

Gestational age was unknown for majority of them at time of convulsion, 43(68.2%). This is in contrary to the Nigerian study, 67.3% of which were in the GA of 25 to 30 weeks (14). This may be our late ANC initiation and most mothers tend to forget their LMP. The adjusted case fatality rate was also highest in this group with unknown GA (14.9%) in this study.

Most of the patients, 67.2% delivered by C/S in this study, in contrary to Misganaw A. study in which most (54.2%) delivered by vaginal route. This figure is also higher than the 17.3% C/S rate of Nigerian study but similar to the Turkey study (14, 17). The most common indication for C/S was fetal distress (33.3%) in our study but CPD in the Turkey study (17). This increased fetal distress rate in this study may be due to late arrival to the study facility after repeated fits and utero-placental insufficiency.

Aspiration pneumonia was the commonest complication in this study 34.3% (23/67), followed by HELLP syndrome, which occurred in 15.8% (10/67) of the cases unlike the Indian and Turkey studies in which pulmonary edema and abruptio placentae rather were the commonest complications respectively. In these studies aspiration pneumonia was the second most common complication (15,17). Most of the convulsions in this study occurred antepartum, which similar to the Indian study (18).

Still births accounted for the majority of perinatal deaths (28.2%), which goes with the Nigerian study (14). Four neonates (5.6%) were ENND & 47(66.2%) were alive on discharge, making perinatal mortality of 338/1000 deliveries and corrected PMR= 295.8/1000 which is higher than the 244.4/1000 of Misganaw A., but less than the 411/1000 of Nigerian study (12,19).

There was also significant association between mode of delivery and birth weight with perinatal death on fisher's exact test. Adjusted still birth rate was found to be significantly associated with sex of the neonate and mode of delivery with significance of 0.033 and 0.000 respectively, which is similar to the Nigerian study (14). However, only sex of the neonate and birth weight was found to have significant effect on PNM, with multiple logistic regressions.

SBP was the only factor which affected PNM on multiple logistic regressions of predisposing factors in the Indian study (18). Birth weight of <1000 grams had the highest adjusted case fatality rates which is consistent with most of the studies (20).

Conclusions

In conclusion, eclampsia is still a common complication of pregnancy in our set up with a prevalence of 5.7/1000 deliveries, which is comparable with that of most developing countries and more than 10 times higher than that in developed countries. It is also one of the important causes of maternal and perinatal mortality. The high maternal and perinatal case fatality rates in those without ANC follow up and referred from outside Addis implies importance of ANC follow-up and good referral & transfer system. Recognition of danger signs of eclampsia preeclampsia and early referral at community level is also very important.

Further study on the subject preferably prospective with larger sample size is recommended to further assess the condition and improve its generalizability to the population at large.

The study population is not representative of the general population. Hence outcomes of the study may not be generalizable to the population of the country at large.

Acknowledgments

We would like to thank Addis Ababa University OB/GYN department research and publication committee and IRB of AAU for approving and supporting this research. We also would like to pass our heart felt gratitude to card room workers of Tikur Anbessa hospital and residents in the department for their kind support in the data collection process.

Author contact: eyasumk@gmail.com

References

1. Errol R Norwitz, et al, Eclampsia, Last literature review version. Up-to-date 19.3, January 2011.
2. Baha M Saibai: Magnesium sulphate prophylaxis in preeclampsia. Am. J. obstetrics Gynecology 2004 Jun; 190(6): 1520-6
3. World health organization. World Health Statistics 2012: WHO 2012.
4. World health organization. The hypertensive disorders of pregnancy. Report of WHO study group. WHO technical report series 758 Geneva: WHO 1987, pp 63-9
5. G.S. Melah, A.A., et al Pregnancy outcome of women with eclampsia in Gombe, Nigeria. Int. J. Gyne and obstet., (2006), 92; 251-252.
6. Okantoma, KA, Moodley, J. neurological complications associated with pre-eclampsia/eclampsia syndrome. Int. J. gynecologist 2000; 71:223
7. Lopez –Lleram, Main clinical types and sub types of eclampsia. Am. J obstet. Gynecol. 1992 Jan; 166 (1pt1): 4-9
8. Douglas KA; Redman CW Eclampsia in the United Kingdom. BMJ 1994 Nov 25; 309 (6966): 1395-400
9. G.K Adam et al, maternal and perinatal outcome of eclampsia in Gadarif hospital, Sudan. Journal of obstetrics and gynecology 2009, vol 29, No 7, pages 619-620.
10. Jackson, A.P eclampsia in Addis Ababa, pattern and treatment. EMJ, 1970; 8:123
11. Mekbib TY and ketsela K., preeclampsia /eclampsia at Yekatit 12 hospital Addis Ababa EAMJ, 1991; 68:893.
12. Misganaw A, Zufan L: Eclampsia a 5 year retrospective review of 216 cases managed in two Teaching Hospitals in Addis Ababa. Ethiop. Med J. 2006, Vol 44 No 1.
13. Sibai BM. Clampsia VI. Maternal perinatal outcome in 254 consecutive cases. AM J. Obster. Gynecol. 1990 sept; 163(3); 1049-54; discussion 1054-5.
14. Abubakar Ali Kullima, a 5 year review of Maternal Mortality associated with eclampsia in a tertiary institution in northern Nigeria. Annals of African medicine 2009. Vol 8, issue 2, page 81-84.
15. Gaddi sumans, somegowda, maternal and perinatal outcome in eclampsia in a district hospital. J. obstet. Gynecol India vol: 57, No 4 July/August 2007.
16. World Health organization International collaborative study of hypertensive disorders of pregnancy. AM. J obstet. Gynecol. 1988 Jan; 158(1): 80-3.
17. C.E. Taner et al. Prevalence, management and outcome of eclampsia. International Journal of Gynecology and obstetrics 53(1996)11-15
18. BS. Dhana njay, et al, A. study of factors Affecting perinatal mortality in eclampsia (JPBS 2009; volume 22No 2:2-5
19. Innocent O. George, Israel Jeremiah: Perinatal outcome of babies delivered to eclamptic mothers. A prospective study from Nigerian Tertiary Hospital; Int, J Biomed Sci 2009; 5(4):390-394
20. H.A Sharara, S.Y Othman, A review of eclampsia in Qatar international Journal of Gynecology and obstetrics 76(20020 177-178.

ORIGINAL ARTICLE

Premenstrual Syndrome: Prevalence, Severity, and its association with Academic and Social Performance among College Students, Jimma Southwest Ethiopia

[1]Samuel Tadesse, [2]Andualem Mossie, [3]Dereje Negussie

Abstract

Background: *The frequency of premenstrual syndrome (PMS) is high among young women, and the severity of its symptoms could interfere with their daily activities. Although it has been widely studied in many western countries, little is known about the impact of PMS in low income setting. This study aims to evaluate the prevalence and severity of PMS and its influence on academic and social activities.*

Method: *A cross-sectional study was conducted among female students of Jimma Teachers Training College in January, 2011. Seven hundred and six female students were selected using a simple random sampling technique. A structured and pre-tested self-administered questionnaire was employed for data collection. The criteria proposed by American College of Obstetrics and Gynaecology (ACOG) were used to diagnose PMS. Data analysis was made using SPSS Version 15.0.*

Result: *The prevalence of PMS was 84.4% in the present study. Family income and duration of menstrual bleeding have shown significant association with PMS ($p < 0.05$). The prevalence of Premenstrual Dysphoric Disorder, which is the severe form of PMS, was 30.9%. PMS was significantly associated with academic performance and social activities of female students. About 77.9% of the students who had PMS have lost concentration on academics in the class room lessons, and 64.5% of them had difficulties to study at home. Concerning the implication of PMS on social activities of females; 81.0% of the students missed recreational activities and 79.0% restricted from daily home chores. Academic and social problems were pronounced in students who had ppremenstrual dysphoric disorder (PMDD).*

