REVIEW ARTICLE

Maternal Mortality among Refugees and in Zones of Conflict

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Abstract

Every day, more than 500 women and girls in countries with emergency settings die during pregnancy and childbirth, due to the absence of skilled birth attendants or emergency obstetric procedures and unsafe abortion. Three chronologically ordered delays contribute to the increased maternal morbidity and mortality in conflict zones: (1) delay in recognizing the need to seek obstetrical care, (2) delay in reaching the medical facility, and (3) delay in diagnosing and receiving the proper care. When it comes to the causes of maternal mortality in states of conflict, the trends seem to be concordant with those seen in global estimations. Most common causes are preventable complications that could be avoided if proper care is given in the right time, including obstetrical hemorrhage, hypertensive disorders of pregnancy, and sepsis. Despite the apparent effects of war on interruption of access to reproductive healthcare, its direct consequences on pregnancy outcomes are less clear. Low birth weight, stillbirth, and prematurity were found to be consequences of conflict exposure. According to the World Health Organization, there are multiple evidence-based interventions that have been shown to reduce maternal morbidity and mortality, for which there is moderate- to high-quality evidence.

Keywords: Conflict zones, Maternal mortality, Refugees.

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Introduction

Maternal mortality remains one of the major focuses of the United Nations (UN) agenda. Despite the large failure in reducing its rates by two-thirds by 2015 as part of the millennium development goals, new targets have been set by the UN sustainable development goals to reach a global maternal mortality rate (MMR) of less than 70 maternal deaths per 100,000 live births in 2030.[1] The current trends in MMRs are far behind the anticipated target. In 2017, the global MMR was 211 maternal deaths per 100,000 live births, marking a 38% decrease from the rate in 2000, 342 maternal deaths per 100,000 live births.[1] Discrepancies in maternal mortality are geographically evident, with a point estimate MMR reaching as high as 542 maternal deaths per 100,000 live births in sub-Saharan Africa as opposed to 10 in Europe. The countries with the highest and lowest MMRs are South Sudan and Finland, respectively, with an MMR of 1,150 maternal deaths in 100,000 live births in the former and 3 maternal deaths in 100,000 live births in the latter.[1] Together sub-Saharan African and South Asia account for 86% of total maternal deaths in 2017.[1]

To implement interventions that aim to decrease maternal mortality, the causes of death must be identified and quantified. A World Health Organization systematic analysis stratifies the different cause into seven direct and indirect causes. Most striking are the high levels of preventable direct obstetric causes which account for 73% of total maternal deaths in the survey between 2003 and 2009.[2] Direct causes include obstetric hemorrhage, hypertensive disorders, pregnancy-related sepsis, abortion embolism, and other direct causes such as obstructed labor and complications of delivery.[2] The indirect causes account for 27.5% of all maternal deaths and include medical disorders aggravated by pregnancy, HIV-related deaths, and all other indirect causes.[2]

Maternal Mortality in Zones of Conflict

Countries showing little to no improvement in their MMRs were shown to be those in critical humanitarian settings mainly in conflict and post-conflict situations. The Fragile States Index classified South Sudan, Somalia, Central African Republic, Yemen, Syria, and Sudan as "very high alert" as these countries having MMRs ranging from 31 in Syria to 1,150 in South Sudan in 2017.[1] The number of conflicts worldwide has risen from 41 in 2014 to 50 in 2015.[3] These conflicts include state-based armed conflict, non-state conflict and one-sided violence.[3]

Three Delays that Increase Maternal Morbidity and Mortality

In all settings of currently or previously active violence maternal mortality is largely unhindered. The greatest effect of war and displacement on mothers is that the access to reproductive healthcare is impeded. Thaddeus and Maine developed the three delays model that sets forth a schema through which resource-poor settings such as conflict zones increase maternal mortality and morbidity. The model includes three chronologically ordered delays, the first which is a delay in recognizing the need to seek obstetrical care, the second is a delay in reaching the medical facility, and the third which is a delay in diagnosing and receiving the proper care.[4]

