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Original Research Article

## Analysis of still births in a tertiary care system and changed scenario over six year period

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### ABSTRACT

**Background:** In India, the maternal and infant mortality rates have been steadily decreasing in recent years, but there has been no corresponding decrease in the perinatal mortality. Hence, there is need to evaluate the factors leading to this unfortunate event. The objective of this study was to find out various factors (especially preventable) responsible for perinatal stillbirths.

**Methods:** An analytical comparative study in a tertiary care hospital comparing fresh and macerated still births over a period of one year in 2011 and 2017 and responsible factors were analysed.

**Results:** Amazingly, despite improvement in the antenatal services, more institutional deliveries, there is no change in the incidence of still birth rate. However, there was decrease in the rate of still births due to extreme prematurity and congenital malformations. There was no change in incidence of PIH/ Eclampsia, IUGR and placental causes but there was substantial increase in the incidence of GDM.

**Conclusions:** Perinatal mortality can definitely be reduced by strengthening and improving quality of antenatal services, early identification of high risk pregnancies, timely referral and appropriate intervention.

**Keywords:** Eclampsia, IUGR, Prematurity, PIH, Still birth

### INTRODUCTION

Still birth is an event which has always challenged the obstetrician. The definition of still birth differs in the developed and developing countries, depending upon the potential of the neonatal intensive care unit. For International comparison, WHO defines still birth as a baby born with no signs of life at or after 28 weeks of gestation or the weight is >1000gms (POG unknown). The perinatal mortality serves as the most sensitive index of maternal and neonatal care and reflects the general health and socio-biological features of the population of that area. In India, the maternal and infant mortality rates

have been steadily declining in the recent years but there has been no corresponding reduction in the perinatal mortality. It has been shown that the pathological processes resulting in late foetal deaths and neonatal deaths are similar. The high incidence of perinatal deaths in our country warrants urgent appraisal of factors responsible for it as most of the causes are preventable, provided timely intervention is done.

### METHODS

This analytical comparative study was conducted in KNSH for M and C which is a tertiary care hospital and

provides first contact care to local population and surrounding areas as well as a referral centre for whole of the state. All subjects who had still births with effect from 1<sup>st</sup> January 2017 till 31<sup>st</sup> December 2017 were included in the study and studied prospectively and all subjects who had still births over a similar period of one year in 2011 were studied retrospectively from the records. Both were studied for maternal details and antepartum, intrapartum and postpartum details were noted on a preformed proforma. All the details were tabulated, compared and analysed in percentage to find out various causes responsible for still births and whether there was any change over a period of 6 years. The mode of delivery and detailed examination of newborn was also taken into account.

### All the still births were divided into two groups

Group A: Fresh still births (FSB)

Group B: Macerated still births (MSB)

The results were tabulated and analysed.

### RESULTS

In 2011, there were total 5906 deliveries over one year period and total still births were 124, thus giving incidence of 21.5/1000 live births. Various antepartum, intrapartum and postpartum observations were as follows.

**Table 1: Antenatal characteristics of still births in 2011.**

Variables	Total 124	Group A (FSB) 75 (60.5%)	Group B (MSB) 49 (39.5%)
Mean age		(19-38) avg-26.01 yrs	(18-42) avg-25.57 yrs
Antenatal registration	B-46 (37.1%)	B-34 (45.3%)	B-12 (24.5%)
	UB-78 (62.9%)	UB-41 (54.7%)	UB-37 (75.5%)
Parity	PGR-52 (41.9%)	PGR-29 (38.7%)	PGR-23 (46.9%)
	P2-4-65 (52.4%)	P2-4-41 (54.7%)	P2-4-24 (49.0%)
	P>4-07 (05.7%)	P>4 - 05 (06.6%)	P>4-02 (04.1%)
Period of Gestation (in weeks)	<32- 52 (42.0%)	<32- 40 (53.3%)	<32-12 (24.5%)
	32-36-31 (25.0%)	32-36-12 (16.0%)	32-36-19 (38.8%)
	36-40-37 (29.8%)	36-40-20 (26.7%)	36-40-17 (34.7%)
	>40 weeks-04 (03.2%)	>40 weeks-03(04.0%)	>40weeks-01 (02.0%)
Medical Disorders Associated with Pregnancy	Mild PIH- 12 (09.7%)	Mild - 08 (10.7%)	Mild - 04 (08.2%)
	Severe -20 (16.1%)	Severe - 11 (14.7%)	Severe - 09 (18.4%)
	Eclampsia- 08 (06.5%)	Eclampsia -06 (08.0%)	Eclampsia - 02 (04.1%)
	GDM - 02 (1.6%)	GDM - 01 (01.3%)	GDM - 01 (02.0%)
	V.Hepatitis-12 (09.7%)	V. Hepatitis - 08 (10.7%)	V. Hepatitis - 04 (08.2%)
Placental and umbilical cord complications	Pl. Praevia - 07 (5.7%)	Pl. Previa 05 (6.7%)	Pl. Previa - 02 (4.1%)
	Abruptio Pl - 11 (8.9%)	Abruptio Pl - 06 (8.0%)	Abruptio Pl - 05 (10.2%)
	Cord Prolapse - 5 (4.1%)	Cord Prolapse - 01 (1.3%)	Cord Prolapse - 04 (8.2%)
Antenatal complications	IUGR - 33 (26.6%)	IUGR -18 (24.0%)	IUGR-25 (51.0%)
	Mild - 13	Mild - 09	Mild - 04
	Severe - 20	Severe - 09	Severe - 21
	Polyhydramnios -06	Polyhydramnios - 05	Polyhydramnios - 01
	Hydrops Foetalis - 03	Hydrops Foetalis - 02	Hydrops Foetalis - 01
	PPROM - 05	PPROM - 04	PPROM - 01
	Multiple Preg. - 04	Multiple Preg. - 02	Multiple Preg. - 02
	Malpresentation - 23 (18.5%)	Malpresentation - 16 (21.3%)	Malpresentation - 07 (14.3%)
*Congenital anomalies	Anencephaly - 08	Anencephaly - 08	Anencephaly - 00
	Hydrocephalous - 04	Hydrocephalous - 04	Hydrocephalous - 00
	Omphalocoele - 03	Omphalocoele - 03	Omphalocoele - 00
	Multiple - 10	Multiple - 06	Multiple - 04

