

Availability and Quality of Emergency Obstetric and Newborn Care Service in Dire Dawa, Ethiopia

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Abstract

Background: Emergency and new born care service (EmONC) is a package of medical interventions that treat the direct obstetric complications.

Aim: To assess the availability and quality of emergency obstetric and new born care service in Dire Dawa town health facilities.

Methods: Institution based cross sectional study was carried out on emergency obstetric and new born care (EmONC) service in Dire Dawa town of Eastern Ethiopia. All 15 health facilities were assessed. Data was collected using a standard check list that was adopted from WHO, UNICEF AND UNFPA emergency obstetric monitoring handbook and Engenderhealth emergency obstetric quality improvement assessment tool. The data were cleaned, coded and entered into SPSS version 20 for descriptive analysis.

Results: Out of 5 hospitals and 1 higher private clinic that were expected to offer comprehensive emergency obstetric and new born care (CEmONC) service, 1 was qualified as CEmONC health facility. Out of 9 health centers that are expected to offer basic emergency obstetrics and new born care (BEmONC) service, 1 was qualified as BEmONC facility. Case fatality rate and population based caesarean section rate were 5.3% and 11.4% respectively. The most frequent direct obstetric complication was severe preeclampsia/eclampsia accounting for 36.6% (117/320). It was also the cause of almost one third of maternal deaths (5/17).

Conclusions: BEmONC facility ratio was not adequate while CEmONC facility ratio met the minimum standard. Case fatality rate (CFR) is higher than what is recommended by the UN, which indicates poor quality of EmONC service.

Keywords Emergency obstetric care; Newborn care; Signal functions

Introduction

Maternal mortality is a major health problem, particularly in Sub-Saharan Africa, where half (50.4%) of all maternal deaths worldwide occurs [1]. The reduction of maternal deaths by three-quarters, between 1990 and 2015, is a global concern, articulated as the fifth millennium development goal [2].

The vast majority of maternal deaths are due to direct obstetric complications; haemorrhage, sepsis, complications of abortion, hypertensive disorders of pregnancy, prolonged/obstructed labor, ruptured uterus and ectopic pregnancy [3-5].

The vast majority of maternal deaths are due to direct obstetric complications; haemorrhage, sepsis, complications of abortion, hypertensive disorders of pregnancy, prolonged/obstructed labor, ruptured uterus and ectopic pregnancy [3-5]. The high number of maternal deaths in some areas of the world reflects inequities in access to health services, and highlights the gap between the rich and the poor. Almost all maternal deaths (99%) occur in developing countries.

More than half of these deaths occur in Sub-Saharan Africa and almost one third occur in South Asia [6,7].

The maternal mortality ratio in developing countries is 240 per 100,000 births versus 16 per 100,000 in developed countries [8]. There are large disparities between countries, with few countries having extremely high maternal mortality ratios of 1000 or more per 100,000 live births. There are also large disparities within countries, between people with high and low income and between people living in rural and urban areas [8-10].

Maternal and neonatal mortality can be significantly reduced by improving the availability, accessibility, quality and use of services for the treatment of complications that may arise during pregnancy, childbirth and the postpartum period. These life-saving services are collectively known as emergency obstetric and neonatal care (EmONC). Access to good obstetric care would prevent 50% to 70% of maternal deaths, reduce neonatal mortality by 10% to 15%, and substantially reduce the number of women living with sequel of obstetric complications [11].

Signal functions refer to a set of interventions used to treat direct obstetric complications which were identified by WHO, UNICEF and

UNFPA. These interventions are key components of emergency obstetric and new born care (EmONC) and include administering parenteral antibiotics, administering uterotonic drugs, administering parenteral anticonvulsants for preeclampsia and eclampsia, manual removal of placenta, removal of retained products, performing assisted vaginal delivery and performing basic neonatal resuscitation [11,12].

