Original Article

Risk factors for mortality among eclamptics admitted to the surgical intensive care unit at Tikur Anbessa Hospital, Addis Ababa, Ethiopia.

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Abstract

***Background**: Facilities for intensive care are scarce in low-resource settings. Identifying determinants of mortality among eclamptics requiring intensive care will provide insight regarding prioritization as to which group of eclamptics would benefit from earlier referral or transfer to ICU this will improve survival in the face of scarce resources available for ICU.*

***Setting**: Tikur Anbessa Hospital, a teaching and central referral hospital in Addis Ababa, Ethiopia.*

***Objectives**: To identify risk factors associated with mortality of eclamptics who required intensive care after admission to TAH- SICU.*

***Methods**: A ten years retrospective, hospital based case-control study. The case records of eclamptics admitted to the SICU during the study period were reviewed. Cases were those mothers who died, with the survivors acting as controls. Several variables were assessed among the cases and controls to assess their risk towards mortality; OR and 95% CI computed.*

***Results**: The majority were below the age of 30 years, 124 (84.4%); nulliparous 103 (70.1%) and from Addis 113 (76.9%). Lateralizing signs were observed in 11(7.5%). Age greater than 29 years (OR 3.29; 95% CI, 1.18-9.12); being a housemaid (OR 5.93; 95% CI, 1.13-34.15); multiparity (OR 3.32, 95% CI 1.40-7.87) and the presence of lateralizing signs at admission (OR 4.57; 95% CI, 1.12-19.04) were significantly associated with the risk of mortality. The overall SICU case fatality rate was 25.9 %.*

***Conclusion**: More vigilant attention should be given to eclamptics older than 29 years, those with low-socioeconomic status, multiparous mothers and presence of lateralizing signs at admission. Prioritizing ICU admission to these groups may improve survival. There is a need to conduct more studies on ICU mortality to come up with more detailed indications for prioritizing ICU admission.*

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Introduction

Hypertensive disorders of pregnancy are common and form one of the deadly triads of maternal mortality. In a report from the USA by Berg and colleagues (1996), 18% of maternal deaths from 1987-1990 were related to pregnancy induced hypertension. Reports from developing countries indicate that PIH particularly eclampsia account for about 11% of maternal mortality being only third to hemorrhage, 24% and infectious causes 17% (1,2). Of all the diverse conditions lumped under the broad classification of PIH, eclampsia poses the greatest risk to maternal mortality.

Eclampsia is the occurrence of convulsions and/or coma unrelated to other cerebral conditions in a patient with signs and symptoms of preeclampsia. Eclampsia is primarily a disease of the young primigravida. Stroganoff in 1900 reported 5.4% mortality compared to 17-29% for European clinics and 21-49% for American clinics of the same period (3). Current incidence in the developed world is small and varies from 0.27 per thousand to 0.49 per thousand [4-8] The rate in developing countries is as high as 13 per thousand deliveries. The provision of ANC services, early diagnosis and hospitalization with administration of prophylactic magnesium sulphate for severe pre eclampsia is said to contribute to the markedly lower incidence in the developed world (9).

The few available data from Ethiopia report incidences of 3.1-3.3 per thousand deliveries in 1989 and 1969 respectively (10, 11). A 7.1 per thousand incidence was noted at two teaching hospitals in Addis Ababa in a five year period by Abate in 1999 [12]. He noted that the incidence of eclampsia was higher in those without ANC and twin gestations. Eclamptic convulsions may occur antepartum (50%), intrapartum or postpartum (25% each) (13). Severe preeclampsia and eclampsia present management challenges which may only be successfully met by facilities and expertise offered in high dependency or intensive care units (HDU/ ICU). Both are characterized by the availability of more intensive nursing and medical care and more sophisticated monitoring and

support of vital functions that is not available in general wards. Eclamptics require intensive care when there is failure of the function of an organ system/s. A dedicated obstetric HDU/ICU is highly desirable in the early detection and management of eclampsia complications. Any woman in whom the diagnosis of severe preeclampsia or eclampsia is made is ideally managed in a HDU. The common indications for transfer to an ICU are refractory eclampsia, respiratory failure, cardiovascular instability, central monitoring and renal insufficiency (14). The primary goal of treatment of women with eclampsia is to control the BP, control convulsions and termination of pregnancy (15). When eclampsia is complicated with end organ damage, additional management in reference to organ support until the acute episode subsides is required.

There is a severe shortage of facilities for intensive care in low-resource countries like Ethiopia. This creates difficulties in timely transfer of eclamptics for intensive care and at times death prior to transfer. The aim of this study is to identify possible risk factors associated with mortality from complications of eclampsia. This will give insight as to which groups of patients would benefit from early referral, transfer or admission for management in the SICU in order to improve survival in the face of the scarce resources and manpower in our setting. TAH-SICU is the only facility in Addis Ababa where eclamptic patients referred from the city requiring intensive care are admitted and managed. It is reasonable to consider that data obtained from patients admitted to this unit may give insight as to the main clinical data of the eclamptic episode, the obstetric profile, therapeutic measures taken and the risk factors associated and frequency of complications among those that survived and those who died in the Ethiopian setting. The objective of the study is to evaluate risk factors associated with mortality in eclamptic patients who required intensive care after admission to Tikur Anbessa Hospital SICU during the study period.

Subjects and Methods

A ten year hospital based retrospective case-control study on eclamptics admitted to the surgical intensive care unit of Tikur Anbessa Hospital- a central referral hospital -covering the period from October 1995 to September 2004 was conducted. All eclamptics admitted and managed at the unit during the study period were included in the study. Those who died at the SICU were taken as cases, while those who were discharged or transferred improved were the controls.

Tikur Anbessa Hospital is a central referral hospital in Addis Ababa, Ethiopia equipped with a SICU staffed by anesthesiologists, anesthesia residents and trained nurses. The ICU has six beds and as the only ICU in the city at the time of the study, all eclamptics who required intensive care during the studied period were admitted to the unit. Due to the shortage of ICU beds only patients who fulfill certain criteria are granted admission to the ICU. These include unstable vital signs, airway obstruction, respiratory failure and immediate postoperative cases.

Admitted cases of eclampsia were identified from the SICU admission and discharge registration book, their case records retrieved from the hospital archives and information on sociodemographic and clinical parameters were collected using a structured data collection format. The EPI-Info Version 6 statistical software was used to analyze the data. The chi-square test was used to compare proportions and a p-value of 0.05 was taken as the significance level. Odd's ratios with 95% CI were computed for comparison variables. Multivariate analysis of age and parity was done using the SPSS statistical software.

Results

During the ten years studied, 176 eclamptics were admitted to the SICU of the hospital. From the archives, 147 (83.5%) charts were retrieved. Admission rates for eclampsia progressively increased from 3(2%) in 1995 to 22(15%) in 2004 of total SICU admissions. Majorities were in the age groups of 20-29, 83 (56.5%), (Table 1, 2). Patients age ranged from 15-39 years

with the mean age of all eclamptics being 23.4 (SD 5.2). Survivors had a significantly less age 22.6 (SD 4.9) compared to those who died 25.6(SD 5.6) (P<0.01). Age greater than 29 was significantly associated with risk of dying (OR 3.29; 95% CI 1.18-9.12). Six (15.8%) were housemaids among those who died compared with 3(2.8%) of the survivors. Being a housemaid (OR 6.63, 95%CI 1.36-35.15) and multiparity (OR 5.93, 95% CI 1.13-34.00) were significantly associated with a higher risk of death. Multivariate analysis showed that both age greater than 30 years (OR 4.15, 95% CI 1.11-15.5) and multiparity (OR 2.55, 95% CI 1.05-6.02) were independent risk factors for dying.

Table 1- Sociodemographic characteristics of eclamptic admissions to the SICU, Tikur Anbessa Hospital, Addis Ababa, Ethiopia, 1995-2004.

Variable	Deaths		Survivors		Total	
	Number	%	Number	%	Number	%
Age(Years)						
15 – 19	5	13.1	36	33.0	41	27.9
20 – 24	9	23.7	31	28.4	40	27.2
25 – 29	13	34.2	30	27.5	43	29.3
30 – 34	9	23.7	9	8.3	18	12.2
35 - 39	2	5.3	3	2.8	5	3.4
Total	**38**	**100.0**	**109**	**100.0**	**147**	**100.0**
Address						
Addis Ababa	29	76.3	84	77.1	113	76.9
Out of Addis Ababa	9	23.1	25	22.9	34	23.1
Total	**38**	**100.0**	**109**	**100.0**	**147**	**100.0**
Occupation						
House Wife	17	44.7	70	64.2	87	59.2
Student/lives with family	3	7.9	7	2.8	10	6.8
Daily laborer	1	2.6	4	3.7	5	3.4
Government employed	3	7.9	2	1.8	5	3.4
House maid	5	13.2	3	2.8	8	5.4
Private employed	1	2.6	3	2.8	4	2.7
Unemployed (lives with boyfriend)	0	0	3	2.8	3	2.0
Unknown	8	21.1	17	15.6	25	17.0
Total	**38**	**100.0**	**109**	**100.0**	**147**	**100.0**
Marital Status						
Married	23	60.5	79	72.5	102	69.4
Single	10	26.3	18	16.5	28	19.0
Unknown	5	13.2	12	11.0	17	11.6
Total	**38**	**100.0**	**109**	**100.0**	**147**	**100.0**

Table 2- Possible risk factors associated with maternal mortality among eclamptics admitted to the SICU of Tikur Anbessa Hospital, Addis Ababa, Ethiopia, 1995-2004.