Following observations are made from Table 1 and Table 2

1. Incidence of fresh still birth was 60.5% and that of macerated still birth was 39.5%
2. Mean age of both the groups was comparable

3. More subjects were found to be unbooked in both the groups, incidence being 62.9% as compared to 37.1% (booked)
4. Still births were more frequently associated with prematurity as a whole as well as in FSB group (i.e.<32weeks- 53.3%) while MSB were more in the gestational period between 32-36 weeks (38.8%).
5. Most common medical disorder responsible for still births was hypertensive disorder with pregnancy (32.3%), most of the subjects with eclampsia had fresh still births. The incidence of GDM and viral hepatitis was comparable in both the groups.
6. Abruptio placenta was more frequent as a cause of still birth than placenta praevia, while cord prolapse was more associated with macerated still births (8.2% vs. 1.3%).
7. IUGR was most common antenatal complication responsible for still birth (26.6%) followed by malpresentation (18.5%). When we compare two groups, IUGR was found to be a cause in 51% of the MSB as compared to 24% in FSB group. Mal presentation was responsible for 24% of MSB as compared to 14.3% of FSB.
8. Congenital anomalies were responsible for still births in 20.2%, most common being multiple anomalies. All anencephaly foetuses resulted in FSB.
9. Incidence of spontaneous and induced labours were almost similar but more female foetuses were still born as compared to male foetuses (55.6% vs. 44.4%).
10. Because of more premature deliveries, the birth weight of more foetuses were <1.5kg or between 1.5-2.5kg and most of them delivered vaginally (89.5%). However, in some subjects operative procedures had to be adopted because of maternal indications.

**Table 2: Labour events.**

Onset of labour	Spont. - 64 (51.6%)	Spont. - 44 (58.7%)	Spont. - 20 (40.8%)
		Induced - 60 (48.4%)	Induced - 31 (41.3%)
Mode of delivery	Vaginal 111 (89.5%)	Vaginal - 67 (89.3%)	Vaginal - 44 (89.8%)
	Instrum. - 10 (08.1%)	Instrum. - 06 (08.0%)	Instrum. - 04 (08.2%)
	LSCS - 03 (02.4%)	LSCS - 02 (02.7%)	LSCS - 01 (02.0%)
Sex of baby	Male - 55 (44.4%)	Male - 31 (41.3%)	Male - 24 (49.0%)
	Female - 69 (55.5%)	Female - 44 (58.7%)	Female - 25 (51.0%)
Birth weight (In Kg)	<1.5kg - 71 (57.3%)	<1.5kg - 45 (60.0%)	<1.5kg - 26 (53.1%)
	1.5-2.5 - 36 (29.0%)	1.5 - 2.5 -19 (25.3%)	1.5 - 2.5 - 17 (34.7%)
	2.5-3.5 - 16 (12.9%)	2.5 - 3.5 - 10 (13.3%)	2.5 - 3.5 - 06 (12.2%)
	>3.5kg - 01 (0.8%)	>3.5kg - 01 (01.3%)	>3.5kg - 00