EmONC facility can be basic or comprehensive facility. If a health facility provided the first seven signal functions in the last three months, it is qualified as basic EmONC (BEmONC) facility. If a health facility performed all nine signal functions in the last three months, it is qualified as a comprehensive EmONC (CEmONC) facility. Maternal and neonatal mortality can be significantly reduced by improving the availability, accessibility, quality and use of services for the treatment of complications that may arise during pregnancy, childbirth and the postpartum period. These life-saving services are collectively known as emergency obstetric and neonatal care (EmONC). The guideline recommends that for every 500,000 people there should be four facilities offering basic and one facility offering comprehensive essential obstetric care [11].

According to the guideline the performance or quality of EmONC service is determined by the proportion of maternal death within EmONC facility at specified period admitted with direct obstetric complication at the same period. This is termed as direct obstetric case fatality rate (CFR). The maximum acceptable level is less than 1% [12].

Maternal Mortality Ratio (MMR) in Ethiopia is estimated to be 676/100,000 (EDHS 2011). The proportion of women attending ANC is 43% with wide variation in Rural (26%) and Urban (66%) respectively and institutional delivery is 10% [13].

Acknowledging the magnitude of the problem, the Government of Ethiopia has taken important strides and is committed to the reduction of maternal mortality. However, the maternal mortality rate is still high and increased compared to EDHS 2005 (673/100,000). It needs more effort to attain the target of MDG by 2015.

In this study area, there is no study found that shows the status of the service. This study will fill the gap by providing the current status of EmONC service in Dire Dawa town. This information is critical for planning purposes, resource allocations, and human resource development (training, deployment and retention) to improve emergency obstetric and new born care service in Dire Dawa town.

Methods and Materials

A cross-sectional design was conducted. Data was collected from record review using a data abstraction tool and interview from health care givers using standardized checklist. The study was undertaken from March/2015 to May/2015. The assessment tool was adopted from a handbook for emergency obstetric care which is prepared by WHO, UNICEF and the Averting Maternal Death and Disability Program (AMDD) published in 2009 and Engenderhealth emergency obstetric quality improvement assessment tool.

The study assessed entire 15 health facilities found in the town. These are 4 private hospitals, 1 governmental hospital, 9 health centres and 1 private higher clinic that provides labor and delivery service. Medical records review was done for direct obstetric complications and maternal deaths admitted in the last 12 months preceding the assessment. All mothers with direct obstetric complications were included according to the WHO standard for analysis of direct obstetric case fatality rate. The collected data were cleaned, coded and

entered into SPSS version 20 database and was analysed. Calculations for number of EmONC facilities per 500,000 and Direct obstetric case fatality rate (CFR) was done as follows:

$$\text{Rate of CEmONC per 500,000 Population} = \frac{\text{Existing CEmONC}}{\text{Total Population}} \times 500,000$$

$$\text{Rate of BEmONC per 500,000 Population} = \frac{\text{Existing BEmONC}}{\text{Total Population}} \times 500,000$$

Population based CS rate =

$$\frac{\text{No of CS done in the last 12 months preceding assessment}}{\text{Expected deliveries in the catchment area with the same period}} \times 100$$

Case Fatality Rate (CFR) =

$$\frac{\text{Total no. of maternal deaths from direct obstetric Complication in the last 12 months preceding assessment}}{\text{Expected deliveries in the catchment area with the same period}} \times 100$$

Results

Availability of EmONC facilities

It was found that 1 hospital was qualified as a CEmONC facility from 6 health facilities which were expected to give CEmONC service. One health center was qualified as BEmONC facility from 9 health centers, which were expected to give BEmONC service. The ratio of CEmONC per 500,000 was 1.8. Similarly, BEmONC per 500,000 was also 1.8.

The least performed signal functions in health centers were administration of parenteral anticonvulsants (3/9), manual removal of placenta (3/9) and assisted vaginal delivery (3/9). But, the most performed signal function was administration of uterotonics (9/9). Among hospitals, performing blood transfusion (2/6) and manual removal of placenta (2/6) were the least performed signal functions while administration of uterotonics (6/6) was the most performed signal function (Table 1).