Possible risk factor:	Cases		Controls		Significance		Odds Ratio	95% CI
	Number	%	Number	%	X^2	p-value		
Age ≥ 30 years	11/38	28.9	12/109	11.0	6.9	<0.05	3.29	1.19 to 9.12
Being House maid	5/30	16.7	3/92	3.3	6.64	<0.05	5.93	1.13 to 34.15
Multiparity	18/37	48.6	24/108	22.2	9.4	<0.05	3.32	1.40 to 7.87
Lateralization at admission	6/32	18.8	5/104	4.8	6.40	<0.05	4.57	1.12 to 19.04
Secondary Diagnosis for admission to SICI								
Respiratory Complications	23/38	60.5	41/109	37.6	6.02	<0.05	2.54	1.12 to 5.82
Neurologic	23/38	60.5	30/109	27.5	13.31	<0.05	4.04	1.74 to 9.45
Neurologic Diagnosis at admission to SICU	11/38	28.9	9/109	8.3	10.3	<0.05	4.53	1.54 to 13.44
Oliguria in SICU	15/32	46.9	12/99	12.1	17.9	< 0.05	6.40	2.33 to 17.86

Table 3 indicates the main obstetric profile and other clinical parameters of patients. Twin delivery rate was 18(12.2%) of the total. 45(30.6%) of the patients had no antenatal care. No significant association was detected between antenatal attendance and twin delivery with a higher risk of death. Premonitory symptoms were documented in 95(64.6%) of the total with 34(35.8%) having at least one; 41(43.1%) had two or three symptoms while 20(21.1%) had none. Onset of convulsions were antepartum in 102(69.4%), intrapartum in 23(15.6%) and postpartum in 22(15.0%).

The maximum mean systolic and diastolic blood pressures of the total cases were 175.4 mmHg and 118.8mmHg respectively. The maximum mean systolic blood pressures among those who died and survived were 181.7mmHg and 173.0 mmHg respectively. The maximum mean diastolic blood pressures among those who died and survived were 119.7 and 118.4 mmHg, respectively. There was no statistically significant difference in the maximum mean systolic and diastolic blood pressures of the cases and controls. Lateralizing signs were present in 11(7.5%) of the patients at hospital

admission; 6(18.8%) of those who died compared to 5(4.8%) of survivors. Presence of lateralizing signs was significantly associated with a risk of dying (OR 4.57; 95% CI 1.12-19.04).

Immediate reasons for transfer to SICU included respiratory complications 64 (43.5%); neurologic complications 53 (36.1%); uncontrolled convulsions 32 (21.8%); acute renal failure 23 (15.6%); providers conviction for need to critical care 26 (17.7%) and uncontrolled hypertension in 18(12.2%). Respiratory complications included aspiration, hospital acquired pneumonia, respiratory failure, pulmonary oedema and adult respiratory distress syndrome. Neurologic complications encountered were prolonged coma, blindness, brain death and possible intracranial hemorrhage. The presence of neurological complications (OR 4.04; 95% CI 1.74-9.45) and respiratory complications (OR 2.54; 95% CI 1.12-5.82) were significantly associated with risk of dying compared to other admission diagnosis. Twenty six (19.8%) of total patients had oliguria; 15 (46.9%) of them died compared to 11(12.1%) who survivors. Presence of oliguria was significantly associated with mortality risk (OR 6.4; 95% CI 2.33-17.86).

Main interventions undertaken at the SICU included mechanical ventilation for 90(61.2%); central venous pressure monitoring for 36(24.5%) and dialysis for 2. One hundred and nine (74.1%) of the total patients admitted were transferred to the wards improved while 38(25.9%) died at the SICU (case-fatality rate). Thirteen (34.2%) of the deaths were admitted in a moribund state with evidences of brain death making the corrected case fatality rate in SICU 25 (18.7%). The mean duration of stay in the SICU was four days and nineteen hours. The commonest causes of death were multiple organ failure 24(63.2%), neurologic complications in 18(47.4%) and respiratory failure in 12(31.6%). Other causes included shock in 9(23.7%), acute renal failure 8 (21.1%), cardiopulmonary arrest 8(21.1%) and anesthesia complications in 4(10.5%).

Table 3- Main obstetric profile and clinical data of eclamptics admitted to the SICU at Tikur Anbessa Hospital, Addis Ababa, Ethiopia, 1995-2004.

Variable	Deaths		Survivors		Total	
	Number	%	Number	%	Number	%
Parity						
Pimigravida	19	50.0	84	77.1	103	70.1
1 – 5	16	42.1	23	21.1	39	26.5
≥ 6	2	5.3	1	0.9	3	2.0
Unknown	1	2.6	1	0.9	2	1.4
Total	38	100.0	109	100.0	147	100.0
ANC Booking						
Booked	25	65.8	64	58.7	89	60.5
Not booked	6	15.8	399	35.8	45	30.6
Unknown	7	18.4	6	5.5	13	8.8
Total	**38**	**100.0**	**109**	**100.0**	**147**	**100.0**
Gestational age						
Term	13	34.2	50	45.9	63	42.9
Preterm (34 – 36 weeks)	11	28.9	29	26.6	40	27.2
Remote from term (28 – 33)	5	13.2	13	11.9	18	12.2
Abortion (< 28 weeks)	7	18.4	6	5.5	13	8.8
Post term	1	2.6	2	1.8	3	2.0
Unknown	1	2.6	9	8.3	10	6.8
Total	**38**	**100.0**	**109**	**100.0**	**147**	**100.0**
Pregnancy						
Single	31	81.6	95	87.2	126	85.7
Twin	4	10.5	14	12.8	18	12.2
Unknown/Undelivered	3	7.9	0	0	3	2.0
Total	**38**	**100.0**	**109**	**100.0**	**147**	**100.0**
Number of convulsions before admission to SICU						
1 – 5	17	44.7	43	39.5	60	40.8
6 - 10	7	18.4	19	17.4	26	17.7
Repeated (≥ 11)	10	26.3	37	33.9	47	32
Unknown	4	10.5	10	9.1	14	9.5
Total	**34**	**100.0**	**99**	**100.0**	**133**	**100.0**

Discussion

Utilization of SICU services for eclamptics progressively increased over the years indicating increased awareness of health professionals of the comparative advantages in outcome. The higher risk of death noted in women older than 30 years of age and the multipara, is possibly due to delayed health seeking behavior due to possibly uneventful previous birth experiences or decrement in physiologic reserves as age advances. Older age and multiparity were independently associated with the risk of dying agreeing with other authors that while primigravidity may be the most important risk for the development of preeclampsia, multiparity is the risk associated with higher maternal mortality. Low socio economic groups such as housemaids had higher mortality most likely due to being uneducated, underprivileged, likely to have unwanted pregnancy and being late to seek medical attention. A significant number 30.6% had no antenatal care contributing to late presentation and a high case fatality rate. Presence of lateralizing signs and neurologic involvement such as deep prolonged coma was associated with poor outcome indicating that the prognosis of patients with cerebral involvement is poor. Lack of computerized tomography or magnetic resonance imaging studies to identify the specific cause of coma and neurologic complications and institute appropriate therapy may be responsible for the poor outcome. This deficiency is noted to be a serious limitation to critical care of eclamptics at the hospital.

Several limitations in quality of critical care provision were noted. Important laboratory investigations were not recorded and possibly not determined including urinary protein in 18.4%, hematocrit in 4.7%, blood group in 14.3%, platelet count in 46.9% and renal/liver function tests in 34%. This may be due failure to consider performing these tests, poor recording but most likely are because of failure of the patient to afford the costs or inadequate supply of reagents by the hospital. Only 24.5% of the patients had CVP monitoring and only two out of eight women who required dialysis actually obtained the service indicating

that a significant proportion of the women may not have received the necessary critical care they required due to lack of facilities and manpower. This fact *per se* may have contributed to mortality risk.

The unavailability of magnesium sulphate for convulsion control may also contribute to poor outcome due to its documented superiority over diazepam in the management of eclampsia. This is one aspect of the management requiring urgent attention. Both the gross and corrected case fatality rates are markedly high. Being the only referral hospital for SICU care, this may not be surprising since critical and complicated patients are referred from other hospitals. Scarce resources and manpower, delay in are referral and suboptimal SICU care are potentially responsible for this very high figure.

Early referral for SICU care of older women, the multipara, those with pulmonary and neurologic complications and those of low socioeconomic group may improve survival. The study has also shown that the quality of SICU care is often lacking in essential facilities which need to be addressed. Establishment of a dedicated obstetric high dependency unit (HDU) or ICU is highly desirable for early detection and management of complications of eclampsia. Although all mothers with eclampsia deserve ICU care, provision of such services will be impossible in the near future in low-resource settings in Africa. Till that is possible, using selective criteria such as mothers with the above mentioned risk factors for admission to SICU may be one approach for effectively utilizing the limited resources. As this study is retrospective and of small sample size, conducting a larger study to better clarify risk factors for mortality following eclampsia requiring ICU care is recommended. Such a study will help in outlining indicators useful in identifying eclamptics who would benefit from early referral for intensive care.

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Review Article

The Health Extension Program: A flagship for bringing health services to the doors of communities

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Abstract

Recognizing the need for strengthening the health care delivery system in the country, and to bring services to the doors of communities, the Government of Ethiopia has launched the Health Extension Program (HEP). HEP is a new initiative developed as one of the components of the Health Sector Development Program (HSDP-II), which is an innovative community based health care delivery system. In order to address the acute shortage of human resources in the areas of health, and the prevailing constraints in the training of health professionals, HEP has also become a centerpiece for the "Accelerated expansion of primary health care coverage" program. Under HEP, in the coming two years, over 30,000 health extension workers (HEWs) will be trained and deployed for some 15,000 health posts, which includes the construction and/or upgrading of 3153 health centers. The main objective of HEP is to improve access and equity to preventive essential health interventions provided at village and household levels with focus on sustained preventive health actions and increased health awareness. It also serves as effective mechanism for shifting health care resources from being dominantly urban to the rural areas where the majority of the country's population resides. The Government has now trained and deployed close to 17,500 HEWs, and they were assigned to about 9000 health posts (villages), and this comprises over 60% of the planned 33,200 HEWs to have blanket coverage. HEP is considered as the most important institutional framework for achieving the Millennium Development Goals.
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Introduction

The health status of the people of Ethiopia is very low compared to other developing countries, which is compounded by high population growth, which is 2.7 million per annum (1). As the available health service was very limited and was organized mainly in urban areas, the majority of the rural population was not able to access modern health care services. This situation has led to ineffective health care delivery system, which cannot respond to the health needs of the population at large. Furthermore, the health service delivery system of the country operated for years in isolation without the involvement of other sectors such as education, agriculture, water, etc. which are relevant for development of health of the nation. This state of affairs had failed to meet the demands of most in need, as they were geographically or socially remote to benefit from such facilities.