**Table 3: Antenatal characteristics of still births in 2017.**

Variables	Total- 128	Group A (FSB)=82	Group B (MSB)= 46
Mean age		(18-43) av-29.01years	(18-42) av-28.57years
Antenatal registration	B - 76 (59.4%)	B-52 (63.4%)	B-24 (52.2%)
	UB - 52 (40.6%)	UB-30 (36.6%)	UB-22 (47.8%)
Parity	PGR - 59 (46.1%)	PGR - 36 (43.9%)	PGR - 23 (50.0%)
	P2-4 - 63 (49.2%)	P2-4 - 45 (54.9%)	P2-4 - 18 (39.1%)
	P>4 - 06 (04.7%)	P>4 - 01 (01.2%)	P>4 - 05 (10.9%)
Period of gestation (in weeks)	<32- 35 (27.3%)	<32- 30 (36.6%)	<32- 05 (10.9%)
	32-36- 38 (29.7%)	32-36-18 (22.0%)	32-36-20 (43.5%)
	36-40- 46 (35.9%)	36-40-28 (34.1%)	36-40- 18 (39.1%)
Medical disorders associated with pregnancy	>40week- 09 (07.1%)	>40week- 06 (07.3%)	>40week- 03 (06.5%)
	PIH- Mild- 15 (11.7%)	PIH- Mild- 11 (13.4%)	PIH-Mild- 04 (8.7%)
	Severe- 20 (15.6%)	Severe - 12 (14.6%)	Severe - 08 (17.4%)
	Eclampsia - 6 (04.7%)	Eclampsia -05 (06.1%)	Eclampsia-01 (02.2%)
Placental and umbilical cord complications	GDM - 07 (05.5%)	GDM - 03 (03.7%)	GDM - 04 (8.7%)
	V.Hep-13 (10.2%)	V. Hep- 09 (11.0%)	V. Hep- 04 (8.7%)
	Pl. Previa - 1 (0.8%)	Pl. Previa - 1 (01.2%)	Pl. Previa - 00
Antenatal complications	Ab. Placenta -13 (10.2%)	Ab. Placenta - 11 (13.4%)	Ab. Placenta - 02 (04.3%)
	Cord Prolapse -7 (05.6%)	Cord Prolapse -7 (08.5%)	Cord Prolapse - 00
Antenatal complications	IUGR	IUGR	IUGR
	Mild - 11 (08.6%)	Mild - 08 (09.8%)	Mild - 03 (06.5%)

Variables	Total- 128	Group A (FSB)=82	Group B (MSB)= 46
	Severe - 34 (26.6%)	Severe - 18 (22.0%)	Severe - 16 (34.8%)
	Polyhydram.-02 (01.6%)	Polyhydram. 02 (02.5%)	Polyhydramnios - 00
	Hydrops Foetalis - 03 (04.8%)	Hydrops Foetalis - 02 (02.5%)	Hydrops Foetalis - 01 (02.2%)
	PPROM - 09 (07.0%)	PPROM - 08 (10.0%)	PPROM - 01 (02.2%)
	Multiple Preg. - 08 (06.3%)	Multiple Preg. - 06 (07.5%)	Multiple Preg. - 02 (04.4%)
	Malpresentation-08 (06.3%)	Malpresentation - 06 (07.5%)	Malpresentation - 02 (04.4%)
Congenital anomalies	Anencephaly-08 (6.3%)	Anencephaly- 08 (9.8%)	Anencephaly - 00
	Hydrocephalous - 05 (3.9%)	Hydrocephalous - 04 (4.9%)	Hydrocephalous - 01 (2.2%)
	Omphalocele - 03 (2.3%)	Omphalocele - 03 (3.7%)	Omphalocele - 00 (0.0%)
	Multiple - 10 (7.8%)	Multiple -06 (7.3%)	Multiple - 04 (8.7%)

Table 3: Labour events.

	<1.5kg - 58 (45.3%)	<1.5kg - 37 (45.1%)	<1.5kg - 21 (45.7%)
Birth weight	1.5 - 2.5kg - 46 (35.9%)	1.5 - 2.5kg - 29 (35.4%)	1.5 - 2.5kg - 17 (36.9%)
	2.5 - 3.5kg - 22 (17.2%)	2.5 - 3.5kg - 15 (18.3%)	2.5 - 3.5kg - 07 (15.2%)
	> 3.5kg - 02 (1.6%)	> 3.5kg - 01 (1.2%)	> 3.5kg - 01 (2.2%)
Sex of baby	Male - 64 (50%)	Male - 40 (48.8%)	Male - 24 (52.2%)
	Female - 64 (50%)	Female - 42 (51.2%)	Female - 22 (47.8%)
Onset of labour	Spontaneous - 78 (60.9%)	Spontaneous - 52 (63.4%)	Spontaneous - 26 (56.5%)
	Induced - 50 (39.1%)	Induced - 30 (36.6%)	Induced - 20 (43.5%)
Mode of delivery	Vaginal - 102 (79.7%)	Vaginal - 60 (73.1%)	Vaginal - 42 (91.3%)
	Instrumental - 05 (3.9%)	Instrumental - 05 (6.1%)	Instrumental - 00
	LSCS - 21 (24.2%)	LSCS - 17 (20.7%)	LSCS - 04 (8.7%)

Table 5: Comparison of antenatal characteristics of still births in 2011 and 2017.

