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Analysis of maternal deaths at a sub urban tertiary care Hospital in South India: A desirable downtrend

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Abstract
Background: Maternal mortality ratio is the key indicator to measure the effectiveness of health care system, particularly status of women in society. Analysis of causes of maternal deaths helps to identify pitfalls to accelerate further decline in MMR.
Objective: To analyse the trends and causes of maternal deaths for five year period at tertiary care hospital and develop strategies towards zero preventable maternal deaths.
Method: Retrospective study of 61 maternal deaths for 5 years from 2014 to 2018.
Results: The Maternal mortality ratio shows a decreasing trend from 177 to 67 at our hospital. Direct causes account for 70.5% and indirect causes account for 29.5% of maternal deaths. Hypertensive disorders (28.5%) and Post partum haemorrhage (24.5%) are the leading direct causes for maternal deaths.
Conclusion: Highly specialized intensive care and skilled ICU trained nurses for monitoring will make zero preventable deaths a reality.

Keywords: Maternal mortality, direct obstetric death, preeclampsia, post-partum haemorrhage

Introduction
Maternal mortality rate (MMR) is on the decline in India due to various health care initiatives. Currently MMR is 190/100000 live births [1]. The target is to reduce the global MMR to less than 70 by 2030 according to sustainable developmental goals [2]. Tamil Nadu has achieved a MMR of 66 and has shown remarkable progress [1]. It is 10 times higher than Canada and developed European countries. Zero preventable maternal deaths is our next goal. Maternal mortality ratio is number of maternal deaths per 100000 live births during a given period. Direct causes of maternal death is the result of complication of pregnancy, delivery and management. Indirect causes are those pregnancy related causes that are pre existent or a newly developed health condition. Maternal mortality ratio is the key indicator to measure the effectiveness of health care system, particularly status of women in society and overall health of a population. Tamil Nadu has excellent health care infrastructure and with the state NRHM providing much needed support, SDG goals 2030 has already been achieved and marching towards zero preventable death due to PIH in coming years.

Material and Methods
The present study is a retrospective study conducted at Department of Obstetrics &Gynecology at Chengalpattu medical college which is a tertiary care hospital in suburban Tamil Nadu. Maternal deaths during five year period from January 2014 to December 2018 were analysed. Data of demographic profile, parity, admission to death interval and causes of death were analysed as percentages and proportions.

Results

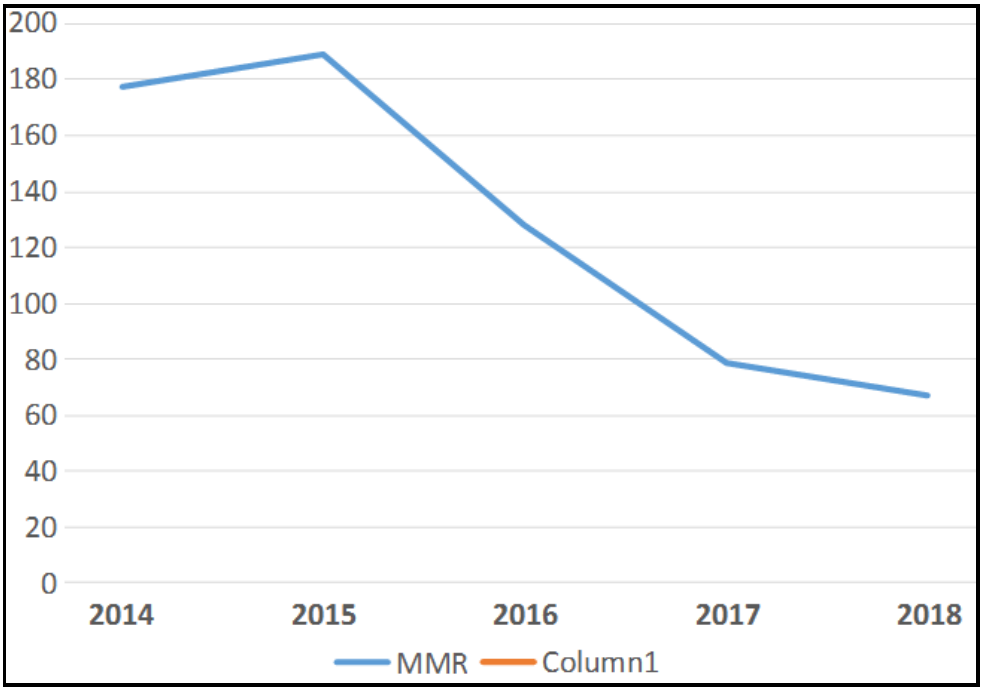

Fig 1: The Maternal mortality ratio shows a decreasing trend from 177 in 2014 to 67 at year 2018

Table 1: Year wise distribution of deliveries and maternal deaths

Year	Live Birth	Maternal Deaths	MMR
2014	8434	15	178
2015	9518	18	189
2016	10142	13	128
2017	10125	8	79
2018	10433	7	67