| Signal functions | Facilities that perform signal functions | | |
|------------------------------|--|---------|-----------------------------------|
| | Health (n=9) | Centres | Hospitals and higher clinic (n=6) |
| Parenteral antibiotics | | 4 | 4 |
| Parenteral uterotonic | | 9 | 6 |
| Parenteral anticonvulsant | | 3 | 3 |
| Manual removal of placenta | | 3 | 2 |
| Removal of retained products | | 5 | 3 |
| Assisted vaginal delivery | | 3 | 5 |
| Neonatal resuscitation | | 5 | 4 |
| Blood transfusion | | NA | 2 |
| Surgery (C/S) | | NA | 4 |

Table 1: Number of health facilities performing signal functions, Dire Dawa, Ethiopia (NA: Not applicable)

It was found that the most common reasons for not performing the signal functions in the last 3 months preceding the assessment were no patient indication (no eligible patients), lack of experience and lack of drugs/equipment's/supplies.

Quality of EmONC in Dire Dawa Town health facilities

During the last 12 months there were 5,725 deliveries at all health facilities. Among these, 4,012 were hospital deliveries. There were 320 mothers with direct obstetric complications recorded at hospitals. The

causes of these complications were found to be severe preeclampsia and eclampsia (36.5%), haemorrhage (20.9%), obstructed labor (19.3%), postpartum sepsis (16.6%), complicated abortion (2.2%), ectopic pregnancy (2.2%) and ruptured uterus (0.9%) (Table 2).

| Direct obstetric complications | Frequency N=320 | % | Maternal outcome | | | |
|--------------------------------|-----------------|------|------------------|-----|----------------|------|
| | | | Recovered | | Died | |
| | | | Frequency N=303 | % | Frequency N=17 | % |
| severe preeclampsia | 80 | 25 | 78 | 26 | 2 | 11.8 |
| Eclampsia | 37 | 11.5 | 34 | 11 | 3 | 17.6 |
| Obstructed labor | 62 | 19.4 | 62 | 20 | 0 | 0 |
| Antepartum haemorrhage | 40 | 12.5 | 38 | 13 | 2 | 11.8 |
| Post-partum haemorrhage | 31 | 9.7 | 29 | 10 | 2 | 11.8 |
| Post-partum sepsis | 52 | 16.2 | 49 | 16 | 3 | 17.6 |
| Complicated abortion | 8 | 2.5 | 5 | 1.7 | 3 | 17.6 |
| Ectopic pregnancy | 7 | 2.1 | 7 | 2.3 | 0 | 0 |
| Ruptured uterus | 3 | 0.9 | 1 | 0.3 | 2 | 11.8 |

Table 2: Distribution of obstetric complications in the hospitals of Dire Dawa, Ethiopia

Out of 117 mothers with severe preeclampsia/eclampsia, 98 (83.7%) were treated with magnesium sulphate and the rest 19 (16.2%) were treated with diazepam. From those treated with magnesium sulphate or diazepam, fewer mothers (30.7%) were continued with the treatment for 24 hours after delivery or termination of pregnancy.

There were 20 maternal deaths during the study period. 85% of them [14-17] were due to direct obstetric complications and 15% [3] were due to indirect causes. The leading cause was severe preeclampsia/eclampsia (29.4%) followed by haemorrhage (23.5%). Case fatality rate (CFR) was 5.3%.

During the study period, there were 1183 caesarean section deliveries. Population based caesarean section rate was 11.4%. Institution based caesarean section rate was calculated to compare the public and private facilities. It was found that there was a major difference between public (28%) and private facilities (27%-51%) caesarean section rate (Figure 1).

There were 1,713 deliveries at health centers from which 208 mothers sustained direct obstetric complications. These complications were preeclampsia/eclampsia (49%), antepartum haemorrhage (27%), obstructed labor (23%) and postpartum sepsis (1%).

28% of mothers with severe preeclampsia/eclampsia were given magnesium sulphate loading dose, but there was no record for 72% of mothers with indication whether magnesium sulphate was given or not.