The **first delay** is largely a result of the factors involved in the decision-making process such as the cost of care, status of women in a particular society, and symptoms perceived by the pregnant lady. A study of Kenyan refugee camps revealed that the most common

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avoidable factor associated with maternal deaths in 2 years period was the delay in seeking and receiving care, with the proportion of women who had four or more antenatal care visits being lower among refugee women who had died (33%) than among the general refugee population (79%).[5]

Additionally in Eastern Sudan, most reported incidents of maternal deaths were associated with a delay in seeking care which was highly attributed to the inability of women to take the decision for themselves, rather they had to wait out for their husbands and bear the consequences of the delay of the lost time.[6]

In the Lebanese war in 2006, large populations from the South were displaced. There was a significant drop in seeking antenatal healthcare among the displaced women after displacement and before the onset of war; this was largely due to the misperception that availability of low-cost healthcare systems is restricted.[7]

The **second delay** is a consequence of barriers in reaching healthcare; it is largely determined by the availability of means of transportation, by the location of the healthcare center and the road conditions that lead to it. Rohingya refugee camps have been granted limited lands in Bangladesh for settlement resulting in crowded and congested establishment.[8] Since ambulances and other vehicles have limited access in these packed conditions, pregnant women in labor or in emergency are left with no other option but to walk for long distances or stay at home.[8] In other locations, different obstacles limit the access to healthcare; for Palestinian women, it is the Israeli army checkpoints. It was shown that the fear of being stalled by the checkpoints and not making it to the hospital on time for labor or for resolving an obstetrical emergency, the fate of Palestinian pregnant women is faced with uncertainty.[9]

The **third delay** is due to inadequate service provided at the healthcare. It is a result of faulty or delayed diagnosis, inappropriate interventions, the lack of competent providers, and the shortage of equipment. One of the major factors leading to maternal mortality in Kenyan refugee camps was the failure to assess the severity of gravid women's conditions.[5] Additionally, in these locations, a lack of blood supply for transfusion was a main limiting factor in rescuing mothers facing obstetrical hemorrhage. From another approach, the third delay model was apparent in limiting the proper access to maternal care of gravid women in South Sudan, where in-depth one-on-one interviews were conducted with women and their husbands revealing that the healthcare facilities they had access to had great limitations such as stock-out of medication, lack of staff leading to long waiting times, and lack of beds and seats.[10]

War and conflicts have long-term implications on maternal mortality as well. Stressful times lead to an increased need for feelings of security; in some cultures, this implies having children.[11] This is one way by which war increases fertility and a possible eventual rise in maternal mortality. However, war impose a state of violence and chaos, thereby increasing the rates of gender-based violence leading to unwanted pregnancies, the referral to unsafe abortions, and eventual increase in maternal mortality.[11]

Causes of Maternal Mortality in States of Conflict

When it comes to the causes of maternal mortality in states of conflict, the trends seem to be concordant with those seen in global estimations. Most common causes are preventable complications that could be avoided if proper care is given in the right time. Hynes et al. demonstrate that the most common preventable cause of maternal mortality in a total of 25 refugee camps in 10 countries is obstetrical hemorrhage (33%), hypertensive disorders of pregnancy (27%), sepsis (13%), and others.[5] Indirect causes which include previously diagnosed morbidities that become aggravated by pregnancy and its physiological changes also contribute largely (34%) to maternal mortality in these settings.

Similar trends were found in the Gaza strip between 2014 and 2015, where preventable causes dominated; however, infections were more prevalent than postpartum hemorrhage.[12]

Maternal Care in Zones and at Times of Conflict

The Minimum Initial Service Package (MISP) developed by the Women's Refugee commission is a coordinated set of activities to promote reproductive health of women and adolescent girls in settings of crises notably the internally displaced and refugees.[13] One of its main goals is to prevent excess maternal and newborn morbidity and mortality by ensuring the availability of emergency obstetric and newborn care services, in addition to distributing clean delivery kits and ensuring the awareness of the community of these available services. Krause et al. evaluated the implementation of the MISP in Zaatari camp and Irbid city for Syrian refugees in Jordan. They stated a deteriorating service in the camps healthcare facilities as reported by the patients, due to lack of drugs and proper services accomplished by unqualified providers. Additionally, a reluctance in seeking care by the women in the camp was noted despite free services because of a lack of privacy and female providers.[14]