Conclusion: *The present study revealed a high prevalence rate of PMS with a negative impact on academic endeavor and daily social activities of the students. Therefore, health education and counseling services are highly recommended for female students in the higher institutions* (**Ethiopian Journal of Reproductive Health, 2014, Volume 7(1),31-41).**

Key Words: *Premenstrual syndrome, prevalence, severity, academic performance*

[1&2]Department of Biomedical Sciences (Physiology), College of Public Health and Medical Sciences, Jimma University,
[3]Department of Obstetrics and Gynecology, college of Public Health and Medical Sciences, Jimma University

Introduction

Premenstrual syndrome (PMS) also called premenstrual tension (PMT) is a collection of physical, psychological, and emotional symptoms related to a woman's menstrual cycle (1). Premenstrual disorders include a range of problems from a mild PMS to a severe premenstrual dysphoric disorder (PMDD) (2). It is used to describe physical, cognitive, affective, and behavioral symptoms that occur cyclically during the luteal phase of the menstrual cycle and these symptoms disappear within a few days after the onset of menstruation (3). Premenstrual tension is common among younger females. The term "premenstrual tension" was described for the first time by Frank in 1931 and about 150 symptoms have been included in the list of menstrual complaints (4). There are numerous symptoms that may occur but the typical ones include somatic symptoms like bloatedness, breast swelling and pain, pelvic pain, headache, skin disorders and changes in bowel habits and the psychosocial symptoms like irritability, aggressiveness, depression, anxiety, inability to concentrate, hypersomnia or insomnia, change in appetite, specific food craving, change in libido and poor coordination (5, 6).

Various biological and psychological factors have been proposed as the cause of the PMS, including abnormal serotonin function, presence of progesterone, altered endorphin modulation of gonaddotrophic hormone secretion, exercise habits, smoking, use of alcohol, altered body fluid balance (7). PMS remains an enigma because of the wide-ranging symptoms and the difficulty in making a firm diagnosis (8). Several theories have been proposed to explain the cause of PMS. However, none of these theories have been proven, and specific treatment for PMS still largely lacks a solid scientific basis. Most evidences suggest that PMS results from the alterations in or interactions between the levels of sex hormones and brain neurotransmitters (3).

Epidemiological surveys had estimated that the frequency of premenstrual symptoms was quite high. Research done by western investigators reported that the prevalence of 85% (9). The prevalence of PMS done among University students of Calabar, Nigeria was reported to be 85.5% (10), while Rasheed and Al-Sowielem in Saudi Arabia, reported a prevalence of 96.6% (11). A similar study conducted in Ethiopia, Jimma estimated the prevalence of PMS at 99.6% and the prevalence of Premenstrual Dysphoric Disorder, according to DSM-IV criteria at 27% (8).

The incidence of true PMS has often been overestimated by including all women who experience any physical or emotional symptoms prior to menstruation. It is estimated that clinically significant PMS occurs in 20% to 30% of women. About 2% to 6% of women are believed to have the more severe variant known as a Premenstrual Dysphoric Disorder (PMDD) (2, 3).

Studies revealed a high prevalence and negative impact of PMS on students. These problems severely affect students' academic performance. As reported by Tenkir et al,, 14% of students frequently absent from classes and 15% of them missed examinations and scored low grade because of premenstrual syndrome (8). This frequent interruption of the learning activities may results in deterioration of educational achievement of female students.

The rationale of the study is to fill the knowledge gap about in knowledge on the magnitude and severity of PMS by using ACOG criteria and its influence on academic and social activities among college students in Ethiopia.

Methods

A cross-sectional study was conducted in January 2011 at Jimma Teachers Training College. A sample of 706 female students was taken using a simple random sampling technique from a total of 1476 regular female students who were enrolled in the college in the 2010/11 academic year. Samples of students were selected from 10 departments. Using the group list, every other female student was selected from each department till the required sample size is achieved.

A structured and pretested self-administered questionnaire, which was translated into Afan Oromo language was used for data collection. The questionnaire has five different parts: socio-demographic, pertinent clinical reproductive variables, ACOG PMS diagnostic criteria, DSM-IV accepted diagnostic criteria for PMDD and impairment of student physical and mental activities of students with PMS. Symptoms of PMS were classified as mild, moderate or sever PMS according to the diagnostic scales. All study participants who reported that their symptoms as moderate or sever were classified to have PMS. The questionnaires were distributed to the sampled students in the classrooms and they filled it out within a short period of time (15-20 minutes). Ten trained nurses were involved in data collection with strict supervision by the principal investigators.

Data analysis was made using SPSS Version 15.0 for Windows. Chi-square test was conducted to see the association of PMS with academic performance and social activities. Multivariate logistic regression analysis was done to control confounders and to identify the independent contribution of each dependent variable on the outcome variable.

Students with no psychiatric and other medical problems plus those who were not pregnant were included in the study. Students with known psychiatric problems and pregnant students were excluded. Ethical clearance was obtained from Jimma University Ethical Board. Clients consent was taken and confidentiality was maintained.

Result

A total of 706 female students participated in the study. The response rate was 100%, this is because sufficient description about the aim and importance of the study was given at the time of data collection and students were found to be cooperative and willing to participate in the study. Age of the study samples ranges from 15 to 30 years, with mean of 19.54 ± 1.858 (SD) years and median of 19 years. Majority of the study samples were single 573 (81.3%). The prevalence of PMS estimated using ACOG criteria was84.4% (596). The most prevalent psychological symptoms recorded were angry outbursts and depression, which was 46.1% and 43.1%, respectively. Confusion was the least prevalent symptom (27.6%). Regarding the physical symptoms, headache and breast tenderness were the most prevalent symptoms seen in 50.7% and 50.5%, respectively.

A DSM-IV criterion was used to diagnose premenstrual dysphoric disorder (PMDD), which is characterized by the presence of at least five symptoms that occur in the late luteal phase of the menstrual cycle. Among 596 study participants who were diagnosed with PMS based on ACOG criteria, 184 (30.9%) had PMDD as shown in table 1. The most frequent symptoms were fatigue or loss of energy manifested in 39.0% and loss of interest in usual daily activities observed in 37.0% of the respondents. The third most frequent symptom was inability to concentrate or focus on their studies that was seen in 35% of the students.

Table 1:- Prevalence and severity of PMS among college students, JTTC, South-western Ethiopia, 2011