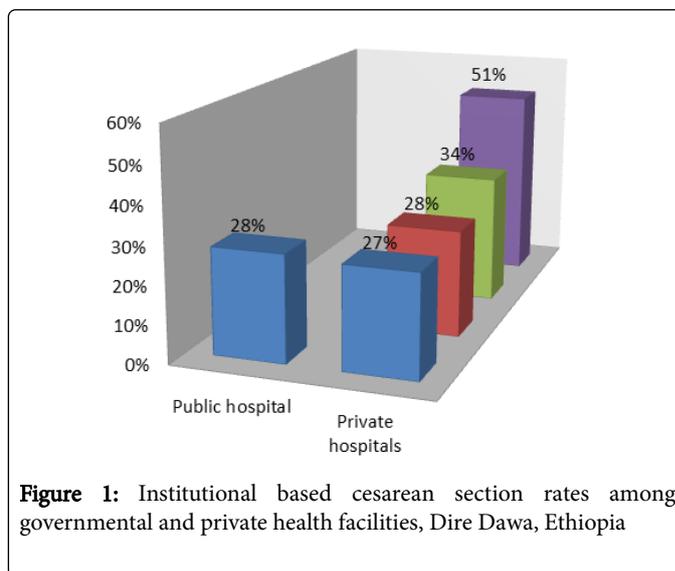


Figure 1: Institutional based cesarean section rates among governmental and private health facilities, Dire Dawa, Ethiopia

Discussion

The minimum recommended level set by UN standards to address emergency obstetric and neonatal problem is 5 EmONC (1 CEmONC and 4 BEmONC) facilities per 500,000 [12]. Based on this standard, there should be a minimum of three EmONC facilities (1 CEmONC and two BEmONC) to Dire Dawa town population. This study revealed the CEmONC facility ratio met the minimum standard, but BEmONC facility is not adequate to the size of the population.

Data from other studies on the availability of EmONC facilities showed a tendency to have an adequate number of CEmONC facilities

in relation to population, but the inadequate number of BEmONC facilities. Studies conducted in Northern Tanzania, which assessed 129 facilities [14] and in Malawi which assessed 73 health facilities [15] found that enough hospitals met the UN standard for CEmONC facility but most health centers didn't meet the standard to be qualified as BEmONC.

In Tanzania out of 111 health centers only 5 health centers were qualified as BEmONC and 14 hospitals out of 18 were qualified as CEmONC. The Federal Ministry of Health Ethiopia also planned the proportion of BEmONC and CEmONC facilities per 500,000 by HSDP III plan [16]. It was planned to scale up 1 BEmONC health center per 25,000 and 1 CEmONC facilities per 100,000 populations [1,17]. With this plan the number of existing EmONC facilities in the study area are far away to the target.

This study revealed that administration of anticonvulsant drugs, performing manual removal of placenta and performing assisted vaginal delivery were the least performed signal functions. This is a similar finding with a study conducted by FMOH on national need assessment of EmONC [18].

In this study the reasons for not performing signal functions were found to be no patient indication, lack of training/experience and lack of drugs/supplies/equipment's for EmONC service. The most common reasons listed in the study of FMOH were lack of supplies/drugs/equipment, lack of human resource and no patient indications [18].

In this study area, the case fatality rate was higher than the UN recommendation which was 5.2%. A Similar result was found in a study conducted African countries. It identified that the CFR in South Sudan was 7% and in Kenya was 5% [19].

This study found that the most frequent complications were severe preeclampsia/eclampsia (36.5%). This is in contrast to a study conducted in Adigrat; Northern part of Ethiopia that showed obstructed labor was the most common complication [20].

In this study, 83.8% of severe preeclampsia and eclampsia were treated with Magnesium Sulphate and 16.2% were treated with Diazepam and for 30.1% of them the treatment was continued 24 hrs after delivery or termination of pregnancy. Similar result was seen in a study conducted in china where treatment was not continued for 24 hrs for all severe preeclampsia and eclampsia mothers treated with magnesium sulphate [21,22].

Conclusion

CEmONC facility ratio met the minimum standard for the population size while BEmONC facility ratio was not adequate. The case fatality rate was higher than UN standard. Severe preeclampsia and eclampsia were the leading cause of maternal death and the most frequent obstetric complications in Dire Dawa town health facilities. The existing health centers should be upgraded to fully functioning BEmONC facilities. It is important for a resource-poor country such as Ethiopia to direct efforts at increasing access to BEmONC facilities and at upgrading existing BEmONC facilities, because many obstetric complications can be resolved at the BEmONC level.

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