Still-births: Status, causes and interventions based on evidence, thus far

Neeru Gupta[1], Kunal Chatterjee[2]

Abstract

A total of 7,300 women experience still-births globally each day. Different countries have different cut-off for still-births.WHO, in simple terms, defines still-births as a baby born with no signs of life at or after 28 weeks' gestation for international comparisons. A significant chunk of mortality in the form of foetal deaths or stillbirths is missing and not counted in the Millennium Development Goals, nor monitored by the UN, nor given any heed to in the Global Burden of Disease measurements. Nearly one-fourth of all stillborn babies worldwide are from India, the highest for any nation, and more than half of them could be saved by better maternal and obstetric care. Stillbirths have declined by only 15% since 1995. Most of still-births are intrapartum and probably due to inadequate care. In addition to prolonged and obstructed labour, untreated infections such as syphilis are an important cause of stillbirths in low resource settings. Optimal quality of care around childbirth and in the neonatal period could avert thousands of maternal deaths, stillbirths, and newborn deaths in the coming future. In high income countries, overweight, obesity, cigarette smoking and advancing maternal age are three chief causes of stillbirths that are preventable as well.

Despite a global increase in coverage of skilled birth attendance and institutional deliveries, associated declines in maternal mortality have been modest, and for stillbirths virtually non-existent. High quality healthcare should be planned and provided, which includes safety, effectiveness, timeliness, efficiency, equitablity, focussing on people's need and their respect. Research is needed to evolve ways to record still-births and their causes at facility based or community based system of recording and thence getting the data on stillbirths for planning, monitoring and feedback to tackle this worldwide problem.

Keywords: Still-births, Causes, strategies, status, interventions.

Introduction

To live is the basic human right, but millions of babies fail to see the light of day or they die unborn. Motherhood is a blessing. Once a woman becomes pregnant, she and her family waits to welcome the new addition to their family. Death of a baby is not only violation of the baby's right to live but also a major mental trauma to mother and the whole family. According to WHO, any foetal deaths with >= 1000 g birthweight or >= 28 weeks of gestation or crown heel length of >35 cms, is still birth though different countries have different cut-offs. To put it simply, the definition recommended by WHO for international comparisons is a baby born with no signs of life at or after 28 weeks' gestation [1]. However, stillbirths are not included in the international measurements of mortality and morbidity [2]. A significant chunk of mortality in the form of foetal deaths or stillbirths is missing and not counted in the Millennium Development Goals, nor monitored by the UN, nor paid any heed to in the Global Burden of Disease measurements [3]. Similarly, in the current draft of the United Nations sustainable development goals, that sets targets for 2015-30 for the world on the whole, stillbirth is not mentioned, even though neonatal and under 5 mortality rates are included [4]. Zeshan Qureshi and colleagues emphasize that stillbirth should be given more importance and placed higher on the global health agenda [2]. Moreover, stillbirths, as a component of Perinatal mortality (stillborns and mortality in first 7 days of life) is a useful parameter of maternal and child care services. Here, in this review, we present the status, risk factors and causes and interventions as suggested by evidence available till now.

Situation

The global rate of stillbirths was estimated to be 18.9 per 1000 births in 2009, coming to a total of 2.64 million stillbirths (with an uncertainty range of 2.08 million to 3.79 million), 1.2 million of which were during labour (intrapartum) [3,5,6]. The burden is highest for women in low and middle income countries (98% of stillbirths) and among the most poor women in high income countries [6]. Thus, occurrence of still births is related to socio-economic status and development which means that stillbirths are largely preventable. In 2009, 76•2% (three-fourths of stillbirths occurred in

[1]Division of Reproductive Biology and Maternal Health, Indian Council of Medical Research, Ansari Nagar, New Delhi-110029.
[2]Deptt. Of Community Medicine, Armed Forces Medical College, Pune.

Address of Correspondence
Dr. Neeru Gupta
Division of Reproductive Biology and Maternal Health, Indian Council of Medical Research, Ansari Nagar, New Delhi-110029.
Email: neerujani@gmail.com

south Asia and sub-Saharan Africa [3]. This corresponds to a similar distribution of maternal deaths and coincides well with areas of low-skilled birth attendants. The stillbirth rate in sub-Saharan Africa is approximately 10 times that of developed countries (29 vs. 3 per 1000 births) [1]. Ten countries (India, Pakistan, Nigeria, China, Bangladesh, Democratic Republic of the Congo, Ethiopia, Indonesia, Tanzania, and Afghanistan), which account for 54% of total global births, contributed to 67% of all stillbirths (1•76 million) [3]. Nearly one-fourth of all stillborn babies worldwide are from India, the highest for any nation, and more than half of them could be saved by better maternal and obstetric care. Still birth rate was estimated as 20 per 1,000 births (95% CI 15.6-24.5) in Bihar which is population-based data showing a significant burden of still births in Bihar and suggests that addressing stillbirths must become an important part of maternal and child health initiatives [7].