	Symptom	Severity of PMS			
		Not at all N (%)	Mild N (%)	Moderate N (%)	Severe N (%)
Frequency of ACOG diagnostic criteria of PMS	Angry outbursts	164 (23.2)	217 (30.7)	230 (32.6)	95 (13.5)
	Depression	212 (30.1)	189 (26.8)	206 (29.3)	97 (13.8)
	Anxiety	166 (23.5)	240 (34.0)	215 (30.5)	85 (12.0)
	Social withdrawal	247 (35.0)	190 (26.9)	197 (27.9)	72 (10.2)
	Irritability	196 (27.8)	245 (34.7)	196 (27.8)	69 (9.8)
	Confusion	270 (38.2)	241 (34.1)	130 (18.4)	65 (9.2)
	Headache	145 (20.5)	202 (28.7)	216 (30.7)	141 (20.0)
	Breast tenderness	104(14.7)	245 (34.7)	260 (36.8)	97 (13.7)
	Abdominal bloating	195 (27.6)	189 (26.8)	205 (29.0)	117 (16.6)
	Swelling of extremities	371 (52.5)	116 (16.4)	130 (18.4)	89 (12.6)
Frequency of DSM-IV criteria for PMDD	Fatigue or loss energy	201(28.5)	229(32.5)	178(25.2)	97(13.8)
	Loss of interest in daily activities and relationships	207(29.3)	237(33.6)	166(23.5)	95(13.5)
	Problem to concentrate	241(34.1)	217(30.8)	175(24.8)	72(10.2)
	Food cravings or bingeing	308(43.8)	147(20.9)	162(23.0)	87(12.4)
	Mood swings that include bouts of crying	268(38.0)	209(29.6)	154(21.8)	74(10.5)
	Severe feelings of stress, tension, or anxiety or having panic attacks	227(32.2)	264(37.4)	146(20.7)	68(9.6)
	Constant irritability that affects other people	358(50.8)	141(20.0)	141(20.0)	65(9.2)
	Feeling sad, hopeless, or suicidal	407(57.7)	119(16.9)	119(16.9)	60(8.5)
Impairment of student's physical and mental activities	Loss of concentration in class	132(22.1)	215(36.1)	183(30.7)	66(11.1)
	Unable to do homework	212(35.6)	153(25.7)	166(27.9)	65(10.9)
	Frequently missing class	232(38.9)	148(24.8)	162(27.2)	54(9.1)
	Low grade scoring	249(41.8)	134(22.5)	146(24.5)	67(11.2)
	Exam missing	295(49.5)	107(18.0)	132(22.1)	62(10.4)
	Loss of recreational activities	113(19.0)	180(30.2)	186(31.2)	117(19.6)
	Limited daily home chores	125(21.0)	232(38.9)	162(27.2)	77(12.9)
	Limited daily activities	142(23.8)	227(38.1)	158(26.5)	69(11.6)
	Going out of the home	288(48.3)	123(20.6)	124(20.8)	61(10.2)

In this study, it was observed that PMS influenced academic and social activities. With regard to the academic impact of PMS, 77.9% of the respondents failed to concentrate on their classroom lesson; 64.5% failed to carry out their homework and 61.1% were absent from class.

Concerning the implication of PMS on social activities, 81.0% of female students missed recreational activities and 79.0% were restricted from daily home chores. Impairment of academic and social activities was strongly associated with premenstrual dysphoric disorder (PMDD), which is the severe stage of PMS.

Table 2:- Association between PMS and sociodemographic pattern and pertinent clinical reproductive characteristics, JTTC, South-western Ethiopia, 2011

	Characteristics	Total N (%)	PMS Present N (%)	PMS Absent N (%)	X^2	p value
Age	15-19 Years	383(54.9)	323 (84.3)	60 (15.7)		
	20-24 Years	297(42.6)	256 (86.2)	41 (13.8)	0.502	0.778
	≥25 Years	18(2.5)	15 (83.3)	3 (16.7)		
Marital status	Single	573(81.3)	479(83.6)	94(16.4)		
	Married	109(15.5)	96(88.1)	13(11.9)	6.535	.088
	Dissolved	23(3.3)	20(94.7)	3(5.3)		
Age at menarche	<13 Years	75(10.6)	64(85.3)	11(14.7)		
	13-16 Years	456(64.6)	386(84.6)	70(15.4)	0.197	.906
	> 16 Years	175(24.8)	146(83.4)	29(16.6)		
Regularity of menstrual cycles	Regular	491(69.70	414(84.3)	77(15.7)		
	Irregular	213(30.3)	181(85.0)	32(15.7)	0.049	.824
Duration of menstrual bleeding	< 3 days	226(32.0)	179(79.2)	47(20.8)		
	3-7 days	438(62.0)	379(86.5)	59(13.5)	7.329	**.026**
	> 7 days	42(6.0)	38(90.5)	4(9.5)		
Amount of menstrual bleeding	< average	107(15.2)	87(81.3)	20(18.7)		
	Average	517(73.4)	436(84.3)	81(15.7)	2.693	.260
	> average	80(11.4)	72(90.0)	8(10.0)		
Family history of PMS	Absent	363(51.6)	306(84.3)	57(15.7)		
	Present	340(48.4)	287(84.4)	53(15.6)	0.002	.967
Usage of contraceptives	No	521(75.1)	432(82.9)	89(17.1)		
	Yes	173(24.9)	154(89.0)	19(11.0)	3.678	.055

In the present study, duration of menstrual bleeding has shown significant association ($p < 0.05$) with PMS (Table 2).

When the duration of menstrual bleeding is prolonged (above 7 days), the possibility of having PMS increased.

Table 3:- Association between PMS, Socio-demographic pattern, and reproductive characteristics with academic performance, JTTC, South-western Ethiopia, January 2011

	Characteristics	Academic Performance		X^2	p-value	B	S.E.	AOR
		Have Impact N (%)	No Impact N (%)					
PMS	Present	318(53.4)	278(46.6)	55.29	**.000**	1.959	.319	**7.093**
	Absent	16(14.7)	93(85.3)			0	-	1.00
Age	15-19	190(49.7)	192(50.3)	1.978	.372	.490	.604	**1.632**
	20-24	134(45.1)	163(54.9)			.278	.606	1.320
	≥25	7(38.9)	11(61.1)			0	-	1.00
Family Income/ mon.	Poorest	83(53.5)	72(46.5)	5.790	.216	.243	.289	1.274
	Poor	43(43.9)	55(56.1)			-.025	.316	.975
	Medium	73(49.3)	75(50.7)			.136	.292	1.146
	Rich	63(42.3)	86(57.7)			-.196	.291	.822
	Richest	40(41.7)	56(58.3)			0	-	1.00
Place of Upbringing	Urban	162(45.1)	197(54.9)	1.773	.183	-.264	.180	.768
	Rural	172(50.1)	171(49.9)			0	-	1.00
Age at menarche	< 13	33(44.6)	41(55.4)	0.330	.848	-.188	.312	.829
	13-16	216(47.4)	240(52.6)			.081	.213	1.085
	>16 Years	85(48.6)	90(51.4)			0	-	1.00
Regularity of menstruation	Regular	239(48.7)	252(51.3)	1.231	.267	0	-	1.00
	Irregular	94(44.1)	119(55.9)			-.224	.209	.800
Duration of menstrual bleeding	< 3 days	98(43.4)	128(56.6)	3.576	.167	.159	.429	1.172
	3-7 days	219(50.1)	218(49.9)			.339	.412	1.404
	>7 days	17(40.5)	25(59.5)			0	-	1.00
Amount of menstrual bleeding	< Average	57(53.3)	50(46.7)	1.774	.412	.251	.363	1.286
	Average	239(46.2)	278(53.8)			-.164	.314	.849
	>Average	37(46.8)	42(53.2)			0	-	1.00
Family history of PMS	Absent	180(49.7)	182(50.3)	1.771	.183	.287	.173	1.332
	Present	152(44.7)	188(55.3)			0	-	1.00
Usage of Contraceptives	No	249(47.9)	271(52.1)	0.815	.367	-.214	.203	.808
	Yes	76(43.9)	97(56.1)			0	-	1.00

As shown in table 3, it was observed that academic performance is affected significantly among those students who had PMS (53.4%) as compared to those students without PMS (14.7%).

The limitation of academic performance is very high among students with PMDD (88.0%) ($p < 0.05$). PMS affected the academic performance of students by sevenfold compared to the performance of those without PMS.