Table 2: Distribution of maternal deaths according to sociodemographic characteristics

Sociodemographic characteristics	Number of maternal deaths	Percentage of maternal deaths
AGE		
<19 Yrs	2	3.2%
19-24 Yrs	31	50.8%
25-29 Yrs	18	29.5%
30-34 Yrs	8	13.1%
≥35 Yrs	2	3.2%
Area Of Residence		
Urban	11	18%
Rural	50	82%
Education		
Illiterate	3	4.9%
Primary School	15	24.5%
High School	33	54.1%
Graduate	10	16.3%
Gravida		
1	33	54.1
2	13	21.3
3	9	14.7
4	4	6.5
≥ 5	2	3.2

Table 3: Causes of maternal deaths

Direct Causes	N=43	70.5%
Antepartum Haemorrhage	4	6.5%
Post Partum Haemorrhage	15	24.5%
Severe Preeclampsia	4	6.5%
Eclampsia	8	13%
Help Syndrome	4	6.5%
Pulmonary Embolism	2	3..2%
Amniotic Fluid Embolism	3	5.0%
Thromboembolism	2	3.2%
Hyperemesis	1	1.6%
Indirect Causes	N=18	29.5%
Anemia		
Heart Disease	4	6.5%
Cardiomyopathy	3	5.0%
Tuberculosis	1	1.6%
ARDS	1	1.6%
Sepsis	1	1.6%
Others	3	5.0%

Table 4: Timing of maternal death since admission and hospital stay

Time Interval	No. of Deaths	Percentage
0-1 hr	5	8%
2-12 hrs	12	20%
13-24 hrs	10	15.5%
25-165 hrs	18	31%
7days and above	16	26.5%

Table 5: Year wise distribution of direst causes of maternal deaths

Year	Antepartum haemorrhage	Post-partum haemorrhage	Toxemias	Pulmonary emboli	Amniotic fluid emboli	CVT	Hyper Emesis
2014	0	4	8	0	0	0	0
2015	2	5	4	1	0	1	1
2016	1	3	1	0	2	1	0
2017	1	1	2	1	1	0	0
2018	0	2	1	0	0	0	0

The Maternal mortality ratio shows a decreasing trend from 177 in 2014 to 67 at year 2018 (Fig-1) (Table 1). There were 48.652 live births during study period and 61 maternal deaths. Maternal deaths declined from 15 deaths in year 2014 to 7 deaths in year 2018 though the deliveries have increased from 8434 in 2014 to 10433 deliveries in 2018(Table 1). The overall MMR for study period is 125. Maximum of 50.8% of maternal deaths occurred in 19-24 yrs. 19-24 Yrs primigravida from rural areas account for >50% of all maternal deaths.16, 5% of maternal deaths occurred among graduates (Table- 2). Direct causes account for 70.5% and indirect causes account for 29.5% of maternal deaths. PIH (toxemias) and Post partum haemorrhage are the leading direct causes for maternal deaths and account for 28.5% and 24.5% of all maternal deaths respectively. Among indirect causes of maternal deaths Anemia contributes to 8.1% of maternal deaths. Deaths due to sepsis has reduced and accounts for 1.6% of deaths. With declining MMR, indirect causes of maternal deaths account for 50% of maternal deaths in last 2 years (Table- 3). The admission to death interval in 58% is more than 24 hrs at ICU. Hence improving intensive care facilities and critical care specialists at ICU will help in better survival (Table-4). Direct obstetric deaths due to preeclapsia /eclampsia and post partum haemorrhage has been reduced between 2014-2018 which is the major contributor to decline in MMR in last two years (Table- 5).

Discussion

Reduction of maternal mortality is the main objective of SDG goals[2] which aims to bring the world wide MMR to less than 70 by 2030. In our present study the MMR was 125 (past 5 yrs), but drastic decline trend[3] noticed in past 2 years. In 2017 MMR was 79 and further reduced to 67 in 2018.This is mainly attributed to improvement in rate of timely referrals. Strict adherence to management protocols of high risk deliveries, early and timely management of all referral cases and periodic review of deaths at all levels and ensuring better accountability. 43.5% of patients died within 24 hrs of admission. The admission to death interval in 56% percent is more than 24 hrs at ICU. Hence improving intensive care facilities and critical care specialists at ICU will help in better survival. All delivery points has to be further strengthened with availability of Emonc trained medical officers. Direct obstetric causes of death due to PIH and PPH has been reduced due to adequate availability of all blood components and AMTSL protocols being followed, which is the major contributor for the decline in MMR. State NHM has kept STOP PIH MORTALITY as an interim goal for the year 2018-2019 and all field workers and obstetricians are working towards the goal. Although the absolute number of women dying due to hypertensive disorders and PIH has decreased, still they account for 40-50% of total maternal deaths in past 2 years. With declining MMR, indirect causes of maternal deaths account for 50% of maternal deaths in last 2 years [4, 5] and hence increasing importance to address these factors will further reduce MMR. Availability of ECHO screening for all antenatal mothers antenatally and postpartum, availability of super-specialities in cases which require such multidisciplinary care, exclusive dedicated staff nurses for obstetric ICU and labour ward and ventilator care technicians round the clock in ICU will further strengthen the system