Trends

Worldwide, the number of stillbirths have declined from 1995 to 2009 [3]. The estimated number of global stillbirths was 2•64 million (uncertainty range 2•14 million to 3•82 million) in 2009 compared with 3•03 million (uncertainty range 2•37 million to 4•19 million) in 1995. Thus, worldwide stillbirth rate has declined by 14•5%, from 22•1 stillbirths per 1000 births in 1995 to 18•9 stillbirths per 1000 births in 2009 [2]. India's stillborn rates remained constant through this period, while the most remarkable decrease were registered in China, Colombia and Mexico.3 The same group of authors, in a more recent paper (published in 2016 in Lancet Global Health), found an estimated average global SBR in 2015 was 18•4 per 1000 births, down from 24•7 in 2000 (25•5% reduction). In 2015, an estimated 2•6 million (uncertainty range 2•4-3•0 million) babies were stillborn, giving a 19% decline in numbers since 2000 and negligible decline from 2009 [8]. Similarly, another recen report from WHO reveals the number of stillbirths has declined by 19.4% between 2000 and 2015, representing an annual rate of reduction (ARR) of 2%. This reduction noted for stillbirths is lower than that for maternal mortality ratio (AAR=3.0 %) and

under 5 mortality rate (ARR= 3.9 %), for the same time period [1].

Risk factor and Course of stillbirth

An estimated 2.6 million stillbirths occurred globally in 2009, of which 40% were intrapartum and probably due to inadequate care [3,5]. In addition to prolonged and obstructed labour, untreated infections such as syphilis, malaria are an important cause of stillbirths in low resource settings [3]. According to Lawn et al [3] worldwide, 67% of stillbirths occur in rural families with 55% in rural sub-Saharan Africa and south Asia, where skilled birth attendance and caesarean sections are much lower than that for births occurring in urban areas. In all, an estimated 1.19 million (ranging from 0.82 million to 1.97 million) stillbirths occur during labor in a year, globally. Most intrapartum stillbirths are associated with obstetric emergencies like obstructed labor, whereas antepartum stillbirths are associated with maternal infections and fetal growth restriction [3]. NRHM is a novel initiative by the Government of India to provide health care to people living in the rural areas of relatively poorer states of India. Post NRHM there have been a significant rise in hospital deliveries in rural areas [9]. It was expected and anticipated that the rise in the institutional deliveries will lead to decline in perinatal mortality (inclusive of still-births) because of decrease in intrapartum deaths due to essential and/or emergency care during delivery as evidenced in various studies.10,11 By contrast, Singh et al did not find significant association between the rise in hospital deliveries and corresponding reduction in perinatal mortality (PNMR) [9]. Though deliveries in hospitals have increased but quality of delivery care given may not be optimum. Under NRHM the emphasis was laid on 'universal institutionalised deliveries' instead of 'improved maternal/neonatal health' [9]. A United Nations'report has emphasized that India is not training a sufficient number of skilled birth attendants [12]. According to an analysis of hospital deliveries, viz-a-viz perinatal mortality (inclusive of still-births) in India, District Level Household and Facility Survey 2007-08 has revealed substantial lacunae in availability of qualified service providers, infrastructure, equipment and other supplies in primary and secondary level

health care facilities in India [13]. All health professionals who attend the mother during child birth should be skilled at resuscitation and know how to recognize babies at risk [9]. One review confirmedly concluded that a dose-response effect of maternal smoking in pregnancy exists as a risk of stillbirth. According to the author, in order to minimise the risk of stillbirth, reducing current smoking prevalence in pregnancy should continue to be a key public health high priority [14]. In another systematic review and meta-analysis published in the BMJ, it was found that the risk of stillbirth in subsequent pregnancies is higher in women who had experienced a stillbirth in their first pregnancy. However, the evidence surrounding the recurrence risk of unexplained stillbirth still remained unclear [15]. Another Systematic review found Group B Streptococcus causes up to 12.1% of stillbirths, but it emphasized more research is needed [16]. Most studies reported data from high-income countries and from before the year 2000. Authors also concluded that standardised stillbirth definitions and diagnostic methods are needed to correctly estimate the occurrence of stillbirths to assess the effect of any antenatal interventions [16]. In high income countries, overweight, obesity, cigarette smoking and advancing maternal age are three chief causes of stillbirths that are preventable as well [17]. Identification of methods to reduce maternal obesity is a foremost priority for high-income countries [17]. According to WHO [1], the major causes of stillbirth include: (1) child birth complications, (2) post-term pregnancy, (3) maternal infections in pregnancy (malaria, syphilis and HIV) (4) maternal disorders (especially hypertension, obesity and diabetes) (6) fetal growth restriction (7) congenital abnormalities. Almost half of stillbirths happen during labour.1 The majority of stillbirths are preventable, evidenced by the regional variation across the world. The rates correlate with access to maternal healthcare. The every newborn action plan (ENAP) to end preventable deaths has a set stillbirth target of 12 per 1000 births or less by 2030. Global ARR needs to more than double the present ARR of 2% to accomplish this target for reduction in stillbirth [1].