Table 4:- Association between PMS, Socio-demographic variables and reproductive characteristics with performance on social activities, JTTC, South-western Ethiopia, January 2011

Characteristics		Performance on Social Act. Have Impact N (%)	No Impact N (%)	x^2	p -value	B	S.E.	AOR
PMS	Present	396(66.4)	200(33.6)	73.721	**.000**	1.912	.274	**6.764**
	Absent	25(22.7)	85(77.3)			0	-	1.00
Age	15-19	233(60.8)	150(39.2)	0.984	.612	.179	.597	1.197
	20-24	175(58.9)	122(41.1)			-.038	.598	.963
	≥25	9(50.0)	9(50.0)			0	-	1.00
Family Income/ month	Poorest	98(63.2)	57(36.8)	3.350	.500	-.085	.299	.919
	Poor	58(59.2)	40(40.8)			-.110	.323	.896
	Medium	88(59.5)	60(40.5)			-.144	.300	.866
	Rich	79(53.0)	70(47.0)			-.508	.297	.602
	Richest	57(59.4)	39(40.6)			0	-	1.00
Place of Upbringing	Urban	206(57.4)	153(42.6)	1.916	.191	.239	.185	.787
	Rural	215(62.5)	129(37.5)			0	-	1.00
Age at menarche	< 13 Years	42(56.0)	33(44.0)	3.186	.203	.012	.313	1.012
	13-16 Years	283(62.1)	173(37.9)			.478	.216	**1.613**
	>16 Years	96(54.9)	79(45.1)			0	-	1.00
Regularity of menstruation	Regular	291(59.3)	200(40.7)	0.104	.747	0	-	1.00
	Irregular	129(60.6)	84(39.4)			-.116	.212	.890
Duration of menstrual bleeding	< 3 days	118(52.2)	108(47.8)	8.920	**.012**	-.877	.463	.416
	3-7 days	273(62.3)	165(37.7)			-.676	.447	.509
	>7 days	30(71.4)	12(28.6)			0	-	1.00
Amount of menstrual bleeding	< Average	73(68.2)	34(31.8)	5.661	.059	.461	.384	**1.586**
	Average	295(57.1)	222(42.9)			-.108	.326	.898
	>Average	52(65.0)	28(35.0)			0	-	1.00
Family history of PMS	Absent	214(59.0)	149(41.0)	0.131	.717	.136	.177	1.145
	Present	205(60.3)	135(39.7)			0	-	1.00
Usage of Oral Contraceptives	No	311(59.7)	210(40.3)	0.029	.865	-.123	.208	.885
	Yes	102(59.0)	71(41.0)			0	-	1.00

The social activities of students who had PMS was affected significantly (AOR = 6.76) p<0.001, as compared to respondents without PMS (Table 4). As the duration of menstrual bleeding is prolonged, the impact of PMS on social activities increased ($p < 0.05$).

Discussion

In the study, the prevalence of PMS was 84.4%, which is in agreement with research findings reported by Steiner, Born, (9). A lower prevalence of PMS (35%) was reported by Serfaty et al (11) and 19-30% was reported by Dean et al (12). Higher prevalence of PMS (99.6%) was reported by Tenkir et al in Ethiopia (8). The possible reason for the discrepancies of the results could be due to the differences in the study design and the sample sizes taken. These related studies mentioned above were prospective-longitudinal community survey on large sample size that took 48 months. In addition, different diagnostic criteria were used.

Many factors were considered in this study as predictors of PMS using the regression analysis. These included the age s, place of residence, age at menarche, family income, amount and duration of menstrual bleeding, usage of contraceptives, and family history of PMS. The study has shown that there is significant association between duration of menstrual bleeding and PMS. In a similar study, PMS has shown significant association with age, place of residence, age at menarche, amount of menstrual bleeding and family history of PMS. Freeman, et al (13), and Gehlert and Hartlage, reported that PMS increased with age (14). Clecknedr et al (15) found that symptoms were more intense among students of age 16-18 years compared to those in the age group 13-15 years.

Bakhshni et al (16) found that students in the age group 18-20 had the highest prevalence of PMS. Tschudin et al (17) reported PMS/PMDD to be more prevalent in women of advanced reproductive age. Shershah et al (18) reported that the prevalence of PMS in Karachi was 33% and the highest prevalence of PMS was found in lower socioeconomic group living in socially deprived areas.

Premenstrual Dysphoric Disorder (PMDD) is a sever form of PMS. Among 596 participants, 184 (30.9%) fulfilled the diagnostic criteria for PMDD, according to DSM-IV. This is almost in agreement with the PMDD of 27% as reported by Tenkir and co-investigator(8). The prevalence of PMDD reported in this study was higher compared to 2-10% according to the studies reported by Rapkin et al (19) and Dickerson et al(20), but is lower than the one that was reported in the study done among university students in Nigeria, which was 36% (10).

When PMDD symptoms were ranked in order of magnitude, fatigue or loss of normal energy (39%) was ranked first followed by loss of interest in usual daily activities and relationships (37%). A related study reported that depressed mood; hopelessness or self depreciation with the magnitude of 90.5% ranked first (21), whereas, ranked last in the present study with the proportion of 25.4%, followed by irritability/anger with 81.5%, which ranked seventh in this study for its prevalence of 29.2% The possible justification for such differences could be on different definitions used, methods of data collection, sampling techniques and the study population.

Various studies have shown appearance of significant behavioral symptoms such as depression, aggressiveness, agitated depression and other symptoms like irritability, angry out-breast, headache, social withdrawal fatigue or loss of normal energy, feeling sad, hopelessness, or suicidal intention at severe stages of PMS . The nature of behavioral changes during PMS is the focus of the link between limitation of academic performance plus social activities and PMS, especially among college students.

It was found out that majority of the respondents with PMS reported greater impairment in their educational and social performance. Accordingly, 77.9% of them have lost their concentrations in classroom, 64.5% of the respondents were failed to do homework, and 61female.1% of the student missed classroom lessons because of PMS. On the other hand, 81% of the female students missed recreational activities, 79% of them have failed to accomplish daily household activities and 76.2% of the female students had difficulties to performance social activities. As supportive evidence of the present finding, several studies have reported that PMS reduces both educational and social performances significantly (8, 10, 12, 22, 23, and 24).

Tenkir et al (8), Montero et al (23), and Anandha et.al (24) reported that absence from class and low academic achievement were significantly associated with sever PMS among college students. Moreover, Yang et al, (25) reported that sever menstrual distress was associated with a big burden on mental and physical health more than any other chronic disease.

Strong association was observed between PMS and academic performance of female students in the college.

More than half of the respondents (53.4%) who had PMS were found to be low score achievers on their educational performance. The problem is higher (88%) for those students diagnosed for PMDD, which is the severe stage of PMS. The impact of PMS/PMDD has also affected their performance in social activities. About two third (66.4%) of the participants with PMS reported that they had difficulties in their social activities. Duration of menstrual bleeding was also associated with problems in social performance. In this case; the longer the duration the more sever the problem in social performance.

Various factors affecting educational and social performances of the respondents were analyzed using logistic regression model. It was shown that participants who had PMS were found to be seven times more likely to have difficulties in their educational performance compared to those students without PMS.

It was found that, majority of the respondents with PMS reported greater impairment in their educational and social performance. It was also shown that there were marked behavioral changes such as depression, aggression, irritability, mood swings during PMS.

Conclusion

To conclude, the present study revealed a high prevalence of PMS and PMDD with significant impact on academic performance and social activities of female students. Therefore, based on the magnitude of the problem, it is recommended that appropriate medications and counseling services can be provided to female students in higher institutions. Because of time limit authors were not able to confirm PMS complaints through clinical diagnosis.

Acknowledgement

Authors are grateful to Jimma University for its support. Thanks should be given to respondents and all data collectors.

