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Retrospective study to evaluate risk factors of still birth

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Abstract
Introduction: Stillbirth is a tragic events for parents and obstetricians. Still birth is defined as "delivery of a foetus that has died before birth for which there is no possibility of resuscitation, after 24 weeks of gestational age (After a period of viability) and/ or birth weight ≥500 grams." In INDIA period of viability is ≥28 weeks.
Objectives: To study the following factors in relation to occurrence of Stillbirth in Obstetrics and Gynaecology department R.N.T.M.C. Udaipur.
1 Incidence of Still birth over the time period of study.
2 Etiological factors and risk factors of still birth.
3 Study the role of antenatal care in prevention of foetal death.
Materials and Methods: Pregnancies diagnosed with stillbirth will studied retrospectively in department of obstetrics and gynaecology, R.N.T.M.C., Udaipur from 1 July 2017 to 30 June 2018 from hospital records.
Results: In our study 19723 births occurred, out of which total stillbirths were 929 (4.7%). Stillbirth rate in this period in our hospital was 47 stillbirths /1000 total births. Out of 929 stillbirths Ante-partum (Macerated) are 384 (41.33%) and Intra-partum (fresh) are 545 (58.66%). Stillbirth rate was highest (6.7%) in teenage patients and then again rise in ≥30 years of age women (5.6%). Risk of stillbirth was higher in primigravidas (7%) and multigravidas ≥ fourth (10%). In our study largest percentage of stillborn babies were preterm (54.7%) between gestational age of 29-36 weeks, 25.3% stillbirths were ≤28 weeks of gestational age. 92.68% (861) patients had absent foetal heart sound at admission. Nearly half 50.8% (n=472) stillbirths occurred in patients whose foetal birth weight was ≤1500 grams. In our study large percentage of stillbirths i.e.81.7% (n==759) occurred in the Un-booked emergencies. In our study patients having Haemoglobin level <5 gm%, 40% births result in Stillbirths. In patients whose haemoglobin was 5-6.9 gm%, Stillbirth incidence is 13.5%. Largest no. of stillbirths occurred in rural areas 787 (84.71%). In 26.48% (n=246) cases exact cause of Stillbirth remain undetermined. Among determined causes commonest cause was placental pathology 192 (20.67%). 112 (12.05%) stillbirths had congenital malformation. Most common was anencephaly. In our study 9.6% cases had hypertension in pregnancy.
Conclusion: In our study leading cause are placental pathology, congenital malformation, hypertension in pregnancy, foetal distress. majority of cases had no FHS at admission and they did not have proper antenatal check- ups. Significant proportion of Stillbirth is preventable by health education to adolescents girls and parents about regular and proper antenatal check –ups, warning signs during antenatal period, hospital delivery and early referral.

Keywords: Stillbirth, WHO (world health organisation), incidence

Introduction
Still birth is a traumatic and devastating condition for patients, their families and obstetricians. An empathetic approach is desirable towards the couple and their families for counselling and emotional support. A systematic approach to find the cause of still birth is essential because Identification of aetiology will be helpful in formulating the preventive measures for better outcome in subsequent pregnancies.
Determination of causes and risk factors of still birth aids maternal coping, help assuage any perceived guilt, permits more accurate counselling regarding recurrence risk, and may prompt therapy or intervention to prevent a similar outcome in subsequent pregnancies (American college Obstetrics and Gynaecologist,2016a). Identification of inherited syndrome also provides useful information for other family members [1]. Stillbirth is an important indicator of maternal and perinatal health of given population. Still birth is useful index to measure the values of antenatal and intranatal care [2].

According to WHO Still birth rate in World is 24.7 in 2000 and 18.4 in 2015 and In India is 33.4 in 2000 and 23 still birth/1000 total birth in 2015 [3].

Aims and objectives: To study the following factors in relation to occurrence of stillbirth in Obstetrics and Gynaecology department R.N.T.M.C. Udaipur.

1. Incidence of Stillbirth over the time period of study.
2. Etiological factors and risk factors of stillbirth.
3. Study the role of antenatal care in prevention of foetal death.
4. Determination of causes is needed to propose measures to prevent recurrence of stillbirth and for counselling of parents and management for future pregnancy.

Materials and Methods: Pregnancies diagnosed with stillbirth will studied respectively in department of obstetrics and gynaecology of tertiary care hospital R.N.T.M.C. (Ravindra Nath Tagore Medical College) Udaipur, Rajasthan India from 1 July 2017 to 30 June 2018 for one year period. All the patient admitted in clean and emergency labour room who gave birth to a stillborn baby (Ante-partum/Intra-partum) were included in this study. Case study was done as par the Performa attached, from hospital records and analysed accordingly to know cause of stillbirth and also to know that stillbirth is Ante-partum or Intra-partum.