Variables	Total - 124	Total - 128	Group A (Fresh SB- 2011)-75	Group A (Fresh SB- 2017)- 82	Group B (MSB -2011)- 49	Group B (MSB -2017)- 46
Mean age			(19-38) avg-26.01 years	(18-43) avg-29.01 years	(18-42) avg-25.57	(18-42) avg-28.57 years
Antenatal registration	B-46 (37.1%)	B-76 (59.4%)	B-34 (45.3%)	B-52 (63.4%)	B-12 (24.5%)	B-24 (52.2%)
	UB-78 (62.9%)	UB-52 (40.6%)	UB-41(54.7%)	UB-30 (36.6%)	UB-37 (75.5%)	UB-22 (47.8%)
Parity	PGR - 52 (41.9%)	PGR - 59 (46.1%)	PGR-29 (38.7%)	PGR -36 (43.9%)	PGR - 23 (46.9%)	PGR - 23 (50.0%)
	P2-4 - 65 (52.4%)	P2-4 - 63 (49.2%)	P2-4 - 41 (54.7%)	P2-4 - 45 (54.9%)	P2-4 - 24 (49.0%)	P2-4 - 18 (39.1%)
	P>4 - 07 (5.6%)	P>4 - 06 (4.7%)	P>4 - 05 (06.6%)	P>4 - 01(1.2%)	P>4 - 02 (04.1%)	P>4 - 05 (10.9%)
Period of gestation (in weeks)	<32-52 (42.0%)	<32-35 (27.3%)	<32-40 (53.3%)	<32-30 (36.6%)	<32-12 (24.5%)	<32-05 (10.9%)
	32-36 -31 (25.0%)	32-36- 38 (29.7%)	32-36 -12 (16.0%)	32-36-18 (22.0%)	32-36 -19 (38.8%)	32-36 -20 (43.5%)
	36-40 - 37 (29.8%)	36-40 - 46 (35.9%)	36-40 - 20 (26.7%)	36-40- 28 (34.1%)	36-40 - 17 (34.7%)	36-40 - 18 (39.1%)
	>40wks- 04 (3.2%)	>40wks- 09 (07.1%)	>40wks- 03 (04.0%)	>40wks- 06 (07.3%)	>40wks- 01 (02.0%)	>40wks- 03 (06.5%)
Medical disorders associated with pregnancy	PIH- Mild -12 (9.7%)	PIH- Mild -15 (11.7%)	PIH-Mild-08 (10.7%)	PIH-Mild-11 (13.4%)	PIH-Mild - 04 (08.2%)	PIH-Mild- 04 (08.7%)
	PIH- Severe- 20	PIH- Severe- 20	PIH-Severe - 11 (14.7%)	PIH-Severe - 12 (14.6%)	PIH- Severe -09 (18.4%)	PIH- Severe - 08 (17.5%)