Author Contact: negussiedereje@yahoo.co.uk

Reference

1. Rapkin AJ. New treatment approaches for premenstrual disorders. Am J Manag Care 2005; **11:** 480-491.
2. Deuster PA, Adera T, South-Paul J. Biological, social, and behavioral factors associated with premenstrual syndrome. Arch Fam Med. 1999; 8: 122-128.
3. Braverman PK. Premenstrual Syndrome and Premenstrual Dysphoric Disorder. J Pediatr Adolesc Gynecology. 2007; **20**: 3-12.
4. Lajoie F, Desindes S. Improving Treatment for premenstrual syndrome. Canadian J CME. 2002; 81-93.
5. Cronje HS, Krintzinger IE. Menstruation: symptoms, management and attitudes in university students. Int J Gynecol Obstet.1991;35:147-150
6. Khella AK. Epidemiologic study of premenstrual symptoms. J Egypt Public Health Assoc.1992;67:109-118.
7. Yonkers KA, O'Brein PMS, Eriksson E. Premenstrual syndrome. Lancet. 2008; 9619:1200-10
8. Tenkir A, Fisseha N and Ayele B. Premenstrual syndrome: Prevalence and effect on academic and social performances of students in Jimma University, Ethiop. J Health Dev. 2002; **17**: 181-188.
9. Steiner M, and Born L. Diagnosis and treatment of premenstrual dysphoric disorder: an update. Int Clin Psychopharmacol. 2000; **15**: 5-17.
10. Antar AB, Udezi AW Ekanem EE et al. Premenstrual Syndrome: Prevalence in students of the University of Calabar, Nigeria, Afr J Biomedical Res 2004; **7**: 745-750**.**
11. Serfaty D, and Magneron AC. Premenstrual syndrome in France: Epidemiology and therapeutic effectiveness of 1000 mg of micronized purified flavonoid fraction in 1473 gynecological patients. Contracept Fertile Sex. 1997; **25(1):** 85-90 .
12. Dean BB, Borenstein JE, Knight K, Yonkers K. Evaluating the criteria used for identification of PMS. J Women's Health (Larchmt). 2006; 15(5): 546-55.
13. Freeman EW, Halberich U. Premenstrual syndrome. Psychopharmacol Bull. 1998; 34: 291-295.
14. Gehlert S, Hartlage S. A design for studying the DSM-IV research criteria of premenstrual dysphoric disorder. J Psychosom Obstet Gynaecol. 1997; 18(1): 36-44.
15. Cleckner Smith CS, Doughty AS, Grossman JA. Premenstrual symptoms: prevalence and severity in an adolescent sample. J Adolescent Health.1998; 22(5): 403-408.
16. Bakhshani N, Mousavi M, Khodabandeh G. Prevalence and severity of premenstrual symptoms among Iranian female university students. J Pak Med Assoc. 2009; 59 (4): 205–208.
17. Tschudin S, Bertea PC, Zemp E. Prevalence and predictors of premenstrual syndrome and premenstrual dysphoric disorder in a population-based sample. Arch Womens Ment Health. 2010; 13(6):485-94.
18. Shershah S, Morrison JJ, Jafarey S. Prevalence of premenstrual syndrome in Pakistani women. J Pak Med Assoc. 1991; 41:101-103.
19. Rapkin AJ, Mikacich JA, Motakef-Imani B. Reproductive mood disorders. Primar Psychiatry 2003; 10: 31-40.
20. Dickerson LM, Mazyck J, Hunter MH. Premenstrual syndrome. Am Fam Physician. 2003; 67: 1743-1752.
21. Wittchen HU, Becher E, Lieb R, Krause P. Prevalence, incidence, and stability of Premenstrual Dysphoric Disorder in the Community. Psychological Medicine. 2002; 32: 119-132.
22. Magdy HB, Mostafa AM, Mohammed SM, Noouria SM. The phenomenology of premenstrual syndrome in female medical students. Pan African Medical Journal. 2010; 3: 19-33.

23. Montero P, Bernis C, Loukid M, Hilali K, Baali A. Characteristics of menstrual cycles in Moroccan girls: prevalence of dysfunctions and associated behaviors. Ann Hum Biol. 1999; **26**: 243-249.
24. Anandha LSPM, Saraswathi I, Saravanan A, Ramamchandran C. Prevalence of Premenstrual Syndrome and Dysmenorrhoea among Female Medical Students and its Association with College Absenteeism. Int J Biol Med Res. 2011; 2(4): 1011 -1016.
25. Yang M, Wallenstein G, Hagan M, Guo A, Chang J, Kornstein S. Burden of premenstrual dysphoric disorder on health-related quality of life. J. Womens Health. 2008; **17**: 113-12.

Review of Hysterectomies done for Cervical Intraepithelial Neoplasias (CIN) in a teaching referral Hospital

[1]Ferid Abbas, [2]Malede Birara, [3]Delayehu Bekele

Abstract

Background: *Cervical cancer is the second most frequent cancer among women in Ethiopia. The country has no formal cervical cancer screening program. There is limited cytological service and no clear guideline as to how to manage cases of CIN. Outpatient local ablative therapies are usually not available and hysterectomies are sometimes used as one option of definitive management.*

Objectives: *To review hysterectomies done primarily for management of CIN diagnosed using pap-smear and or cervical punch biopsy.*

Methodology: *Eight years retrospective document (November 2004 - January 2013) on all hysterectomies performed for CIN at St Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia was reviewed. The review employed a structured questionnaire to collect important variables from the medical records.*

Results: *A total of 2,163 hysterectomies were performed in the 8 years period of which73 (3.37%) were performed for CIN. Sixty medical records were available for review (82% retrieval rate). The degree of abnormality of the pap smear were 16(26.7%) CIN I, 17(28.3 %) CIN II and 13(21.7%) CIN III. Three cases(5%) each have a pap report of LSIL and HSIL respectively. The rest eight have CIN diagnosed by punch biopsy. Pre-operative biopsy of the cervix was done in 36 (60%) of patients. Histological studies from the hysterectomy specimen was done for 50 (83.3%) of the patients and showed 9 (18%) normal, 12 (24%) CIN I, 11 (22%) CIN II, 7 (14%) CIN III, 6 (12%) invasive cancer and 5(10%) others. Fifty five (91.7%) of hysterectomies were done abdominally and 5(8.3%) vaginally. The mean hospital stay was 9.07 days. Post-operative complications include anemia 9(15%), UTI 7(11.7%) and superficial wound infection in 6 (10%).*

Conclusion: *Hysterectomy is being used in the management of CIN lesions including those assessed as low grade lesions. Large number of patients did not have a pre-operative cervical biopsy before hysterectomy, even in those Pap smear showed high grade lesions. It is high time to introduce outpatient treatment modalities of CIN rather than using hysterectomy as a primary treatment modality due to the fact that morbidity and unnecessary burden on the health care system* **(Ethiopian Journal of Reproductive Health, 2014, Volume 7(1),42-48).**

[1,2&3]St Paul's Hospital Millennium Medical College, Department of Obstetrics and Gynecology

Introduction

Cancer of the cervix is the second most common cancer among women worldwide, with about 500,000 new patients diagnosed and over 250,000 deaths every year of which roughly 85% of cases occur in low income countries. It is a major cause of morbidity and mortality among women in resource-poor settings, especially in Africa. The majority of cancers (over 80%) in sub-Saharan Africa are detected in late stages, predominantly due to lack of information about cervical cancer and prevention services (1, 2).

Cervical cancer is potentially preventable with effective screening programs. Effective cancer screening must be backed up by an appropriate and affordable treatment and management for those who test positive. Treatment options will obviously depend on available resources, but must always be evaluated carefully (2, 3).

In the industrialized countries, aggressive treatment of all grades of CIN (as defined by cytology) using cone biopsy or hysterectomy was standard practice until the 1960s. Since then, however, and most notably over the past decade, management of pre-invasive cervical conditions has shifted toward conservative outpatient procedures that are simple and safe. This has been due to several factors including; the introduction of colposcopy; increased knowledge about the natural history of cervical dysplasia; and the availability of effective, low-cost outpatient treatment technologies such as cryotherapy and the loop electrosurgical excision procedure (LEEP) that can either destroy or remove abnormal tissue (4, 5).