In Ethiopia, it is estimated that 61 percent of households have access to an improved source of drinking water with access in urban areas much higher than in rural areas (94 percent and 56 percent, respectively). In urban areas, 90 percent of households have access to piped water compared to only 13 percent of rural households. On the other hand, the major source of improved drinking water in the rural areas, which is 39 percent, is protected spring (2). An estimated 75 percent of health problems of the country are due to infectious and communicable diseases, which could be easily prevented or controlled by applying simple sanitary measures. However, they still contribute to the high morbidity and mortality, especially among infants and children. Infant and under five mortality rates were recorded at 77 and 123 per 1000 live births, respectively (1), whereas, the maternal mortality ratio stood at 673 per 100,000 live births, which are still the highest among Sub-Saharan African countries (2).

In a similar manner, contributions from communities and their direct participation in health activities have been hampered for years. As a result, communities were not given opportunities to play an active role in deciding the type of activities they want, and get involved in the kind of actual

service they receive. In similar setting where communities take active participation to produce their health, results showed significant improvement in the health of the population.

Such a situation prompted the Ethiopian Government to seriously and critically re-evaluate and re-examine existing policies and strategies in order to address the huge service delivery gap prevailing in the country.

The objectives of this article therefore, are to describe the principles and strategies of the Health Extension Program (HEP), to make readily available information to key stakeholders and the reproductive health community on HEP, and finally to help promote HEP to attain its set targets in the long way for achieving the MDGs.

The Health Extension Program

In Ethiopia, there exists very high unmet need for health care in rural areas of the country where close to 85 percent of the population lives. The health sector delivery system of the country has been historically unable to respond to the health needs of the people. It was highly centralized, and relied on a fragmented vertical programs delivery system with little collaboration between the public and private sectors. In spite of the past efforts made and gains registered by the health sector, it is realized that essential health services have not reached the population at the grass root levels as stipulated in the health sector policy. This was confirmed by the evaluation results of Health Sector Development Program (HSDP I). The Government of Ethiopia therefore decided to introduce an innovative community based approach aimed at creating healthy environment as well as healthful living by introducing a HEP as a sub-component of the HSDPII (3).

General objective of HEP

It is to increase access and ensure equity to preventive essential health intervention through community based services with strong focus on sustained preventive health actions and increased general health alertness. This would enable to bring about behavioral changes to ensure that communities perceive and manage their own health and health

related activities to create healthy environment as well as healthful living.

Specific Objectives of HEP

Some of the specific objectives of the HEP include, 1) providing basic hygiene and sanitation education continuously to the community in order to identify the basic health problems and take action; 2) increase peoples' participation mainly on communicable diseases which need special attention such as malaria, HIV/AIDS, TB, etc.; 3) provide basic information to women/ nmothers, youth and children about family health programs specially on vaccination and family planning; 4) promote integrated child health to prevent diseases that can cause mortality, morbidity and disability among children; 5) provide first aid service for accidents until the victim reaches the nearest health facility; and 6) increase awareness among younger members of the population about reproductive health, STDs, HIV/AIDS, abortions, unwanted pregnancies, harmful traditional practices.

Essential Elements of HEP

First of all such initiatives require strong and sustained political will and commitment by the government to improve preventive health and socio-economic condition of the population. This requirement is fulfilled by the prevailing policy environment and support being providing for this initiative. This indeed has helped in the development of a nationwide accessible, preventive, promotive and curative health services in the country. In a short period of time, it has been possible to avail provision of a system in which HEP is an integral part of overall development of the community.

HEP still requires support from and interaction with other sectors participating in health development. There is an obvious linkage between health and agriculture, health and education, health and water supply, etc., which are mutually supportive at all levels. There is also a place for key partners in development to strengthen government efforts in close collaboration and partnership. In order to maximize the impact of this initiative, utilization of

relevant and appropriate technologies that are acceptable, cost effective and affordable are desirable. Furthermore, the main trust of the HEP is to involve individuals, families and communities for their support and active participation, which is crucial for the effective implementation of the program.

It is therefore imperative that HEP should be shaped around the life pattern of the people it is serving, and should be able to meet their needs. Moreover, activities should be fully integrated with that of other sectors involved in community development activities. The people in the community should be the driving force in the formation and implementation of preventive health care activities so that the health care can be brought in line with the local needs and priorities relying on utilization of available community resources.

Within the HEP strategy the essential minimum health care program which should be made accessible to all has been identified as "Health Extension Packages". HEP is introduced as one of the key components of in HSDPII. The core of HEP is to identify and provide a list of essential health services to households at the kebele level, and these essential packages include the following components:

Disease Prevention and Control: HIV/AIDS and other STIs, TB, Malaria prevention and control as well as first aid emergency measures. The main objectives of this component program are to reduce morbidity, disability and mortality.

Family Health Service: Maternal and child health, Family Planning, Immunization, Adolescent reproductive health, and nutrition. The main objectives of the above component program are to strengthen and gradually expand family planning, maternal and child health care, and youth and nutrition services.

Hygiene and Environmental Sanitation: Excreta disposal, Solid and liquid waste disposal, Water supply and safety measures, Food hygiene and safety measures, Healthy home environment, Control of insects and rodents, and Personal hygiene. The main objectives of the above component program are to increase coverage of hygiene and environmental health services to the population at large.

Health Education and Communication: The main objective of this component program is to increase community awareness in health through the involvement of communities and provision of continued health education to bring about positive changes in the knowledge, attitude and behavior.

Implementation Modalities of HEP

The main objective of HEP is to improve equitable access to preventive essential health intervention through community/kebele based health services with strong focus on sustained preventive health actions and increased health awareness. This service is being provided as a package focusing on preventive health measures targeting households particularly women/mothers at the kebele level. Cognizant of the fact that HEP implementation throughout the country should be consistent; the Federal Ministry of Health has developed an implementation guideline (5). The guideline is the best tool for the regional health bureaus, woreda health offices, and the health posts (HEWs) to implement community based household focused health care services.

Human Resources

First and for most, trained manpower is one of the prerequisites for a successful program. Therefore, appropriately trained Health Extension Workers (HEWs) is mandatory. Unlike the previous community health agents CHAs), traditional birth attendants (TBAs), and even community based reproductive health agents (CBRHAs), the introduction of the HEWs as community health providers is a paradigm shift, and makes it an innovative approach. Firstly, these categories of personnel are salaried, although voluntarism is still an important factor in community development. Secondly, HEWs are 10^{th} grade complete who received one year training.

Furthermore, subsequent refresher trainings are also provided to HEWs on different RH issues including family planning, VCT promotion, etc. to improve their capacity to handle common community health problems. It involves the use of female HEWs to deliver 16 packages in four main areas such as hygiene and environmental

sanitation, disease prevention and control, family health services and health education and communication on an outreach basis. This program has been piloted over the past three years with early success, and is now being rolled out nationwide. Although conducting normal deliveries is considered one of the responsibilities of the HEWs, their midwifery skills has not been built very well during the one year training. Therefore, the Ministry of Health has a plan to conduct additional midwifery training to fill the knowledge and skills gap that is prevailing among HEWs.

The Kebele Council in collaboration with Woreda Council will recruit these female HEWs who meet the recruitment criteria set by the Ministry of Education. This is followed by one year training in vocational and technical schools (TVTS), and after graduation 2 HEWs per kebele (5000 population) are employed by the Woreda Health Office. Registration and Panel of Assessors procedures after the deployment of these HEWs to each health post. The previous frontline volunteer workers (CHAs, TBAs, etc.) will be incorporated into the system under the guidance and supervision of the HEWs.

In addition, a program to ensure the quality of and demand for clinical care particularly treatment of diarrhea, malaria in children, assisted delivery, early referral for mothers and children with danger signs particularly at the health posts will be strengthened. At the same time, HIV testing and counseling as well as prevention of mother to child transmission services in existing health centers will be made available (4).

Infrastructure

Initially, fourteen technical and vocational training centers were designated to receive the first batch of HEWs as trainees for this program. The Technical and Vocational Training Commission in collaboration with the Regional Health and Education Bureaus were responsible for initiating this program.

The Technical and Vocational Training Schools (TVTS) in seven regions of the country that served as sites for training for the first batch of HEWs were: Tigray (Axum and Mekele), Amhara (Dessie and Debremarkos), Oromia (Goba,

Shashemene, Assela, Metu, Fitche), SNNRP (Dilla, and Butagira), Harari (Harar Medhane Alem), Benshangul Gumuz (Assosa), and Dire Dawa (Dire Dawa TVTS).

Construction and equipping of health posts one per kebele has been successfully carried out, and currently we have 7,161 health posts, and 620 health centers built all over the country.

For the successful implementation of HEP, the Accelerated Expansion of Primary Health Care Coverage activities have been scaled up as an essential framework to reach blanket coverage for almost all the population by 2008. In this regard, new health posts will be constructed and equipped in order to support the provision of preventive and promotive health services to rural populations through HEP.