Interventions to reduce the stillbirths:

Although we need a qualified obstetrician to oversee the entire pregnancy (Antenatal care) and labor (Intrapartal care), but certain selected interventions have been underscored based on current evidence for reducing occurrence of stillbirths. Conde-Agudelo et al after a meta-analysis concluded that there is no clinically useful first-trimester or second-trimester test to predict stillbirth as a sole category, in the current scenario, although they found that Uterine artery pulsatility index and maternal serum PAPP-A levels appeared to be good predictors of stillbirth related to placental dysfunction disorders [18].

Another systematic review also reported that abnormal uterine artery Doppler indices are associated with a three- to four-fold increase in the risk of stillbirth [19]. Interventions with proven benefit in reducing stillbirths [20]: (1) Syphilis screening and treatment (2) Use of insecticide-treated bedmnets in malaria endemic areas during pregnancy (3) Administration of heparin for certain maternal conditions including auto-immune and clotting disorders (4) Emergency obstetric care (5) Planned caesarean section for breech delivery

Interventions with some evidence of impact [20]: (1) Multiple micronutrient supplementation during pregnancy (2) Balanced protein-energy supplementation during pregnancy (3) Management of intrahepatic cholestasis during pregnancy (4) Anti-helmenthic treatment (5) Anti malarials in malaria-endemic areas (6) Fetal movement counting for high risk pregnancies (7) Umbilical artery Doppler velocimetry for high risk pregnancies (8) Intapartum cardiotocography with or without pulse oximetry (9) Elective induction of labour in post-term pregnancy

Reasons of inaccuracy or difficulty recording still births by verbal autopsies

Household surveys such as the Demographic and Health Surveys also report stillbirths, but the quality of data has been questioned due to recall bias, the difficulty of distinguishing between stillbirths and early neonatal deaths, and sensitivities around oral autopsies [2]. In India, according to field experience of two researchers: stillbirths, on oral autopsies, are by contrast over-reported compared to neonatal deaths because of expensive last rites which are required for newborn deaths

compared to stillborns. Moreover, female foeticide is reported as miscarriage, thus making stillbirths under-reported. Female foeticides are done clandestinely, in hiding because of fear of legal penalization [21]. National estimates of causes of stillbirths are very few. Multiple (>35) classification systems are an impediment to international comparisons. Lawn et al suggested that immediate data improvements are feasible through household surveys and facility audit, and improvements in vital registration, including specific perinatal certificates and revised International Classification of Disease codes, are needed. 3 A simple, programme-relevant stillbirth classification that can be used with verbal autopsy would provide a basis for comparable national estimates [4]. A novice focus on all deaths around the time of birth (perinatal mortality) is crucial to give a feedback to programmatic interventions [3]. A systematic review by Leisher et al (published in two parts) concluded that there is a plethora of classification systems. And it attempted to develop a globally acceptable approach for the accurate determination of causes of death, which will be useful not only for comparability and determining the right interventions for researchers and practitioners, but also to tell the bereaved families who want to know "what happened" to their babies [22,23].

Conclusion

Despite remarkable achievements to improve maternal and child survival, 800 women and 7700 newborns still die each day from complications during pregnancy, childbirth, and in the postnatal period; an additional 7300 women experience a stillbirth [5,24-26]. Given the dimensions of stillbirths (though varying from 2.0 per 1000 total births in Finland to more than 40 per 1000 total births in Nigeria and Pakistan3), their prevention should be placed, as aforesaid, high on the global health agenda, more so in countries with higher rates. Stillbirths have declined by only 15% since 1995. As aforesaid, an estimated 2.6 million stillbirths occurred globally in 2009, of which 40% were intrapartum and probably due to inadequate care[5, 27]. In addition to prolonged and obstructed labour, untreated infections such as syphilis are an important cause of stillbirths in low resource settings [4]. Optimal quality of care around childbirth

and in the neonatal period could avert 113000 maternal deaths, 531000 stillbirths, and 1.3 million newborn deaths by 2020 [28]. In high income countries, overweight, obesity, cigarette smoking and advancing maternal age are three chief causes of stillbirths that are preventable as well. Despite a global increase in coverage of skilled birth attendance, associated declines in maternal mortality have been modest, and for stillbirths virtually non-existent [5,25,29,30]. As stated by Chou et al: This lack of improvement highlights the need to focus on quality of care, including provider competencies and environments that enable provision of essential clinical interventions with dignity [24]. High quality healthcare that includes safety, effectiveness, timeliness, efficiency, equitablity, focussing on people's need, and respect [31]. Research is needed to evolve ways to record still-births and their causes at facility based or community based system of recording and thence getting the data on stillbirths for planning, monitoring and feedback to tackle this worldwide problem. The India Newborn Action Plan (INAP) is an India's initiative started on the heels of the Global Every Newborn Action Plan (ENAP) (launched in June 2014 at the 67th World Health Assembly). It involves specific actions to impact stillbirths and newborn health with a long-term goal of ending preventable deaths among women and children [32].

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