Variables	Total - 124	Total - 128	Group A (Fresh SB-2011)-75	Group A (Fresh SB-2017)- 82	Group B (MSB -2011)- 49	Group B (MSB -2017)- 46
	(16.1%)	(15.6%)				
		Eclampsia - 06 (4.7%)		Eclampsia -05 (6.1%)		Eclampsia -01 (02.2%)
	GDM - 02 (1.6%)	GDM - 07 (5.5%)	GDM - 01 (1.3%)	GDM - 03 (3.7%)	GDM - 01 (02.0%)	GDM - 04 (08.8%)
	V. Hep- 12 (9.7%)	V. Hep- 13 (10.2%)	Viral Hep - 08 (10.7%)	Viral Hep - 09 (11.0%)	Viral Hep - 04 (08.2%)	V. Hep - 04 (08.8%)
Placental and umbilical cord complications	Placenta Previa - 07 (5.6%)	Placenta Previa - 01 (0.8%)	Placenta Previa - 05 (06.7%)	Placenta Previa - 01 (01.2%)	Placenta Previa - 02 (04.1%)	Placenta Previa - 00 (0%)
	Abruptio Placenta - 11 (8.9%)	Abruptio Placenta - 13 (10.2%)	Abruptio Placenta - 06 (08.0%)	Abruptio Placenta - 11 (13.4%)	Abruptio Placenta - 05(10.2%)	Abruptio Placenta - 02 (04.3%)
	Cord Prolapse- 05 (4.0%)	Cord Prolapse- 07 (5.5%)	Cord Prolapse- 01 (01.3%)	Cord Prolapse- 07 (08.5%)	Cord Prolapse- 04 (08.2%)	Cord Prolapse- 00 (0%)
Antenatal complications	IUGR Mild - 13 (10.5%)	IUGR Mild - 11 (8.6%)	IUGR Mild- 09 (12.0%)	IUGR Mild-08 (09.8%)	IUGR Mild - 04 (08.2%)	IUGR Mild - 03 (06.5%)
	Severe - 20 (16.1%)	Severe - 34 (26.6%)	Severe - 09 (12.0%)	Severe - 18 (21.9%)	Severe - 21 (42.9%)	Severe - 16 (34.8%)
	Polyhydramnios -06 (4.8%)	Polyhydramnios -02 (1.6%)	Polyhydramnios - 05 (06.7%)	Polyhydramnios - 02 (02.4%)	Polyhydramnios - 01(02.1%)	Polyhydramnios - 00(0.0%)
	Hydrops Foetalis - 03 (2.4%)	Hydrops Foetalis - 03 (2.3%)	Hydrops Foetalis - 02 (02.7%)	Hydrops Foetalis - (2.4%)	Hydrops Foetalis - 01(02.1%)	Hydrops Foetalis - 01(02.2%)
	PPROM - 05 (4.0%)	PPROM - 09 (7.0%)	PPROM - 04 (05.3%)	PPROM - 08 (09.8%)	PPROM - 01 (02.1%)	PPROM - 01 (02.2%)
	Multiple Preg. - 04 (3.2%)	Multiple Preg. - 08 (6.3%)	Multiple Preg. - 02 (02.7%)	Multiple Preg. - 06 (07.3%)	Multiple Preg. - 02 (04.2%)	Multiple Preg. - 02 (04.4%)
	Malpr-23 (18.5%)	Malpr- 08(6.3%)	Malpr- 16 (21.3%)	Malpr - 06 (07.3%)	Malpr- 07 (14.3%)	Malpr- 02 (04.4%)
Congenital anomalies	Anencephaly - 08 (6.4%)	Anencephaly - 08(6.3%)	Anencephaly - 08 (10.7%)	Anencephaly - 08 (09.8%)	Anencephaly - 00 (0.0%)	Anencephaly - 00 (0.0%)
	Hydrocephalous - 04 (3.2%)	Hydrocephalous - 05 (3.9%)	Hydrocephalous - 04 (05.3%)	Hydrocephalous - 05 (06.1%)	Hydrocephalous - 00 (0.0%)	Hydrocephalous - 01 (02.2%)
	Omphalocoele - 03 (2.4%)	Omphalocoele - 03 (2.3%)	Omphalocoele - 03 (04.0%)	Omphalocoele - 03 (03.7%)	Omphalocoele - 00 (0.0%)	Omphalocoele - 00 (0.0%)
	Multiple - 10 (8.1%)	Multiple - 10 (7.8%)	Multiple - 06 (08.0%)	Multiple - 10 (12.2%)	Multiple - 04 (08.2%)	Multiple - 04 (08.8%)

In 2017, there were total 6469 deliveries over one year period and total still births were 128, thus giving incidence of 20.1/1000 live births. Various antepartum, intrapartum and postpartum observations were as per Table II.

**Following observations are made from Table 3 and Table 4**

1. Incidence of fresh still birth was 64.1% and that of macerated still birth was 35.9%.
2. Mean age of both the groups was comparable.

3. More subjects were found to be booked in both the groups, incidence being 63.4% in group A and 52.2% in group B.
4. Maximum number of stillbirths i.e. 35.9% was at POG 36weeks-40weeks. FSB was more at POG < 32 weeks (36.6%) while incidence of MSB was more frequent in late preterm group i.e. 32-36 weeks (43.5%).
5. Most common medical disorder responsible for still births was hypertensive disorder with pregnancy (32%), most of the subjects with hypertensive disorders had fresh still births (44.1%) compared to MSB (28.3%).
6. Abruptio placentae and cord prolapse were more frequent as a cause of fresh still birth than MSB (13.4% vs. 4.3%) and (8.5% vs. 00%) respectively.
7. IUGR was most common antenatal complication responsible for still birth (35.2%). When we compare two groups, IUGR was found to be a cause in 41.3% of the MSB as compared to 31.8% in FSB group.
8. Foetuses with multiple congenital anomalies were the most common cause of still birth (7.8%) of which MSB was more (8.7%) compared to fresh still birth (7.3%). Anencephaly resulted only in FSB which was 6.3% of total.
9. There was no difference in the incidence of stillbirth in male or female foetuses but the incidence was more in spontaneous labor (60.9%) compared to induced labor (39.1%) for both the groups.
10. Because of more premature deliveries, the birth weight of more foetuses were <1.5kg (45.3%) or between 1.5-2.5kg (35.9%) and most of them delivered vaginally (79.7%). However, in some subjects operative procedures had to be adopted because of maternal indications.