Training

The Health Extension Package training curriculum was developed by the Ministry of Health in close collaboration with the Ministry of Education. The curricula produced were distributed to 14 TVTS selected to train HEWs. Sixteen different Health Extension Packages were developed in English and Amharic. The first teachers for HEWs (Eighty four public health nurses, sanitarians and health officers) were nominated and received training for one month in training methodology in Addis Ababa. Two thousand eight hundred female students who completed grade ten, from six regional states were enrolled into 14 TVTS in January 2004 for one year training. At present, there are 40 TVTS in all regions of the country. The RHBs facilitated the teaching and learning process by providing logistics and appropriate teaching aids. HEP implementation guideline has been prepared by the HEP Coordinating Office and distributed to RHBs, different departments of the Ministry of Health, donor agencies, and non-governmental organizations. The total number of HEWs trained by 2005/6 was 8,901 (1), and at present this figure has reached 17,500.

Monitoring and Evaluation

Monitoring and evaluation are integral and important part of HEP, and contains both technical and managerial functions and purposes. To carry out monitoring and evaluation activities, the critical issues are setting goals, clear objectives, targets, inputs, outputs, indicators, program activities and management support and resources as well as good information network system.

It is a process of regularly reviewing achievements and progress towards the goal. In this context monitoring is the process of measuring, coordinating, collecting, processing, and communicating on the implementation of the planned HEP. It also involves the use of resource to the management and decision- making by stakeholders (5).Monitoring and evaluation are needed at federal, regional, woreda and health post levels based on the HSDP governance.

There is also a need for effective and efficient management of the program at all levels. At the Federal level, there is HEP Coordinating office, and regional health bureaus have similar offices. More importantly, there is a good monitoring and evaluation mechanism to follow closely the progress of implementation using sensitive indicators including base line surveys. It is also important to continue strengthening effective support mechanisms among the different levels of health care, which includes supervision, refresher training and the referral system.

More importantly, in the long term, the Ministry of Health would like to have the whole program to be integrated with evidence based planning and implementation, and create a strong monitoring and evaluation system with an electronic database system at the central level, as well as regional levels for the follow up of the HEP.

Conclusion

The Government will continue the emphasis of the last six years under the HSDP I and II, and now extending into HSDP III, and this health strategy has targeted the most common poverty-related diseases such as malaria, TB, childhood diseases, HIV/AIDS, and

measures to improve the health of mothers and children. Efforts will be concentrated on rural areas and on extending services outwards from static facilities to reach villages and households. In addition, and most importantly, gender will be mainstreamed at all levels of the health system.

The launching of HEP is one of the landmarks in the history of health service delivery system in the country that shifted services more to address the health needs of rural people who make up of 85 percent of the population. In other words, the HEP for the first time in the history of the country has moved services out from facilities to the household and village level.

So far over 17,500 female HEWs were trained and deployed to deliver basic sanitation, immunization, and other health services. The plan is to achieve blanket coverage in two year's time when 33,200 HEWs are deployed in 10,000 rural and 5,000 urban kebeles all over the country. There is already an increase in health budget from 12 Birr per person in 2001/2 to about Birr 19 per person in 2005, and mobilized additional foreign aid for health programs. Over 1900 new health posts and health centers were built increasing the share of the population living within 10 km. of a health post from 51 percent to 64 percent (6).

The Government's plan under PASDEP includes accelerated expansion to make sure all rural people have access to basic health care by 2010. The two major challenges are training and retaining enough health workers and ensuring there are enough resources and management capacity for recurrent operations and an adequate flow of drugs and supplies. Major efforts will include making available the necessary drugs and supplies, improving training, deployment, and retention of staff, and strengthening drug management.

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Case Report:

Advanced abdominal pregnancy managed at Ambo hospital: A case report

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Abstract

Abdominal pregnancy is a potentially life-threatening form of ectopic pregnancy with a world-wide incidence of 1:3300 to 1:10200 births. Its incidence appears to be increasing in both the developed and developing worlds. It is associated with a high maternal and perinatal mortality. This paper reports a 35 years old G II P I mother from Gindeberet locality, West Shoa, who presented with signs and symptoms of intestinal obstruction in the third trimester of pregnancy which was later diagnosed to be an advanced abdominal pregnancy. Literature is reviewed and challenging diagnostic and management problems are discussed.(Ethiop. J. Reproductive Health, May 2007, 1 (1): 44-51)

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Introduction

About 2% of all pregnancies are ectopic, accounting for 10% of all pregnancy related deaths (1). More than 95% of ectopic pregnancies occur within the fallopian tubes (2).

Abdominal pregnancy, a rare variety of ectopic pregnancy, is defined as an intra-peritoneal implantation that is exclusive of tubal, ovarian or intra-ligamentous implantation. The world-wide incidence ranges from 1:3300 to 1:10200 births and accounts for 1 to 4% of all ectopic pregnancies (3-7). Even more uncommonly does it reach an advanced stage of gestation, and a viable abdominal pregnancy with a successful outcome is a rare event (8-10).

The condition is associated with very high maternal mortality, with reported rates of 0.5 to 18% (1). The major cause for this is massive hemorrhage which may occur during pregnancy, during surgery or in the post operative period. Similarly, the condition is associated with very high perinatal mortality rate of about 95% (1, 11). This is attributed to preterm deliveries resulting from active intervention, done in the majority of the cases as soon as the diagnosis is made.

Diagnosis of abdominal pregnancy is difficult and often missed (1, 4). Symptoms and signs such as abdominal pain, gastro-intestinal symptoms, painful fetal movements, abnormal presentations, uneffaced and displaced cervix, vaginal bleeding, palpation of pelvic mass distinct from the uterus, inability to stimulate uterine contraction with oxytocin, are considered suggestive evidences of an abdominal pregnancy (3, 4).

This paper reports a 35 years old gravida two para one mother who was 7 months pregnant and presented with sign and symptoms of intestinal obstruction and later diagnosed to have an advanced abdominal pregnancy which was managed at Ambo hospital.

Case Report

The patient was 35 years old gravida two para one mother from Gindeberet, West Shoa, who was amenorrhic for seven months with abdominal pain and failure to pass feces for one week with subsequent failure to pass flatus and vomiting of ingested material since one day prior to her presentation to Ambo Hospital, West Shoa, Ethiopia.

Initially she was seen at the surgical department and was admitted as a case of intestinal obstruction in the third trimester of pregnancy. After further work up she was transferred to the obstetric department with the diagnosis of advanced abdominal pregnancy.

She had no antenatal follow-up. She said that pregnancy was uneventful before the onset of the above symptoms. She used to feel fetal movements. She is married and a farmer.

During examination, she was acutely sick looking. Vital signs were stable with blood pressure of 120/60 mmHg, pulse rate of 88/ min, and a temperature of 36.6 degrees Celsius.

On abdominal examination, it was grossly distended and difficult to appreciate fetal parts and presentation. Abdomen was diffusely tender with hyperactive bowel sounds. Fetal heart sounds were heard.

On pelvic assessment, cervix was closed uneffaced, and it was pushed anteriorly. There was a soft bulge at posterior cul-de-sac.

Hematocrit was 30% and on abdominal ultrasound examination there was an alive fetus and it was difficult to measure BPD because of irregular contour of the skull bones. There was scanty amount of amniotic fluid. There was small sized uterus posterior to urinary bladder. Just posterior to the uterus, there was a homogenous echogenic mass occupying the posterior cul-de-sac and which looked like the placenta (Fig.1).

With the assessment of an abdominal pregnancy and intestinal obstruction laparotomy was performed, and the intra-operative finding was that there were grossly distended small bowel loops. When the small intestine was exposed, there was an intact gestational sac free in the peritoneal cavity extending to the posterior cul-de-sac and there was a viable fetus inside the sac. The urinary bladder was edematous and non pregnant size uterus was found just posterior to bladder. The fallopian tubes and both ovaries were intact but edematous.

What we did was that we opened the gestational sac and clear liquor came out. A female fetus weighing 900g was extracted. The placenta was found in the cul-de-sac and it had attachments to the posterior wall of uterus, pelvic peritoneum of posterior cul-de-sac and part of anterior wall of rectum. It was

removed completely with the gestational sac. Peritoneal cavity was lavaged with copious amount of saline.

Post operative hematocrit was 20% and the patient was put on IV triple antibiotics and she was supplemented with iron tablets for 3 months. She was discharged on the sixth post operative day with improvement and was appointed to regular Gynecologic OPD but she was lost to follow up.

On examination of the fetus there were deformities over the head and both lower extremities. She was put under radiant warmer, oxygen through nasal catheter was given, and NG tube was inserted for feeding. Umbilical catheterization was attempted by the pediatrician but failed. The fetus was able to survive for 36 hours then expired (Fig.2).