According to the International Federation of Gynecology and Obstetrics, the number and competencies of staff is critical in the provision of safe and women-centered care.[15] Staff making up the healthcare providing team must include a mixture of physician and nonphysician personnel such as midwives, nurse, surgical technicians, and medical officers. In a birthing center with no surgical services with up to approximately 1,000 births per year, the minimum recommended number for skilled health personnel is 2 per shift of 24 hours.[15] The number of labor beds in that facility would be 3 and the number of individual delivery rooms would be 2.[15] In an interview-based study conducted in post-conflict Burundi and Northern Uganda, Chi et al. described the barriers in the delivery of obstetric and neonatal care in these countries. The two main reasons for the deplorable state of emergency obstetric and neonatal care services during conflict were the lack of basic equipment and medications and breakdown of the referral system due to insecurity and road blocking.[16] In post-conflict time, these services are still beyond optimal, mainly because of human resource-related challenges such as having 2 nurses responsible for 60 patients a day, and systemic and institutional services whereby essential supplies and medications are lacking.[16]

Adverse Effects of War on Pregnancy Outcomes

Despite the apparent effects of war on interruption of access to reproductive healthcare, its direct consequences on pregnancy outcomes are less clear. The stressors of ongoing conflict and displacement on gravid women seem to inflict adverse effects on birth outcomes. Prenatal stress has detrimental effects on both obstetric outcomes, fetal development, and the development of an individual later in life. A recently published systematic review examined the impacts of exposure to armed conflicts on the pregnancy outcomes since 1990. A total of 13 studies were included in the final analysis, involving data on 1,172,151 mothers from Libya, Bosnia, Herzegovina, Israel, Palestine, Kosovo, Yugoslavia, Nepal, Somalia, Iraq, Kuwait, and Afghanistan.[17] Low birth weight was highly associated with exposure to armed conflict, a finding that

was significant in settings pre- and postwar eruption, in pregnancies where mothers where exposed to chemicals, and in relation to the intensity conflict with respect to maternal residence.[17] Given that mothers exposed to armed conflict are at higher risk of giving birth to babies of low birth weight, obstetric care providers should increase the frequency of ultrasound scans to identify fetal growth restriction and be prepared to intervene regarding the timing of delivery. An increase in the incidence of miscarriage, stillbirth, prematurity, congenital abnormalities, and premature rupture of membranes were also found to be the consequences of conflict exposure.[17] Uterine rupture was one important finding noted in a conflict setting of Hajjah, Yemen. During a 2-year study period (September 2014–August 2016), there were 110 cases of ruptured uterus and 3,457 deliveries (31.8 per 1,000 deliveries), with two thirds of cases happening in an unscarred uterus. In this study, obstructed labor was the most common cause of ruptured uterus in 53.6% of the cases. Uterine rupture contributed to 14.2% of maternal deaths in Yemen).[18]

Conclusion

The alarming increase in zones of conflicts worldwide over the last decade has contributed to an increase in both maternal morbidity and mortality. It has created a new population, the "forgotten victims of war" that the civilized world has totally forgot about them. These conflicts include state-based armed conflict, non-state conflict, and one-sided violence. Delays in seeking and receiving care can result in women with complicated cases reaching healthcare facilities in critical conditions, thus lessening their chances for positive outcomes. Access to emergency transport can be challenging in many refugee camps. Uniform, evidence-based protocols for emergency transport of critically ill patients have reduced mortality in some contexts. To reduce maternal mortality in zones of conflict, overcoming transportation problems to primary healthcare facilities for pregnancy care and improving provision of emergency obstetric services in all hospitals is mandatory. Armed conflicts may contribute to sustained high fertility through increased social insecurity, loss of reproductive health services, and lower female education. In this respect, improving non-health sector factors such as poverty and female education is important.

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