When we compared the findings of 2011 and 2017, following interesting features were observed as shown in Table 3.

***From Table 5 and 6, following observations are made***

1. That there is not much difference in the incidence of the still births over a period of six years.
2. There was no change in the age group as well as mean age of the patients.
3. The number of booked subjects increased from 37.1% to 59.4%. Similarly more subjects were booked in FSB group (63.4%) and MSB group (52.2%). This is an interesting observation because despite increased booking status rate we didn't find decrease in the still birth rate which clearly depicts the inadequate and inappropriate antenatal care.
4. Both fresh and macerated still births increased marginally in PGR by about 4-5%, but macerated still births decreased by 10% among P2-4 which probably reflects that multigravidas are also seeking antenatal care.
5. Incidence of still births among extreme premature POG (<32weeks) showed substantial decrease by

- 15% over a period of six years. This is a positive findings indicating early detection and timely intervention of various high risk factors so that the pregnancy can be prolonged up to period of viability. On the contrary more macerated still births occurred at POG 32-34 weeks as well as 36-40weeks (increase by 5-6%). This can't be explained and excused but probably the high risk pregnancies require more strict foetal surveillance and early intervention after 32 weeks of pregnancy.
6. There was no difference in the incidence of PIH and Eclampsia still births but there was substantial increase in the incidence of still births in GDM patients from 1.6% to 5.5%. This clearly shows the overall increase in the diabetes among reproductive age group.
7. Among placental causes, there was significant decline in the still birth rate among placenta praevia group (by 7 times) over a period of six years. This clearly reflects better diagnosis of placenta praevia due to routine USG and better management of major degree placenta praevia. There was no difference in the incidence of abruptio placentae resulting in still births, however, there was 2-3 fold decrease in the macerated still birth rate among this group (4.3% vs. 10.2%) which again reflects better management of all APH cases.
8. When we review the cord prolapse as a cause of still birth, there was no difference in the overall incidence but more fresh still births occurred in 2017 as compared to 2011 (8.5% vs. 1.3%) but no macerated still birth occurred in 2017 (0% vs. 8.2%). This clearly indicates the gap between the diagnosis and management of a case of cord prolapse. Once the diagnosis of cord prolapse is made, there is need of Em. LSCS within 30 minutes.
9. When we compare antenatal complications, IUGR was still the most commonest cause resulting in still birth. FSB rate increased in IUGR group but macerated still births decreased. This is definitely because of better foetal surveillance by doppler velocitometry and BPP and active intervention in cases of foetal hypoxia.
10. There was no significant change in other antenatal complications over six years except mal presentation. The incidence of mal presentation leading to still birth decreased substantially. This is clearly because of prior diagnosis due to routine USG and liberal use of LSCS resulting in better live birth rate than monitoring the patient for prolonged and obstructed labour.
11. It was interesting to note that there was no significant change in the still birth rate due to congenital malformations despite widespread availability of USG, still there were 26 patients who had still birth with either single or multiple anomaly (leave apart the live births) and the most common being anencephaly. This point shows the unmet need and present gap in the detection of congenital anomalies. There can be two possibilities- Firstly there may be

significant number of patients who could not get anomaly scan and hence MTP done before 20 weeks. Secondly there are some antenatal patients who get timely scan done but the anomalies remained undiagnosed. Certainly we must improve quantity as well as quality of our ultrasound facilities.

12. When we compare labour events, there was no significant change in the birth weights and sex of the still born babies over six year period. Though

maximum subjects delivered vaginally but there was definite rise in the caesarean section rate 20.7% vs. 2.7% for FSB and 8.7% vs. 2.0% for MSB. This again reflects liberalization of LSCS for maternal indications. However, the use of caesarean section was likely to be the consequence of complication leading to still birth rather than caesarean section being a risk factor for still birth.