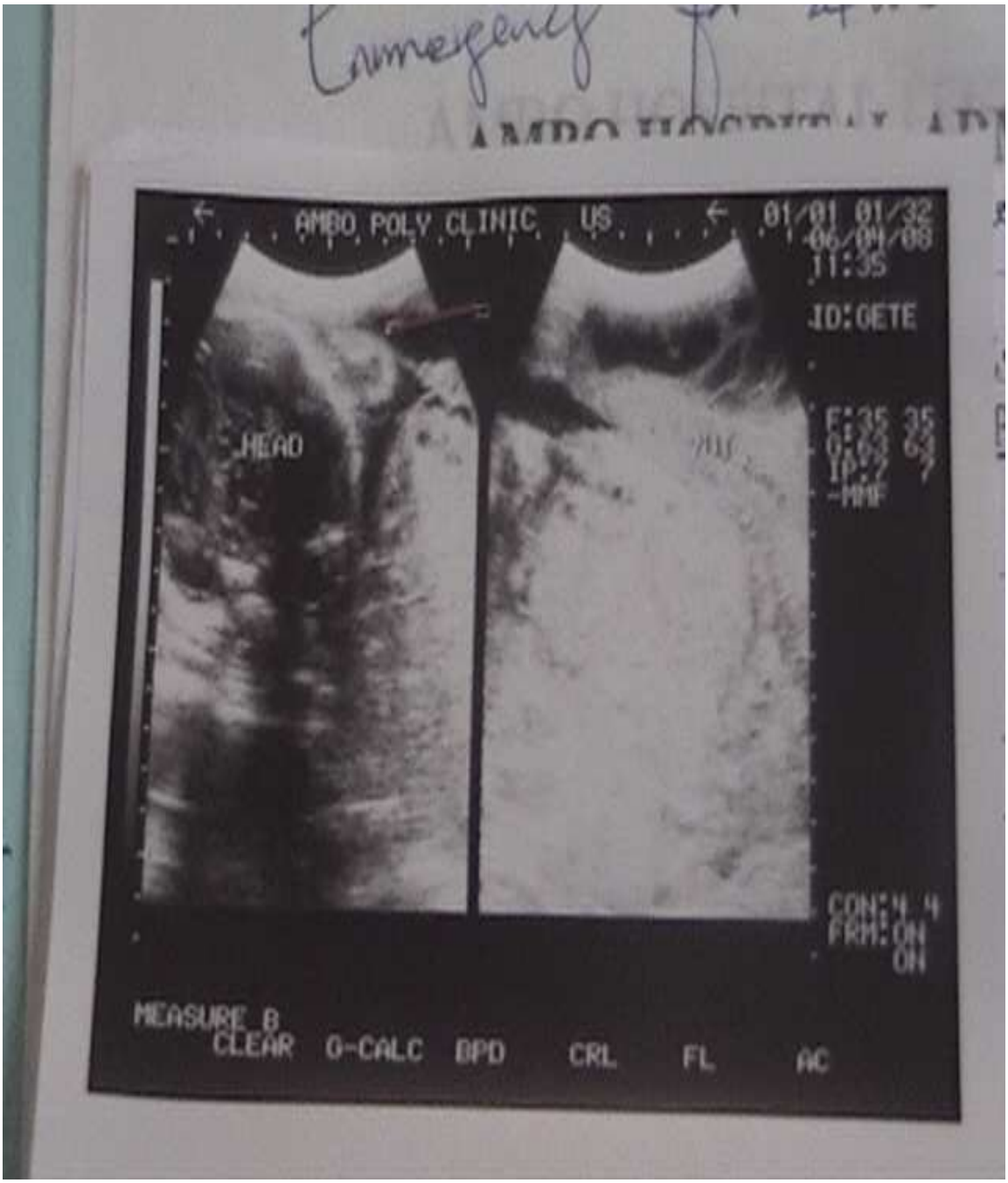

Fig.1: Abdominal ultrasound showing an empty uterus separate from the gestational sac and the deformed fetal skull.

Fig.2: The fetus from abdominal pregnancy with multiple compression deformities

Discussion

The incidence of abdominal pregnancy appears to be increasing in both developed and developing countries (11). In the former, increasing use of assisted reproductive technology with embryo transfer has been associated with increasing numbers of heterotopic pregnancies (12-15). In developing countries, particularly in the rural areas, a high incidence of abdominal pregnancies is reported, presumably due to restriction of human resources and diagnostic facilities, and poor utilization of medical care by pregnant women (16-18). Under both circumstances, some undiagnosed tubal pregnancies may abort into the peritoneal cavity, implant and continue into advanced abdominal pregnancies.

The clinical presentation depends on the gestational age: in the first trimester,

symptoms are similar to those of tubal ectopic pregnancies. In the second or third trimesters, the diagnosis may be suspected because of an abnormal fetal presentation, signs and symptoms of intestinal obstruction, displaced uterine cervix or easily palpable fetal parts (6). In our case, the patient presented with signs and symptoms of intestinal obstruction in the third trimester of pregnancy.

To diagnose an abdominal pregnancy on ultrasound, one should try to delineate the uterus as a separate structure from the fetus and placenta. Sometimes even under best circumstances, and using sonography, the diagnosis is often missed (6, 19-21). On ultrasound examination of our case, it was possible to demonstrate intra-abdominal pregnancy with placental implantation outside a non pregnant size uterus.

CT scan and MRI have been used successfully to complement sonography in making an accurate diagnosis of abdominal pregnancy (1, 22-25).

Once the diagnosis is made, optimal management requires careful evaluation and planning. If it is diagnosed in the first trimester or in early second trimester, the management is surgical intervention without delay. However, due to late presentation of cases, the condition may remain undiagnosed until viable stage of gestation, i.e. after 24 weeks of gestation.

The major questions raised in such cases are related to the timing and mode of delivery. Although no consensus exists on the issue, a conservative approach is proposed in the absence of fetal gross malformation, placental implantation remote from the upper abdomen, good maternal condition, and close management in a tertiary care hospital (7). In our case, conservative approach had no place because she presented with signs and symptoms of intestinal obstruction.

Similarly, no consensus exists on the management of the placenta and each case is managed on an individual bases according to intra-operative findings. Regardless of gestational age, removal of placenta can result in hemorrhage. Unless the entire blood supply of placenta can be ligated, it is best to leave the placenta *in situ* and then follow the patient with serial B-hCG levels and sonography [6, 24, 28]. In the present case, the implantation site was in the lower part of abdomen at *cul-de-sac*.

The major arterial supply of the placenta was identified and was ligated. The whole part of placenta with gestational sac was successfully removed. Since the patient came from remote area, it would have been difficult to leave the placenta behind and to have regular follow-up, especially with the unavailability of B-hCG determination.

Some have advocated the use of methotrexate with varying degree of success. Risks associated with leaving the placenta *in situ* include bowel obstruction, fistula formation and sepsis as the placental tissue degenerates (1).

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Original Article

SURVEY OF UNSAFE ABORTION IN SELECTED HEALTH FACILITIES IN ETHIOPIA

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Abstract

In order to fill the gap in evidence based information, and help in programming for the reduction of maternal deaths due to unsafe abortion, a nationwide hospital based survey in 9 of the 11 administrative regions of Ethiopia was conducted from June to December 2000.

A total of 1075 women presenting with abortion to the 15 hospitals during the study period were consecutively enrolled . About 58 percent of the cases were in the age range of 20-29 years, 26.5 percent were illiterate, and 27.5 percent were with secondary education. Three-fourth of patients had spontaneous abortion and one fourth (25.6 percent) of them had induced abortion. The majority of women (87 percent) were aware of contraceptive methods, but only about half of them ever used a family planning method. Of those pregnancies that ended in abortion 60 percent were unplanned and 50 percent were unwanted. Method non-use was responsible for 78 percent of pregnancies that occurred. Among those with induced abortion, the most common reason for termination of pregnancy was contraceptive need. Rape accounted only for 3 percent of all pregnancies that ended in abortion (i.e. 2.5 percent of all reasons for termination of pregnancies). Fifty eight percent of women who induced abortion terminated the current pregnancy either by seeking the help of untrained personnel or by themselves with no assistance. *The most frequent reason for hospital visit was vaginal bleeding and abdominal pain. Evacuation and curettage (E & C) was the commonest method (83.6 percent) of evacuating the contents of the uterus. The major categories of complications identified were infection (28 percent), genital tract injuries (12 percent), foreign bodies in the genital tract (1.6 percent) and organ failure (13.1 percent). There were 13 deaths, which made an overall procedure related deaths of 1,209 per 100,000 abortions. Using a modified Delphi technique, and taking the six months study period, it was found out that the total cost to treat incomplete abortion by health facilities under this survey was Birr 332,259.9. In conclusion, there is a need for a strong family planning program for the country, to prevent unwanted and unplanned pregnancies. There is a also an urgent need for improvement of providers knowledge and skills, provision of safe abortion services, and liberalization of the abortion law.*

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Introduction

Unsafe abortion is a preventable tragedy and is one of the neglected problems of heath care in developing countries including Ethiopia. Annually, an estimated 25,000 women die of pregnancy and delivery complications in Ethiopia (1) and the maternal mortality ratio (MMR) was estimated to be 871 per100, 000 live births (2). Unsafe abortion has a significant contribution to this high MMR.

A community-based study conducted in Addis Ababa in 1985 revealed that unsafe abortion was the commonest cause of maternal death (3). Furthermore, subsequent hospital-based studies in Addis Ababa, reported that abortion accounted for 22.2% and 52.2% of all maternal deaths (4,5). A report from the Ministry of Health also showed that abortion was the leading cause of hospital admission for women in 1994/95, and it was the second most frequent cause of death next to tuberculosis in the same year (6). These findings indicated that illegal and unsafe abortion was a serious public health problem.

Although after the International Conference on Population and Development (ICPD) (7), the abortion issue received a lot of attention mainly because of its serious health consequences. However, lack of reliable information or shortage of necessary data on this problem has hampered a number of activities that would have helped in ameliorating the situation. The objective of the study was to describe the magnitude of abortion, the socio-demographic characteristics of women with unsafe abortion and the complications and outcome of abortion in a representative sample of health facilities. Moreover, identifying the factors and reasons associated with unsafe abortion as well as conducting cost analysis using the modified Delphi technique was also the focus of this study.

Subjects and Methods

This is a cross-sectional study, which was conducted from July to December 2000 in 15 hospitals in 9 regions of the country on the magnitude and complications of abortion. Hospitals from two regions (Benshangul-Gumuz and Harari) were invited to participate but latter failed to do so. However, the population under study constituted over 98 percent of the population of the country (7).