A comparative analysis of maternal death

Table 6: A comparative analysis of maternal death

Studies	MMR	Haemorrhage	Hypertensive Disorders in pregnancy	sepsis	Anemia
Goswami KD *et al.* [6]	219	50%	13%	11%	33%
Yadhav *et al.* [7] (2006 -2009)	555	32.0%	24.2%	7.2%	14.9%
Vidhyadhar *et al.* [8] (2006-2010)	302.6	21%	10.5%	7.8%	2.6%
Bhaskar k murthy *et al.* [9] (2001-2010)	302	26.6%	26.6%	18.3%	10%
Abhilasha nair *et al.* [10] (2014-2015)	410	33.8%	10.3%	8.1%	14.7%
Verma Ashok *et al.* [11] (1996-2006)	345.9	21.8%	20%	21.6%	15.4%
Raja rajeswari *et al.* [12] (2014-15)	204	31%	40%	3.2%	17.2%
Present study (2014-18)	125	24.5%	26%	1.6%	8.1%

Our study when compared with other Indian studies on MMR reveals a lower MMR as most studies reported from rural tertiary care centres unlike ours which is a semi urban centre and better road &ambulance transport facilities in our state and better access to all levels of heath care facilities. The two leading causes of maternal mortality in all studies were PPH and PIH which requires timely diagnosis and management. In our present study 33 deaths, (54%) occurred in primigravidas, which is slightly higher than studies by Vidhyadhar *et al.* [8] (42%) and Rajarajeswari *et al.* [12] (31%). In our study (50.5%) of women died in age group of 19-24 yrs and (29.5%) in age group of 25-29 yrs which account for 80% of maternal deaths. This is comparable to observations by Verma Ashok *et al.* [12] (78.5%) & Arpita *et al.* [13]. The MMR at our institution is less when compared to other tertiary care care hospitals of other states because of better functioning of our referral system and every maternal death and near misses are analysed and audited at multiple levels thus ensuring better accountability from care givers. To further reduce MMR and to sustain this downtrend requires periodic analysis of all near miss cases using WHO near miss criteria [14].

Conclusion

The analysis of our maternal deaths periodically helps to formulate new strategies unique to each institution and prevent future maternal deaths. As institutional deliveries are nearing 100% and timely referral being done, strengthening our tertiary care facilities with highly specialized intensive care and monitoring with critical care specialists will make zero preventable deaths a reality.

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Ethical approval: The study was approved by the Institutional Ethics Committee

Reference

1. SRS-special bulletin on maternal mortality in India, 2014-2016
2. Sustainable developmental goals-UNDP-2030 Agenda;

transforming our world
3. WHO analysis of causes of maternal death, a systematic review-Khan KS *et al.* Lancet. 2006; 367:1066-107443.
4. Indirect causes of maternal death frederikke storm *et al*., the lancet global health. 2014; 2(10):566.
5. Indirect maternal deaths: UK and global perspectives-Manisha nair, Catherine nelson-piercy Obstet Med. 2017; 10(1):10-15
6. Goswami KD *et al*. An analytical study of maternal death at tertiary care hospital. Int. J Med Res Rev. 2015; 3(9):1008-1011
7. Yadav K, Namdeo Bhargava M. A retrospective and prospective study of maternal mortality in a rural tertiary care hospital of central India-India journal of community health, 2013, 25(1).
8. Vidhyadhar B, Purushottam A *et al*, Maternal mortality at a tertiary care teaching hospital of rural India, a retrospective study, Int journal Biol med Res. 2011; 2(401043-46.
9. Bhaskar K *et al*. 10 year review of maternal mortality at a tertiary care hospital in central India Int. J Prev Med. 2013; 4(1):105-109. Indian J Community Med. 2011; 36(3):213-2161.
10. Study of maternal mortality in a tertiary care hospital in a district of Maharashtra Abhilasha Nair, Mohan K Doibale, Venkatesh V Gujrathi, Ismail F Inamdar, Amol D Shingare, Pinkesh S Rajput -International journal of medical science and public health, 2018
11. Verma Ashok, Minhas Santosh, Sood Anupa. A study of Maternal mortality. J Obstetric Gynaecol India. 2008; 58:226-229.
12. Rajarajeswari R *et al*. Int J Reprod Contracept Obstet Gynecol. 2016; 5(11):3864-3870.
13. Arpita N. A retrospective and prospective study of maternal mortality in a rural tertiary care hospital of central India. Indian journal of of community health. 2013; 25:1.
14. Pattison R, say L, Souza JP. WHO maternal death and near miss classifications. Bull world health organization. 2009; 87:734.