**Table 6: Labour events.**

	<1.5kg - 71 (57.3%)	<1.5kg - 58 (45.3%)	<1.5kg - 45 (60.0%)	<1.5kg - 37 (45.1%)	<1.5kg - 26 (53.1%)	<1.5kg - 21 (45.7%)
Birth weight	1.5-2.5kg-36 (29.0%)	1.5-2.5kg -46 (35.9%)	1.5-2.5kg-19 (25.3%)	1.5-2.5kg -29 (35.4%)	1.5-2.5kg- 17 (34.7%)	1.5-2.5kg - 17 (36.9%)
	2.5-3.5kg- 16 (12.9%)	2.5-3.5kg - 22 (17.2%)	2.5-3.5kg- 10 (13.3%)	2.5-3.5kg - 15 (18.3%)	2.5-3.5kg- 06 (12.2%)	2.5-3.5kg - 07 (15.2%)
	> 3.5kg - 01 (0.8%)	> 3.5kg - 02 (1.6%)	> 3.5kg - 01 (0.13%)	> 3.5kg - 01 (1.2%)	> 3.5kg - 00 (0.0%)	> 3.5kg - 01 (2.2%)
Sex of baby	Male - 55 (44.4%)	Male- 64 (50%)	Male - 31 (41.3%)	Male - 40 (48.8%)	Male - 24 (49.0%)	Male - 24 (52.2%)
	Female- 69 (55.5%)	Female- 64 (50%)	Female- 44 (58.7%)	Female- 42 (51.2%)	Female- 25 (51.0%)	Female -22 (47.8%)
Onset of labour	Spont. -64 (51.6%)	Spont. - 78 (60.9%)	Spont. - 44 (58.7%)	Spont. - 52 (63.4%)	Spont. - 20 (40.8%)	Spont. - 26 (56.5%)
	Induced - 60 (48.4%)	Induced - 50 (39.1%)	Induced - 31 (41.3%)	Induced - 30 (36.6%)	Induced - 29 (59.2%)	Induced - 20 (43.5%)
Mode of delivery	Vag-111 (89.5%)	Vag- 102 (79.7%)	Vaginal - 67 (89.3%)	Vaginal - 60 (73.1%)	Vaginal - 44 (89.8%)	Vaginal - 42 (91.3%)
	Instrum.-10 (08.1%)	Instrum - 05 (3.9%)	Instrum - 06 (08.0%)	Instrum - 05 (6.1%)	Instrum. - 04 (08.2%)	Instrum- 00 (0.0%)
	LSCS - 03 (02.4%)	LSCS - 21 (24.2%)	LSCS - 02 (02.7%)	LSCS - 17 (20.7%)	LSCS - 01 (02.0%)	LSCS - 04 (8.7%)

## DISCUSSION

The perinatal mortality surveillance report (CEMACH) has defined still birth as a baby delivered with no signs of life known to have died after 24 completed weeks of life. Foetal demise is a traumatic experience for both parents as well as treating obstetrician. Antepartum still births are a major contributor to perinatal mortality.

A large proportion of these deaths have no apparent cause. In literature, the proportion of still births without a known cause of death varies from 7 to 82%.The lowest rates of still births have been reported from Finland and Singapore (2 per 1000 births) and from Norway and Denmark (2.2 per 1000 births) most of the still births occur in developing nations, with ten countries (Pakistan, Nigeria, China, Demographic Republic of Congo, Ethiopia, Bangladesh, Indonesia, Tanzania, Afganistan and India) accounting for more than two third of all cases.

When death of a foetus occurs before delivery, degenerative changes begin immediately and dead retained foetus undergoes maceration. Maceration is characterized by softening and peeling of skin and discoloration and softening of viscera. These changes are no putrefactive and progressive. Nearly 60% of the deaths are still births. Unexplained antepartum still births are now a major contributor to perinatal mortality in developed countries whereas in developing nations, preventable factors like asphyxia, infection, traumatic cerebral haemorrhage and intracranial damage from difficult labour and delivery are responsible for majority of cases. One or more antenatal or intranatal factors which cause death of the foetus could be identified in more than 80%of the cases. Regular antenatal screening of all pregnant women is essential to detect high risk pregnancy and to intervene at appropriate time to prevent still birth. Proper antenatal and intranatal supervision can prevent severe anaemia, malaria, Pre-eclampsia with severe features, IUGR, obstructed labour and many other complications. Despite advances in field of diagnosis and

management of various diseases, still there is scope of much improvement as far as the preventive aspect of antenatal care is concerned.