A pre-tested questionnaire with major socio-demographic characteristics, reproductive health history, contraceptive knowledge, attitude and use, reasons and conditions for

induced abortion, history of present illness, complications and outcome of abortion was administered. A checklist was also prepared on physical examination, laboratory and other investigations, drugs, and procedures undertaken and costs for the care of the patient. Trained obstetricians and gynecologists working in the selected hospitals administered the questionnaire and checklist after receiving consent from study subjects. In hospitals where there are no specialists, general medical practitioners were identified to carry out the survey.

For cost analysis, the modified Delphi technique was adopted for this particular survey as there were no standard payments for services, and costs for medications/drugs vary from institution to institution in the public and private sectors. A panel of experts was established to develop models of resource-use addressing three clinical conditions of unsafe abortion (mild, moderate and severe) detailed in Table 1.

Members of the panel comprised of obstetricians/gynecologists, general medical practitioners, midwives and nurse anesthetists at federal and regional levels.

By applying this consensus building qualitative method, it was possible to estimate the direct medical cost that has been incurred by facilities surveyed. The application of the modified Delphi technique required identified experts to be communicated more than once (not more than three times) on this issue. Moderators collected and compiled information from the panel and communicated back results for consensus. Communication was pursued through mail or hand delivery in order to maintain anonymity of members of the panel to avoid peer pressure and senior staff influence on the group.

All institutions which participated in the study were included in the study after a written institutions consent to participate was secured after which the Ethiopian Science and Technology Commission provided the ethical clearance for the study

Results

A total of 1075 cases of abortion were included in the study. Table 2 shows the socio-demographic characteristics of the patients who presented with incomplete abortion in health facilities. Women in the age group 20-29 accounted for 58.3 percent of all cases. Fifty three percent were housewives; sixty percent were married, while the rest were single. Students accounted for 14.6 percent of all cases. Although the majority of Ethiopian women

are illiterate, a high proportion of the patients had educational status of primary school or higher. The majority are Orthodox Christians. Amhara and Oromo accounted for 48 percent and 20 percent of all cases, respectively. The distribution of patients by region shows that the majority were from Amhara (27.6 %), Addis Ababa (25 %), Tigray (15.9 %), and Oromiya (13.2 %).

The leading institutions that reported the highest number of abortion cases were Gondar (16.8 %), Mekele (15.7 %), Ghandi Memorial (12.8 %), and Yekatit 12 (10.1 %) Hospitals.

The reproductive characteristics of the study population are detailed in Table 3. One third of the respondents had no previous pregnancy and delivery experiences. Three fourth had no previous history of abortion and ninety percent had no history of induced abortion. The distribution of women by type of abortion revealed that 800 women (74.4%) had spontaneous abortion and 275 (25.6%) had induced abortion.

Looking at the contraceptive knowledge and use profile of the women, one could note the wide discrepancy in the knowledge and use rate of modern methods of contraception. Eighty six percent revealed knowledge of contraception whereas 46.3 % expressed use and 24.7 % revealed use of a method of contraception prior to the current abortion. Further, more than 50% of all the pregnancies were either unwanted and/or unplanned.

Three hundred seventy seven (35.3%) were unplanned, and 525 (49.1%) were unwanted. Non-use of method was responsible for 78% of pregnancies; 19% women reported that unwanted pregnancy occurred due to contraceptive failure, which has important implications for the provision of appropriate family planning services.

Partner decision alone as a reason for termination accounted for 9.3% of all cases, and rape accounted only for 3% of all pregnancies that ended in unsafe abortion, which was 2.5% of all the reasons for interfering with pregnancies (Table 4).

Fifty eight percent of all cases terminated the current pregnancy either by seeking the help of untrained personnel or themselves with no assistance. Of those women with induced abortion, two hundred fifty nine patients identified the person who initiated the abortion.

Many categories of health workers were involved in providing termination service of which health assistants rank first and pharmacists rank last. Five hundred and forty (65%) of all the interviewees and 181

(70%) of women with induced abortion were aware that abortion was associated with such grave complications like death, bleeding, genital tract injury, infertility and HIV infection as possible risks.

The reasons for hospital visits are shown in Table 5. A patient may present with more than one symptom. The most frequent reason for hospital visit was vaginal bleeding (89.3%, n=960), abdominal pain (43.7%, n= 470), abortion (17.9%, n=192), fever (12.3%, n=132), vaginal discharge (10.6%, n=114), and others (4.5%, n=49). The most common method of evacuation was evacuation and curettage (83.6%) and MVA was employed to a much lesser extent (11%).

The distributions of complications of induced abortion are depicted in Table 6. The major categories of complications identified were infection, genital tract injuries and foreign bodies in the genital tract, which accounted for 28.4%, 12%, 1.6%, respectively. A total of 13 deaths were reported, which makes the overall procedure related death of 1,209 per 100,000 abortions.

Comparison of cases with induced abortion with the spontaneous group showed that women who presented with induced abortion were younger than those who presented with spontaneous abortion. The mean age of women with induced abortion was 22.9 ±5 years whereas the mean age of women with spontaneous abortion was 26.3 ±6 years. The difference was statistically significant ($p < 0.00001$). The mean parity of women with induced abortion was 0.8± 1, and that of women who presented with spontaneous abortion 2.0 ±2. The difference was statistically significant ($p<0.00001$).

The odds of dying from induced abortion are more than four times higher in the induced group compared to the spontaneous group (Table 6). The same Table indicated that more women with induced abortion were from urban areas than from rural areas. There was no statistically significant difference between induced and spontaneous group in the incidence of rape.

The panel of experts after considering the different clinical scenarios presented to it by the moderators, and taking into account the resources used to treat incomplete abortion by category of severity (Table 7) came up with reasonable and more accurate resource expenditure in the management of incomplete abortions. It was found out that for 450 mild cases of incomplete abortion, the cost of treatment was Birr 55,813.50. The highest resource expenditure was for 610 moderate cases, which resulted in Birr 261,332.85 for treatment.

As the number of severe cases was few who underwent laparotomy (15 patients), the cost of treatment was only Birr 15,113.55. However, the total cost for the treatment of incomplete abortion incurred by health facilities under this survey was Birr 332,259.90. The average cost therefore, for the treatment of incomplete abortion per woman in government health facilities was estimated at Birr 309.08. This cost estimate showed the direct medical cost incurred without taking into account depreciation costs of facilities, and medical equipment. Other opportunity costs like absence from work, school, and time lost in providing household care, etc. were difficult to either measure or estimate.

When the average cost of treatment was disaggregated by severity of illness, it was found out that the direct medical cost showed a progressive increment with the severity of illness. Accordingly, the cost for mild abortion was Birr 124.03, for moderate Birr 428.11, and for severe abortion was Birr 1007.54. This showed that the cost for moderate and severe abortion was more than three-fold and 8-fold, respectively when compared to the mild abortion cases.

Table 1: Categories of Severity of unsafe abortion used for the modified Delphi technique

Category	**Procedure**	**Treatment**
Mild	E & C for incomplete abortion without complications	E & C, antibiotics, uterotonics
Moderate	E & C for incomplete abortion with anemia, infection, hemorrhagic/septic shock	E & C, antibiotics, uterotonics, IV fluid, blood
Severe	Laparotomy for perforated uterus,pelvic abscess, and/or generalized peritonitis	Laparotomy, antibiotics, uterotonics, IV fluid, blood

Table 2: Distribution of women who presented with abortion in selected health institutions in Ethiopia by socio-demographic characteristics

Variables	Number	Percent
Age in years		
<20	173	16.2
20-24	312	29.2
25-29	311	29.1
30-34	154	14.4
35-39	88	8.2
40-45	31	2.9
Occupation		
House wife	569	53.2
Student	156	14.6
Govt. employee	111	10.4
Unemployed	90	8.4
Others	145	13
Marital status		
Married	708	66.1
Single	286	26.7
Divorced	28	2.8
Widowed	15	1.4
Separated	4	0.4
Education		
Illiterate	284	26.5
Read and write	108	10.1
Primary school	182	17
Junior secondary	164	15.3
Secondary school	294	27.5
University/college	38	3.6
Religion		
Orthodox	514	47.9
Muslim	218	20.4
Protestant	191	17.8
Catholic	66	6.2
Others	82	7.6

Table 3: Distribution of women who presented with incomplete abortion in selected health institutions by their reproductive performance

Characteristic	Number	Percent
Gravidity		
1	371	34.6
2-4	488	45.6
5-13	213	19.8
Parity		
0	371	34.6
1	298	27.8
2-4	289	26.9
5-11	113	10.5
Previous Abortion		
0	848	78.8
1	159	14.8
2	41	3.8
3	10	0.9
4	6	0.5
5-12	8	0.7
Previous Induced Abortion		
0	993	92.3
1	66	6.1
2	9	0.8
3	5	0.4
4	1	0.1
5	1	0.1

Table 4: Distribution of women who presented with induced abortion in selected health facilities by reasons for terminating pregnancies (n=399)*

Reasons	Number	Percent
Need for spacing or not wanting a child	270	67.7
Partner decision	37	9.3
Societies disapproval	37	9.3
Medical reasons	11	2.7
Rape	11	2.7
Others	33	8.3

*****A woman can give more than one reason

Table 5: Complications identified in women who presented with abortion to selected health facilities.