In contrast, clinicians in many developing countries still rely primarily on invasive inpatient methods such as cone biopsy and hysterectomy to treat CIN, resulting in the overtreatment of many women.

Although appropriate under certain circumstances, these approaches are associated with significant complications and side-effects such as hemorrhage and infection; and they tend to put women who could be treated with less invasive methods at unnecessary risk of morbidity and mortality. In addition, both conization and hysterectomy are very costly procedures that require significant infrastructure support. They are usually performed at tertiary or university hospitals in urban settings, facilities beyond the reach of many women needing treatment (5).

Available scientific evidence, however, supports the use of several outpatient procedures (e.g., cryotherapy and LEEP) as being highly effective. The continued use of inpatient methods such as cone biopsy and hysterectomy that are more costly and potentially more risky to women is in part due to a lack of equipment and supplies to perform these simpler and safer procedures. It is also due in part to the fact that cervical cancer screening in some countries is not offered at lower levels of the healthcare system where outpatient treatment could be made available (4).

While hysterectomy made vaginally or abdominally is still indicated for conditions such as CIN 3, adenocarcinoma in situ, selected cases of microinvasion and all invasive cases, it is now known to be unnecessarily radical for treating ClN (5, 6).

Ethiopia has a population of 20.90 million women ages 15 years and older who are at risk of developing cervical cancer. Current estimates indicate that every year 4,648 women are diagnosed with cervical cancer and 3,235 die from the disease. Cervical cancer ranks as the 2nd most frequent cancer among women in Ethiopia. These figures are probably significantly lower than the actual number of cases as there is no national cancer registry system in the country (8).

The country has no formal cervical cancer screening program and HPV (Human Papilloma Virus) vaccine is not available. Furthermore, data is not yet available on the HPV burden in the general population of Ethiopia. However, in Eastern Africa, the region Ethiopia belongs to, about 33.6% of women in the general population are estimated to harbor cervical HPV infection at a given time (8).

Ethiopia has a very limited cytological service; smears are only taken in a hospital or clinic setting. There is no clear guide line also as to how to manage cases of CIN and hysterectomies are frequently used as definitive management.

The existing practice involving treatment of all CIN cases using inpatient methods that many women do not have access to and are much more costly than the outpatient techniques and require more infrastructure thus making inefficient use of scarce resources be reevaluated to ensure that the most rational, appropriate, and cost-effective CIN treatment protocols are being used (5).

Therefore, the main goal of the study was to assess hysterectomies done as a primary mode of management of CIN.

Methods

The study was conducted in the Obstetrics and Gynecology department of St Paul's Hospital Millennium Medical College (SPHMMC) found in Addis Ababa, Ethiopia. SPHMMC is a tertiary referral and teaching center serving an average of 300,000 patients annually from all corners of the country.

Eight year (November 2004 – January 2013) retrospective document on all hysterectomies performed for CIN at the hospital were reviewed. The operation theater logbook was used to identify the medical record number of all cases of hysterectomies done for the primary indication of CIN.

Sixty medical records were available for review (60/73 =82% retrieval rate) and the following information were collected from the documents reviewed; age, parity, abortion, preoperative pap smear and biopsy result, type of hysterectomy done, blood transfusion, operative complications, outcome, duration of hospital stay and postoperative histologic assessment of the specimen. Data was collected using a structured questionnaire and analyzed using SPSS version 16 software.

Permission was obtained from the college officials and no names of patients or managing health professionals were included in the study.

Inclusion criteria: All women who were admitted to gynecology ward and has undergone hysterectomy for a primary indication of CIN either with pap smear and/or punch biopsy were included.

Exclusion criteria: All women who were admitted to the gynecology ward and has undergone hysterectomy for a primary indication of CIN either with pap smear and/or punch biopsy whose medical records could not be retrieved were excluded**.**

Results

A total of 2,163 hysterectomies were done during the 8 years period. Of these 73 (3.37%) were performed for CIN. Sixty medical records were available for review(60/73 =82% retrieval rate).

Age of patients ranged from 30 to 85 years with a mean of 50.4 years with a standard deviation 10.0 years and their parity ranged from zero to 16 with a mean and median parity of 4.87 and 4.50 respectively.

The degree of abnormality of the smear were 16 (26.7%) CIN I, 17 (28.3%) CIN II and 13 (21.7%) CIN III (Table 1).

Table 1- Pre-operative Pap smear diagnosis of patient who underwent hysterectomy for CIN, SPHMMC, Addis Ababa, Ethiopia, June 2013

Pre-operative pap smear diagnosis	Frequency (n)	Percent (%)
CIN I	16	26.6
CIN II	17	28.3
CIN III	13	21.7
LSIL	3	5.0
HSIL	3	5.0
Invasive cervical cancer+	1	1.7
Normal*	1	1.7
Not done*	6	10.0
Total	60	100.0

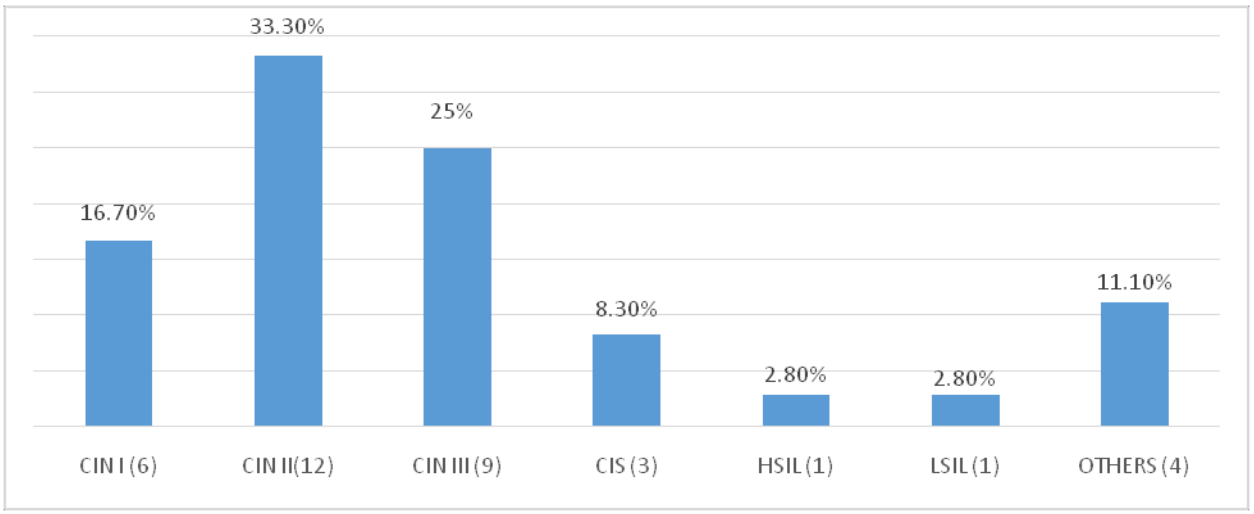
+ Pap smear report was invasive cancer while the punch biopsy result was CIN II

* A diagnosis of CIN was made on punch biopsy

Pre-operative biopsy of the cervix was done in 36 (60%) of patients while the rest 24 (40%) did not have biopsy before surgery. From the 34 patients whose Pap smear showed high grade lesions (CIN II, CIN III, HSIL or invasive cancer), only 22 (64.7%) had biopsy done prior to surgery.

Among patients for whom pre-operative biopsy of the cervix was done the majority had CIN II & CINIII (Figure 1).

Figure 1- Pre-operative biopsy results of patient who underwent hysterectomy for CIN, SPHMMC, Addis Ababa, Ethiopia, June 2013 G.C.