Mueller RF et al have recommended variety of procedures for post-mortem examination of stillbirths to determine the cause of the loss of the pregnancy and to provide an estimate of the risk of recurrence. We studied the relative usefulness of several such techniques, including gross and microscopical autopsy, photography, radiography, bacterial cultures, and chromosome studies. In 44 (35 per cent) of 124 cases of stillbirth or early neonatal death, structural physical abnormalities were evident at autopsy. In 35 of the 44 cases the abnormalities were due to chromosomal, single-gene, or polygenic disorders. The single most useful examination was the gross autopsy. Analysis of the various procedures suggests that when resources are limited, gross autopsy, photography, radiography, and bacterial cultures should be performed in all cases of stillbirth and early neonatal death, but that karyo typing and histopathology may be used selectively. This approach should minimize the use of expensive, low-yield procedures without compromising the ability to provide information for purposes of genetic counseling.<sup>1</sup>

One of the major success stories of modern obstetrics in high-income countries is the reduction of stillbirths. Rates as high as 50 per 1000 births or more were common 40-50 years ago, but are now often less than 5 per 1000 births - nearly a ten-fold reduction.<sup>2</sup> Exactly why this reduction has occurred is not completely clear, but it is almost certainly related to the nearly universal availability of antenatal and intrapartum care that focuses on risk-identification and reduction, and treatment of obstetric complications as they arise. Fetal mortality associated with obstructed labour, asphyxia, hypertension, diabetes, Rh disease, placental abruption, post-term pregnancies and infections such as syphilis has declined. Many of the interventions that treat these conditions have never been studied individually regarding their impact on stillbirth rates, but their collective introduction over the last 50 years appears to have resulted in the impressive reduction in stillbirths described above.

Major cause of non-preventable still births was found to be congenital anomalies and placental causes like placenta praevia. So all the attending obstetricians should follow rule of at least one ultrasound (anomaly scan) at 16-18 weeks so that termination of pregnancy can be done if required. In case of placenta praevia, early detection, rest and admission to hospital and correction of anaemia can definitely go a long way to conduct the delivery/caesarean in a planned way. This will definitely decrease the load of emergency services with better neonatal and maternal outcome.

Allen VM et al conducted a study to evaluate the effect of hypertensive disorders in pregnancy on small for

gestational age and stillbirth which was a population based study.<sup>3</sup> There was an increased risk of stillbirth among women with any hypertensive disorder (RR 1.4, 95% CI 1.1,1.8) and among women with pregnancies complicated by chronic hypertension (RR 2.4, 95% CI 1.2,5.1) or chronic hypertension with superimposed PIH (RR 4.4, 95% CI 2.2,8.8), compared with normotensive pregnancies. After controlling for potential confounders, women with any hypertensive disorder were 1.4 (95% CI 1.1,1.8,  $p=0.02$ ) times more likely to have a stillbirth as compared with normotensive women. Women with pre-existing hypertension were 3.2 (95% CI 1.9,5.4,  $p<0.001$ ) times more likely to have a stillbirth as compared with normotensive women. However, reductions in stillbirth rates have not been uniform across all gestational ages, or types of stillbirth. In high-income countries, it is now very uncommon for stillbirths to occur at term, or in the intrapartum period, so that most stillbirths now occur antenatally and are pre-term. In fact, 50% or more of the stillbirths occur prior to 28 weeks gestation.<sup>4</sup> Despite the historical successes, in recent years, the downward trajectory of stillbirth rates in high-income countries has nearly ceased. Consequently, a number of research efforts are underway to understand the recent lack of progress and to develop new interventions that will contribute to further reductions in stillbirth. To achieve success in high-income countries, these interventions will need to reduce stillbirths that occur during the antenatal period and in pre-term fetuses. Current stillbirth rates in many low- and middle-income countries, and especially those areas within the countries with poorly functioning health systems, approximate those seen in high-income countries 50 years ago.<sup>5-8</sup> A major difference between the stillbirths occurring in high-income countries and those occurring elsewhere is the preponderance of late pre-term, term and intrapartum stillbirths. Those stillbirths should be relatively easy to prevent by known risk assessment methods and prompt delivery, often by Cesarean section. Providing the components of modern obstetric care as practiced in most high-income countries should substantially reduce stillbirth rates in low- and middle-income countries with poorly developed health systems.<sup>9-12</sup> Simultaneously the women in reproductive age, their husbands and their families should be educated for early registration, proper antenatal checkups, warning signs and symptoms, facilities available for antenatal women like free institutional delivery, free transportation and various centives for the pregnant women. All these facilities are being provided by government through various programmes, free of cost and in whole of the country.

## CONCLUSION

The still birth of a baby awaited with joy is a bitter calamity. Despite advances in diagnostic and therapeutic modalities, large numbers of still births remain unexplained. Mortality rate has to be decreased drastically by improving maternal nutrition, adopting small family norm, strengthening of health care services

and good antenatal care and above all timely referral. Prevention is therefore hallmark of preventing still birth. If the sound principles of accurate determination of gestational age and identification of high risk pregnancy. Meticulous care of medical condition and careful attention to progress of pregnancy is done, a lot more can be achieved. Above all, more and more institutional and supervised deliveries along with timely intervention can reduce the incidence of intrapartum and early neonatal losses.

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