Type of complication (N=1075)	**Frequency**	**Percent**
Infection	306	28.4
Endometritis	125	
Sepsis	69	
Pelvic peritonitis	29	
Septic Shock	27	
Salpingitis	18	
Generalized Peritonitis	9	
Pelvic Abscess	7	
Tetanus	4	
Other	18	
Gential Tract Injury	129	12
Cervical Tear	90	
Vaginal Laceration	28	
Uterine Perforation	8	
Other Traumas	3	
Foreign Body	17	1.6
Cervix	7	
Uterus	7	
Vagina	3	
Organ Failure	4	
Congestive Heart Failure	15	
Shock	9	
DIC	5	
Renal Failure	5	
Other	13	
Death	13	1,209*

Table 6: Comparison of cases with induced and spontaneous abortion by selected Characteristics

Categories	Induced Abortion	Spontaneous Abortion	COR* (95%CI)
Place of Residence Urban Rural	 250 25	 619 179	2.8 (1.8-4.6)
Days of presentation Non working days Working days	 94 154	 216 513	1.45 (1.06-1.98)
Knowledge of contraception No Yes	 22 253	 122 678	2.06(1.2 - 3.5)
Rape Yes No	 11 202	 8 342	2.33 (0.85-6.46)
Outcome Dead	 8	 5	4.7 (1.39-16.79)

* COR = Crude Odds Ratio

Table 7: Hospital costs of unsafe abortion by category of severity.

Category	Hospital Stay	Procedure	Drugs & Supplies	Total
Mild	2,137.50	33,750	19,926	55,813.50
Moderate	12,361.75	75,000	173,971.10	261,332.85
Severe	712.5	1,350	13,051.05	15,113.55
Total	**15,211.75**	**110,100**	**206,948.15**	**332,259.90**

Discussion

This survey clearly showed the serious problem of unsafe abortion in Ethiopia. The huge unmet need in family planning coupled with poor knowledge and skills of services providers in MVA techniques to avail the necessary services, lack of safe abortion services due to the failure to recognize unsafe abortion as a serious public health problem has led the situation to deteriorate further.

Among induced abortion cases the most common reason for termination of pregnancy could be attributed to contraceptive needs. Either the women decided to space or did not want a child at the time of abortion. This may point to certain important facts including the unmet need for contraception and possible use of abortion as a family planning method. In this survey, about two thirds of the respondents tried to terminate pregnancy for contraceptive reasons at the time abortion, as they had decided to space or have no more children. The recent Demographic health survey (DHS) (2) underscored the very low contraceptive prevalence rate (CPR) (6%)for modern methods and 8% for all methods combined, and the unmet need for contraception, which was 40% among married women (2).

It is important to note that the proportion of women with induced abortion is higher in women with adequate knowledge of contraceptives. Therefore, looking at the contraceptive knowledge and use profile of the women, one could observe the wide discrepancy in the knowledge and use rate of modern methods of contraception. Most women in this study who resorted to unsafe abortion did not use a method even when the pregnancy was unwanted and unplanned.

The fact that 58% of the pregnancy terminations were initiated by the pregnant women themselves or by untrained personnel like friends, relatives or other acquaintances of the woman showed how much desperation or determination there were in the women with unwanted or unplanned pregnancy to get rid of the pregnancy.

In addition, the majority of health professionals reported to have conducted the procedure included those who were not formally trained (health assistants, nurses and pharmacists), and are highly likely to lack the necessary skills to safely undertake such procedures. This state of affairs very

much increases the procedure related complications.

The case fatality rate (CFR) for abortion in this study is very high even by African standard where procedure related deaths are reported to be 600 deaths per 100,000 procedures. The procedure related deaths for developed countries is about 30 deaths per 100,000 procedures (8).

Comparison of deaths between spontaneous and induced abortion cases showed that women with induced abortion had more than four times chance of dying from abortion. This is expected, as women with induced abortion are likely to have infection, bleeding, perforation and other complications.

Hospital costs for incomplete abortions are very high. Using a combination of primary data generated from this study and secondary data from national figures, it was found out that abortion accounted for 7% (hospital data) of all deliveries. However, the abortion rate can reach as high as 15% of all deliveries. This survey revealed that the mean cost of medical care for abortion treatment is Birr 309, and death secondary to unsafe abortion (the case fatality rate) was 1209 deaths per 100,000 abortions.

On the other hand, taking the national crude birth rate at 40 births per 1000 population, and the health service coverage at 50% (2) as secondary data, one could get an estimated 3 million births per annum with an estimated 212,000 abortion cases in the country. Taking the above CFR, there will be an estimated 2,571 deaths from abortion complications alone. This shows the gravity of the abortion situation in the country. Moreover, with the above estimated abortion cases, the total medical cost incurred for the treatment of these cases will be close to Birr 65 million. Taking the health service coverage into consideration, and the availability of existing services, at least 50% of the estimated cost, which is over Birr 32 million, could be incurred by patients or the health service or both.

Conclusion

Although most respondents 86.6% were aware of family planning methods only 24% had used the services prior to the current abortion. This calls for further study to assess why women are not using contraceptives when they know more about them and yet resort to dangerous abortion procedures. It is of paramount importance to strengthen the national family planning program with effective coordination of the efforts of all stakeholders to enable women have access to quality information, counseling and services in order to minimize unwanted and unplanned pregnancy and the resort to unsafe abortion.

Over 45% o all abortions occurred in adolescents and the younger age group that are more likely to have irregular, unplanned, hurried and clandestine sexual behavior.

Under such circumstances, use of emergency contraception can prevent a lot of unwanted pregnancies and hence reduce unsafe abortion. Therefore, introduction and promotion of EC in the country would greatly reduce the rate of unwanted pregnancy and thereby decrease the high maternal deaths associated with unsafe abortion. Majority of service providers (81%) resorted to sharp metallic curettage as opposed to MVA (11%), which is currently considered a safe method. Furthermore, mid-level health workers initiated 27.8% of all abortions, which is an important role in abortion care provision. Although this activity is not formally recognized by the public sector, there is an urgent need to recognize this role, and organize trainings on post abortion care (PAC) at all levels. Therefore, there is a need for initiating and strengthening a national training and services program on PAC.

Contraceptive method failure was responsible for 18% of all pregnancies that resulted in unsafe abortion, and was the second commonest reason for occurrence of unwanted and unplanned pregnancies. Rape also contributed 3% of abortion cases. Until safe abortion services are available on demand, it is a high time that those women who become pregnant subsequent to method failure and rape be provided with safe abortion services.

Unsafe abortion should get the necessary recognition as a major public health problem in the country. This recognition is expected to lead for the liberalization of the abortion law in the country. In this regard, conducting an advocacy work among policy makers by utilizing information generated from this study and from within the country would help to bring about a change in the abortion law.

The above cost projections that were calculated clearly demonstrate the fact that abortion is not only a public health problem of national significance in terms of morbidity and mortality, but it has also got an economical dimension, which should not be underestimated. It is necessary therefore to conduct the necessary advocacy work at federal and regional levels particularly on the cost issue. It is understood that the available meager resources of the country should not be consumed for the treatment of abortion.

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Original Article

Uterine perforation following abortion in Tikur Anbessa Hospital, Addis Ababa, Ethiopia: A case series study

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Abstract

***Objective**: determine incidence, describe patient characteristics, examine clinical presentation, associated complications and describe mode of management of cases with uterine perforation.*

***Methods**: Operation registry, abortion care logbook and patients' clinical records were reviewed in a teaching hospital in Addis Ababa, Ethiopia, between January 1, 1999 and December 31, 2000. Cases with laparatomy proven uterine perforation are described.*

***Setting**: obstetric and gynecologic department of a tertiary referral and teaching hospital in Addis Ababa, Ethiopia.*

***Outcome measures**: clinical presentation, intraoperative findings, site of perforation, mode of management, associated complications and outcome of treatment.*

***Results:** there were a total of 927 abortions of which 25 were laparatomy proven cases of uterine perforation following unsafe abortion, making the prevalence 27/1000 abortions. Majority were fond to be single, nulliparous, young and dependent member of the family. In 36% (9/25) termination was attempted after 14 weeks of gestation. Plastic and metallic materials are used frequently. Eight of the cases came after seven days of interference. The main clinical presentations were: abdominal pain (100%), signs of peritonitis (100%), pallor (96%), fever (76%) and vaginal bleeding (76%). Common intraoperative findings include abdominal abscess, adhesions, and inflamed ovaries and tubes. Frequent areas of perforation are posterior aspect of the body and cervico-isthmic region of the uterus. Drainage and lavage of the abdominal cavity (80%), hysterectomy (76%) and removal of adnexa (60%) were mainstays of management. All cases had sepsis and peritonitis, 24 had anemia, nine suffered from adult respiratory distress syndrome and eight developed wound infection. Duration of hospital stay ranged from one to 45 days. The case fatality rate was 32% (8/25). Only six came back for follow up.*

***Conclusion**: Uterine perforation is associated with increasing number of complications including death. Physicians catering the health care of women with unsafe abortion shall exhibit a high index of suspicion for uterine perforation. (Ethiop. J. Repro Health May 2007, 1(1):17-27)*

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Introduction

Worldwide, there are 30 - 50 million induced abortions that result in the death of 80,000 - 110,000 women of which an estimated 34,000 are in Sub - Saharan Africa (1). One of the causes of death is uterine perforation, which is particularly dangerous if the abortion is unsafe or is not recognized in time. The incidence is estimated to be 0.2 - 15/1,000 abortions.

Depending on the setting, instruments used to terminate pregnancy can be plastic material, plant roots, metallic rods or sharps, or surgical instruments like dilators and curettes (2,3,4).

Reports from different settings have identified risk factors, sites of perforation, clinical presentations, method of diagnosis and outcome. In one study most perforations (64%) occurred in the corpus and the remaining 36% in the cervico-isthmic region (2, 5).

Associated complications also vary depending on the circumstances of the procedure. In reports where abortion is legally procured the complications mainly are bleeding and trauma to other visceral organs (5)**.** On the other hand, unsafe abortion is commonly associated with sepsis, anemia, and hypovolemic shock (3, 4).

Recommended management options for such case are repair, evacuation and curettage under direct visualization followed by repair, total abdominal hysterectomy with or without oophorectomy, subtotal hysterectomy, repair of bowel, or colostomy with subsequent closure. If the abortion is safely procured vigilant observation and oral antibiotic therapy can be all one should do (7, 8, 9).