Fifty five (91.7%) of hysterectomies were done through abdomen while 5(8.3%) were done through vagiena. Post-operative complications include anemia 9(15%), UTI 7(11.7%), and superficial wound infection in 6(10%). Mean hospital stay was calculated from the 58 patients with discharge note and was found to be 9.07 days with a range of 3 to 52days and standard deviation of 7.3 days. Histological studies from the hysterectomy specimen was done for 50 (83.3%) of the patients and showed 9 (18%) normal, 12 (24%) CIN I, 11 (22%) CIN II, 7 (14%) CIN III, 6 (12%) invasive cancer and 5(10%) others which include cervicitis, endo-cervical polyp and metaplasia.

Among the 50 patients for whom hysterectomy specimen was subjected to pathology 6 (12%) were found to have invasive cervical cancer. Two of these patients did not have pre-operative cervical biopsy and the diagnosis was based on Pap smear result which showed CIN II in one of the patient and CIN III in the other. The other two patients had CIS on pre-operative biopsy and both had CIN III on Pap smear. The remaining two patients had CIN III on pre-operative biopsy from which one had CIN III on Pap smear and one did not have smear done at all.

There were 6 patients whose pre-operative Pap smear showed high grade lesions and 3 patients whose pre-operative biopsy showed high grade lesions but their hysterectomy specimen was not subjected to pathology. Thus a total of 9 cases with high grade lesions on pre-operative assessment did not have the pathology result of hysterectomy specimen.

Discussion

This study has attempted to assess the hysterectomies done as a primary mode of management of CIN. It has also addressed the impact of hysterectomies on operative hospital stay and patient morbidity. .

These data not only serve as a baseline for further comparisons and monitoring but also lay the ground to formulate strategies for the establishment of safe and effective treatment methods for management of precancer•ous lesions of the cervix. Form the total of 60 patients who had hysterectomy 33.3% of pre-operative Pap smears and 30.6% of pre-operative biopsies showed low grade lesions for which hysterectomy is considered to be too radical (even for high grade lesions) (9).

Where cervical cancer rates are high but CIN monitoring and follow-up are difficult or unlikely, treating all CIN cases may be an appropriate strategy-particularly since no practical and affordable method yet exists to predict with certainty which CIN lesions will progress to cancer and which will not. Proponents of this approach argue that outpatient treatment (LEEP in particular) is now simple, fast, effective, inexpensive, and safe, producing very few complications. The principal drawback is that this approach could lead to unnecessary treatment or overtreatment, resulting in some side effects or complications that could have been avoided, placing a potentially heavy burden on the health care system and providers, and raising potential costs. Clearly, the benefits of treating all lesions need to be weighed against the risks and costs of unnecessary treatment for some women (5).

From the 34 patients whose Pap smear showed high grade lesions (CIN II, CIN III, HSIL or invasive cancer), only 22 (64.7%) had biopsy done prior to surgery. In addition it was in only 36 (60%) of patients per-operative biopsy was done and the rest 24 (40%) underwent surgery based on diagnosis made by Pap smear which in fact is known to have low sensitivity especially in developing countries(10, 11).

In regions with very scarce resources, programs may opt to refer and treat only women with severe dysplasia in order to lessen the health care burden while still achieving significant health gains. Evidence suggests that CIN II can regress, although at a significantly lower rate than CIN I.

The appropriateness and cost-effectiveness of this approach, therefore, will depend partly on the proportion of CIN II cases that regress within the population being screened and treated, and partly upon the proportion of women left untreated who return for follow-up screening before invasive disease develops (5, 12).

Among the 50 patients for whom hysterectomy specimen was subjected to pathology 6 (12%) were found to have invasive cervical cancer. Most women with abnormal cervical cytology have CIN rather than invasive cancer. However, the most important diagnostic responsibility of the gynecologist is to be certain that invasive cancer is NOT present before a treatment decision is made. Therefore, the initial diagnostic step (once an abnormality is identified) is a colposcopic evaluation to determine the location and extent of the lesion on the cervix and to take directed punch biopsies of the abnormal areas that are observed. An endocervical curettage should also be done to be certain that invasive cancer is not inadvertently missed in the endocervical canal. This process constitutes the diagnostic triage (3).

Furthermore a total of 9 cases with high grade lesions on pre-operative assessment (Pap smear and biopsy) did not have the pathology result of hysterectomy specimen. This is particularly worrisome after witnessing the possibility of diagnosing invasive cancer on pathology of hysterectomy specimen. For all patients undergoing any form of therapy for CIN, cytological follow-up is important to ensure that treatment was effective and because women may be at increased risk of developing neoplasia of the vagina and vulva (3).

Conclusion

In conclusion hysterectomy was done for almost 1/3 of CIN lesions that were pre-operatively assessed as low grade lesions and significantly large number of patients did not have a pre-operative cervical biopsy before hysterectomy, even in those whose Pap smear showed high grade lesions. Some of the patients were found to have invasive cervical cancer on post-operative hysterectomy specimen and a third of these patients did not have a pre-operative biopsy and decision for surgery was made based on Pap smear result alone.

The findings of this study highlights the importance of strict adherence to standard diagnostic and therapeutic algorithms developed by WHO and other partners which can minimize the risk of overtreatment of low grade lesion and at the same time improve the preoperative diagnostic accuracy of invasive cervical cancer. It is also a high time to introduce outpatient treatment modalities of CIN rather than using hysterectomy as a primary treatment modality because of its significant morbidity and unnecessary burden on the health care system. If hysterectomy is to be done for CIN for any theoretically acceptable reason, the vaginal method is preferred over the abdominal method for its merits in terms of patient morbidity and shorter hospital stay. This study also calls for further study to identify the main reasons for the heavy reliance of physicians on inpatient treatment modalities and to assess the economic impact of inpatient treatment modalities as compared to the standard outpatient options.

Author contact – delayehu@gmail.com

References

1. World Health Organization, Sexual and reproductive health (cited 2013 MAR 16). Available from: http://www.who.int/reproductivehealth/topics/cancers/en/.
2. World Health Organization. Prevention of cervical cancer through screening using visual inspection with acetic acid (VIA) and treatment with cryotherapy. A demonstration project in six African countries: Malawi, Madagascar, Nigeria, Uganda, the United Republic of Tanzania, and Zambia. World Health Organization, Geneva, Switzerland; 2012.
3. Abwao S, Greene P, Sanghvi H, Tsu V, Winkler J, eds. Prevention and Control of Cervical Cancer in the East and Southern Africa Region. Summary of proceedings of regional meeting held in Nairobi, Kenya, 29 March to 1 April, 1998. PATH: 1998.
4. Paul D. Blumenthal and Noel McIntosh. Cervical Cancer Prevention Guidelines for Low-Resource Settings.JHPIEGO. Baltimore, Maryland, USA; 2005.
5. Bishop et al. Cervical Dysplasia Treatment: Key Issues for Developing Countries. Bulletin of PAHO 1996; 30(4):378-386.
6. Dorin Neacsu et al. Individualized treatment of pre-invasive lesions of the cervix. Annals of the Alexandru loan Cuza University Section IIa. Genetics and Molecular Biology2010; 12(3):41-7.
7. Rose I Anorlu. Cervical cancer: the sub-Saharan African perspective. Reproductive Health Matters 2008; 16 (32):41-49.
8. WHO/ICO Information Centre on HPV and Cervical Cancer (HPV Information Centre). Human Papillomavirus and Related Cancers in Ethiopia. Summary Report 2010. Available at www. who. int/ hpvcentre
9. Berek JS et al. Berek and Novak's Gynecology. Baltimore: Lippincott, Williams & Wilkins, 2007, 14th ed.
10. World Health Organization. Comprehensive cervical cancer control: a guide to essential practice. Integrating Health Care for Sexual and Reproductive Health and Chronic Diseases. World Health Organization, Geneva, Switzerland; 2006.
11. World Health Organization. Cervical cancer screening in developing countries: report of a WHO consultation. World Health Organization, Geneva, Switzerland; 2002.
12. Richart R, Wright T. Controversies in the management of low-grade cervicalintraepithelial neoplasia. Cancer 1993;71(4):1413-1421.

PROGRAM BRIEFS

ESOG - WATCH Project

Women And Their Children's Health (WATCH) project is three and half years contract awarded to Ethiopian Society of Obstetricians and Gynecologists (ESOG) through Society of Obstetricians and Gynecologists of Canadian (SOGC) to achieve DFATD's (Former CIDA) intended goal of improving maternal, neonatal and children health for underserved rural population in Ethiopia.

The main objective of WATCH project is to build the capacity of communities to recognize, prevent and respond basic MNCH issues at the household and community level and to improve the quality of health care services and increase accountability through strengthened rural women-friendly health care systems in order to reduce maternal, neonatal and child morbidity in 8 districts three regions. Therefore ESOG is working with the overall project goal of improving maternal, neonatal and children health by supporting of 8 districts in Amhara, SNNPR and Oromia regions regarding to Basic Emrgency Obstetric and Newborn Care (BEmONC) service. Total of 48 health centers is being supported by this project.

The project has been implemented in collaboration with Federal Ministry of Health (FMoH), Regional health bureau, Zonal health departments, Woreda health office, Plan International, Society of Obstetricians and Gynecologists of Canada (SOGC) and local implementing partners.

The major activities of WATCH project includes:

- Training of ESOG members in ALERM international program
- Orientation of health centres and regional health bureau about the project
- Conduct BEmONC sensitization workshop for health administrators
- Conduct BEmONC needs assessment at the 48 health facilities
- Produce needs assessment report and disseminate to stakeholders
- Identification of participants from each health center for BEmONC training (3 trainees from each center)
- Procurement of supplies and resources to deliver BEmONC training
- Provide BEmONC training for 144 health care providers
- Provide supportive supervision at health facilities
- Recruit CEmONC Focal Person at each region to ensure referral linkage with BEmONC heath facilities.

Over the year, ESOG has made considerable progress in the implementation of activities. The needs assessment of 48 health centers regarding BEmONC service was conducted. Based on the findings from the needs assessment, ESOG conducted BEmONC training especially focusing on the identified gaps. In addition, consultation to PLAN International/Ethiopia was made to purchase necessary supplies and equipment to health canters.

BEmONC sensitization workshop for health administrators was done to support an enabling environment for BEmONC service at the ground level. The workshop aims at exposing the appropriate resource and strategies to health administrators to facilitate the improvement of obstetric care offered in their institution. Total of 85 health administrators attended the sensitization workshop.

In order to build the capacity of health care providers, BEmONC training was given to 146 mid-level health workers selected from 48 health centers. The goal of BEmONC training is to ensure that health facilities have competent providers who can offer quality BEmONC service. Quarter based supportive supervision is being done to assure provision of quality BemONC service at the health facilities by using ESOG members. CEmONC Focal Person was recruited at each region to ensure referral linkage with BEmONC heath facilities.

During the project implementation period, some challenges were faced:

- Woreda health office unable to meet our requirement to train 3 health care providers from each health center. Sending trainees over/under their quota.
- Delay in project implementation process (initially)

This project enables ESOG and its members to reach mid-level health service providers and to understand what is going on at the grass root level of the health system. As BEmONC training is not the only answer to save life of mothers and newborns – continuous supportive supervision and supplying of equipment is being conducted together with partners to make the training more effective.

For more information: WWW.esog.org.et

UNFPA

UNFPA, the United Nations Population Fund, delivers a world where every pregnancy is wanted, every birth is safe, every young person's potential is fulfilled.

UNFPA expands the possibilities for women and young people to lead healthy sexual and reproductive lives. It accelerates progress towards universal access to sexual and reproductive health, including voluntary family planning and safe motherhood. It also advances the rights and opportunities of young people.

UNFPA is helping real progress – yet more needs to be done. Fewer women are dying in childbirth, more unwanted pregnancies are prevented, and young people's opportunities have expanded. But much more needs to be done to achieve a healthy and just world and improve the quality of human life.

UNFPA helps countries use population data to plan for tomorrow's challenges. It provides technical guidance, policy advice, training and support. And it ensures that the reproductive health and rights of women and young people remain at the very heart of development.

Two overarching frameworks guide UNFPA's efforts: the Programme of Action of the 1994 International Conference on Population and Development (ICPD) and the Millennium Development Goals (MDGs).

UNFPA's assistance to Ethiopia began in 1973 and the Fund has since implemented six five-year programme cycles. Currently UNFPA is implementing its 7th Country Programme (2012-2015) aligned to the global Strategic Plan, the United Nations Development Assistance Framework and national priorities as reflected in the Growth and Transformation Plan (GTP).

For more information: http://ethiopia.unfpa.org

INSTRUCTIONS TO AUTHORS

1. Type of Articles

The Ethiopian Journal of Reproductive Health (EJRH) publishes original articles, review articles, short reports, program briefs, and commentaries on reproductive health issues in Ethiopia, and the African region. The ERHJ aims at creating a forum for the reproductive health community to disseminate best practices, and relevant information on reproductive health.

Original Articles: Articles reporting on original research using quantitative and/or qualitative studies could be submitted to EJRH.
Review Articles: Review articles on all aspects of reproductive health issues could be considered for publication in the EJRH.
Commentaries: Commentaries on any aspects of reproductive health in Ethiopia or the African region will be considered for publication in the EJRH.
Program Briefs: A one or two pages of description of a program run by governmental or non-governmental organizations could be submitted for publication. These briefs should give short summaries about the objectives, strategies for implementation, and expected outputs of programs that are executed by different organizations.
Short Reports: Preliminary research findings or interesting case studies could be presented in a summarized form to the journal.

2. Uniform Requirements

In order to fulfill uniform requirements for the journal, the following instructions have to be followed by authors:

Manuscript layout: Manuscripts should be written in English and typed double-spaced leaving generous margins. Pages should be consecutively numbered. The body of the manuscript should be organized under appropriate headings and sub-headings such as introduction, methods, results, discussion, acknowledgements, and references.
Title page: The title page should have title of the article; name of each author and institutional affiliation, and address of the corresponding author.
Abstracts: Articles should have abstracts of not more than 250 words. It should summarize the background, objective, methods, major findings and conclusions.
Tables and Figures: All tables and figures should be submitted on separate sheets of paper and be clearly labeled in the order of their citation in the text. A reader should be able to read only the tables and easily understand all information without reading the text.
References: References have to be numbered consecutively in the order in which they are first mentioned in the text. References must also follow the Vancouver system.
Number of words: An article should not exceed 5000 word count and the abstract needs to be up to 300 words.

3. Submission of Manuscripts

Manuscripts should be submitted to the Editor-in-Chief in three good quality copies accompanied by a cover letter signed by all authors. In addition, an electronic copy of the article has to be submitted via email to the journal. When articles are accepted, authors will be required to submit a filled "Author (s) Guarantee Form", which certifies that all authors have contributed to the work submitted, and that the content of the manuscript has neither been previously published nor being considered for publication elsewhere. Please note that Case Reports and faxed submission of manuscripts will not be accepted.

Authors could submit manuscripts to the journal at the following address:

Ethiopian Journal of Reproductive Health
Ethiopian Society of Obstetricians and Gynecologists (ESOG)
P.O. Box 8731, E-mail– esog@ethionet.et
Addis Ababa, Ethiopia
Tel: 251-115506069, Fax: 251-11556070