Like in other areas where abortion is unsafely procured, we encounter cases of uterine perforation in our practice. Specific study with regard to uterine perforation, however, is not reported in the Ethiopian setting. Thus, this study was carried out to determine the incidence, clinical presentation, site of perforation, mode of management, associated complications, and outcome of women with uterine perforation in a teaching hospital. This study will provide a baseline data and help in generating hypothesis for future large-scale studies.

Materials and Methods

This is a case series of uterine perforation in two years between September 11, 1999 and September 10, 2001 in a tertiary university hospital, Addis Ababa, Ethiopia. The study subjects are all cases of uterine perforation who presented to the study hospital during the specified period, and the diagnosis is confirmed at laparatomy. Uterine perforations that are not due to abortion, suspected cases that responded to conservative management, charts with incomplete information and cases whose charts could not be retrieved are excluded from the study. But, in the later two conditions the number is considered to estimate the prevalence.

Total number of abortions was obtained from the abortion registry logbook both in the wards and the out patient department. The number of cases of uterine perforation is obtained from the major operation registry. Charts of the cases was obtained from the hospital registrar after proper procedures and the following information was collected; sociodemographic data, reproductive history, conditions around the termination of the pregnancy, clinical presentation, operative findings, site of perforation, mode of management, presence of complications and outcome of treatment.

The relevant information was obtained from each patient's clinical record. Data was collected and computed manually. Simple percentage is used for description of frequency of data. Information in the patients' charts was kept confidential.

Results

There were a total of 927 abortions during the two years of the study of which 25 had laparatomy proven uterine perforation. This makes the prevalence 27/1000 abortions. Two third, 16/25, of the cases were young women under 25 years old. Socio demographic data is shown on Table 1.

Table 1. Sociodemographic characteristics of cases of uterine perforation in a university teaching hospital, Addis Ababa, Ethiopia. September 1999-2001.

Age	**Number**	**%**
15 – 19	5	20
20 – 24	11	44
25 – 29	7	28
30 – 35	2	8
Parity		
Nullipara	13	52
I-IV	11	44
Unknown	1	4
Marital Status		
Single	18	72
Married	4	16
Divorced	2	8
Unknown	1	4
Occupation		
Unemployed	5	20
Student	5	20
House wife	3	12
Housemaid	3	12
Others *	5	20
Unknown	4	16

**This includes merchants, commercial sex workers, private workers*

One in five cases denied any attempt to terminate the pregnancy. Termination was performed in private health institutions, backstreet and at home in seven, six and two cases, respectively. Place of interference is unknown in the remaining 10. Plastic materials were used for interference in eight, metals in five and plant root and wooden material in one each. In 36% (9/25) termination was attempted after 14 weeks of gestation.

Seven cases came within three days of interference, 10 came between the third and seventh day and the rest eight came after a week has passed. Abdominal pain, abnormal vital signs, pallor and signs of peritonitis were found to be consistent symptoms and signs in cases with uterine perforation. Clinical information is shown in Table 2.

Table 2. Clinical presentation of 25 cases of uterine perforation in university teaching hospital, Addis Ababa, Ethiopia. September 1999-2001.

Clinical Signs/symptoms	**Frequency ***	**%**
Abdominal pain	25	100
Signs of peritonitis	25	100
Pallor	24	96
Vaginal bleeding	19	76
Fever	19	76
Adnexal mass	14	56
Chills/rigors	9	36
Offensive vaginal discharge	8	32
Vomiting	7	28
Abdominal distention	5	20
Diarrhea	4	16
Others *	12	64

** Rounding up is far from 100% because multiple complaints is the rule than the exception*

*** These include poor appetite, passing air and feces through vagina, visible loops of bowel through vagina, jaundice, traumatized birth canal and change of sensorium.*

Only one patient had a hematocrit in the normal range, four women had hematocrit less than 20%. WBC was less than 10,000 in one third.

Culdocentesis was done in eight cases of which five revealed non clotting blood and three purulent fluids. Uterine sounding was diagnostic in six of the nine in whom it was attempted. In the remaining three the defect was not identified preoperatively.

Ultrasound showed fluid only in two out of seven.

Intraoperatively, nine of the 24 women had a uterine size of greater than 12 weeks. Two had a normal sized uterus. Bowel injury was described in six of the 25; one at the ileocecal junction, one on the rectum and four on the ileum. Documented operative findings are shown on Table 3.

Table 3. Operative findings in 25 cases of uterine perforation in university teaching hospital, Addis Ababa, Ethiopia. September 1999-2001.

Finding	**Number**	**%**
Abscess	16	64
Inflamed ovary	14	56
Inflamed tubes	13	52
Adhesion	11	44
Blood in abdominal cavity	10	40
Bowel injury	6	24

The site of perforation was the posterior and anterior aspect of the corpus in 11 (44%) and 4 (16%), cervico-isthmic 7 (28%), lateral in 2 (8%) and cornual in one case. The duration of operation was more than 60 minutes in 21 (84%) and more than 120 minutes in 9 (32%).

Mode of management is described on Table 4.

Of the total 25 cases seven were admitted to surgical ICU for respiratory support. Surgical consultation for bowel injury and medical consultation for adult respiratory distress syndrome was made for five and three cases, respectively.

Table 4. Mode of management of the 25 cases of uterine perforation in university teaching hospital, Addis Ababa, Ethiopia. September 1999-2001.

Operative management	Number	%
Drainage and lavage	21	84
Hysterectomy *	19	76
Adnexectomy **	15	60
Adhesiolysis	11	44
Repai of uterine defect	5	20
Uterine curettage	5	20
Resection and end to end Anastomosis	4	16
Colostomy and repair of rectum	1	4

**Subtotal hysterectomy was performed in four cases*

***Unilateral adnexectomy was performed in three cases*

^bruise on ileocecal junction was left alone

Table 5 shows complications that developed in patients with uterine perforation. Hospital stay ranged from one to 45 days; the mode was six and the median 10. There were eight maternal deaths making the case fatality rate of uterine perforation presenting to our hospital 32%. Only six women returned for follow up.

Table 5. Associated complications in 25 cases of uterine perforation in university teaching hospital, Addis Ababa, Ethiopia. September 1999-2001.

Complications	**Frequency**	**%**
Peritonitis	25	100
Sepsis	25	100
Anemia	24	96
ARDS	8	32
Wound infection	8	32
Septic shock	6	24
16Renal failure	4	16
W12ound dehiscence	3	12
DIC12	3	12
Hypoc8alcaemia	2	8
Relapar4atomy	1	4

Discussion

A number of complications are described following induced abortion. One serious complication is uterine perforation that occurs in 0.2 - 15 cases per 1000 induced abortions depending on the population studied (5, 10). The rate in our hospital, 27/1000, is far more common than the reported range.

Several studies from different corners of the world have identified risk factors that operate individually or in combination. These risk factors include position of the uterus during procedure, gestational age, skill of the provider, higher order parity, the place where it is procured, and the instruments used to induce the abortion (5, 7, 10).

The perforating instruments are mostly unknown, but depending on the setting it may vary from medical instruments to twigs of plants, plastic and metallic materials. For example, one study done in five hospitals in Addis Ababa showed that metallic rods, plastic materials and plant roots are the common substances

used to induce abortion (2). Another study from Kenya indicated that instruments used to interfere with the pregnancy included knitting needles, ball-point pens, hangars, and iron rods (3). Similarly, we have found that plastic materials and metallic instruments were responsible for causing uterine perforation in 8/25 and 5/25 cases, respectively. On the other hand, the perforating instruments in the report from US America were dilators in 34%, suction cannulae in 28%, sharp curettes in 25% and uterine sound in 13% (2).

Sites of perforation are also different in different studies. It can be on the anterior or posterior wall, cornual, fundal or cervical portion, or cervico isthmic or broad ligament area (5, 7, 10). In one study the site of perforation reported from 47 patients lateral was in 40%, right lateral in 21%, left lateral was in 17%, posterior in 13% and fundal in 9%. In the same study, most perforations (64%) occurred in the corpus while the remaining 36% occurred in the cervico isthmic region. Another study reported that 16 of 20 (80%) perforations were located in the cervix or lower uterine segment (8). Both studies are conducted where abortion is procured safely in health institutions. In our study where abortion is unsafe the site of perforation was mostly anterior corpus and cervico-isthmic in 11 and 7 of the total 25 cases, respectively.

Associated complications like sepsis, hemorrhage, gut injury, and vesicovaginal fistula are reported (6,7 ,8,10). Bowel injury was reported in three and uncontrollable hemorrhage in six of the total 28 cases following elective termination of pregnancy (7). In another study, bowel injury occurred in two, fever in 10 and hemorrhage severe enough to require blood transfusion in 17 of 66 women who sustained confirmed uterine perforation (8). The complications identified in this study are not different from those described above. In agreement with the general recommended management options (6, 9) total abdominal hysterectomy with or without oophorectomy, evacuation and curettage under direct visualization followed by repair, subtotal hysterectomy, repair of bowl, and colostomy with subsequent closure was

performed in 15, 5, 4, 4, and one case, respectively. Vigilant observation and oral antibiotic therapy can also be one mode of management if the abortion is safe. Freiman (4) et al managed 12 of 28 (43%) cases as such.

The final outcome is different and includes chronic pelvic pain, ectopic pregnancy, infertility, or a maternal mortality. Reports from different areas show that mortality from abortion varies from 1.1 - 6% (2, -4, 10). But, this report show that 8 of 25 (32%) cases of uterine perforations died implying death rate in such cases can increase five to 30 fold. Because of poor follow up rate long term complications could not be described.

In conclusion, uterine perforation is associated with increasing number of complications including death. Physicians catering to health care of women with unsafe abortion shall exhibit a high index of suspicion for uterine perforation.

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