Inclusion criteria

1. Gestational age ≥28 weeks at delivery of baby.
2. Baby weight ≥500 gms.
3. Ante-partum or Intra-partum death of baby.

Observation: Over the study period total 19723 patients delivered, out of which total stillbirths were 929. Incidence of stillbirth in our hospital during study period was 4.7%. Out of 929 stillbirths Ante-partum (Macerated) were 384 (41.33%), and Intra-partum (Fresh) were 545 (58.66%).

Table 1: Type of group

Period of study	Total no. of deliveries	No. of macerated still births (Ante partum) (Group A)	No. offresh still births (Intra partum) Group B	Overall total still births
1 July 2017-30 June 2018	19723	384 (1.94%)	545 (2.76%)	929 (4.7%)

Table 2: Stillbirths in relation to maternal age

Maternal Age (years)	Total no. of births (%)	Total still births (%)	Percentage (%)
≤ 19	314(1.59)	21(2.26)	6.7
>19 to <30	16665(84.5)	754(81.16)	4.5
≥ 30	2744(13.91)	154(16.58)	5.6
Total	19723(100)	929(100)	4.7

In our study stillbirth Incidence was highest (6.7%) in teenage pregnancies and then again rise in ≥30 years of age women (5.6%).

Table 3: Stillbirths in relation to parity

Parity	Total no. of births (%)	Total still births (%)	Percentage (%)
First	5486(27.81)	384 (41.33)	7
Second	8330(42.24)	260 (27.99)	3.12
Third	4537(23)	148(15.93)	3.26
≥ Fourth	1370(6.95)	137 (14.75)	10
Total	19723(100)	929(100)	23.38

Risk of stillbirth was higher in primipara (7%) and multipara ≥ fourth (10%).

Table 4: Stillbirths in relation to period of gestation

Gestational age (weeks)	Total still births	Percentage (%)
28-32	386	41.55
32+1 - 36+6	357	38.43
≥ 37	186	20.02
Total	929	100

Largest percentage of stillborn babies were preterm (41.55%) between gestational age of 28-32 weeks, 38.43% stillbirths were 32+1 to 36+6 weeks, and 20.02% stillbirths were ≥37 weeks. 79.98% were preterm stillbirths. so we can say that prematurity was a high risk factor for stillbirths.

115 (12.47%) pregnant women came in our hospital with history of stillbirth in previous pregnancy.

Table 5: Stillbirths in relation to FHS at admission

Present	Absent	Total
68 (7.32%)	861 (92.68%)	929 (100%)

92.68% (861) pregnancies came with absent foetal heart sound at admission, only 7.32% (n=68) pregnancies came in our hospital with present foetal heart sound at admission and ultimately end in stillbirth.

Table 6: Stillbirth in relation to birth weight

Birth weight (grams)	Group A (Macerated)	Group B (Fresh)	Total Stillbirths	Percentage (%)
500-1500	317	155	472	50.80
1501-2500	112	185	297	31.97
2501-3500	113	43	156	16.79
>3500	3	1	4	0.43
Total	545	384	929	100

50.80% (n=472) i.e. highest stillbirths occurred with birth weight of 500-1500 grams, 31.97% (n=297) stillbirth occurred

with birth weight of 1501-2500 grams. In this we observed that >85.46% stillbirths occurred with birth weight <2500 grams, so LBW was a high risk factor for stillbirth.

Table 7: Stillbirths in relation to booking status

Status	Group A	Group B	Total	Percentage (%)
Booked	90	80	170	18.3
Un-booked	455	304	759	81.7
Total	545	384	929	100

Majority of stillbirths i.e.81.7% (n=759) occurred in the Un-booked women. Only 18.3% (n=170) patients were booked. Un-booked were those pregnant women who did not received at least ≥ 4 proper ante natal visits in any hospital.

Table 8: Stillbirths in relation rural or urban population

Rural/Urban	No. of Stillbirths	Percentage (%)
Rural	787	84.71
Urban	142	15.29
Total	929	100

Largest no. of stillbirths occurred in rural areas 787 (84.71%) as compared to urban areas 142 (15.29%).
Most of stillbirths delivered as vaginal delivery (Spontaneous +induced) 746 (80.3%). 137(14.75%) cases delivered by lower segment cesarean section (LSCS).

Table 9: Probable causes of still births

S. No.	Probable causes of Stillbirths	No. of Stillbirths	Percentages (%)
1	Abruption placentae	168	18.08
2	Placenta praevia	25	2.69
3	Ante partum eclampsia	38	4.09
4	Pre eclamptic toxicity	51	5.49
5	Cord accidents (Prolapsed + CRN)	34	3.66
6	Obstructed labour	9	0.97
7	Rupture uterus	9	0.97
8	Maternal infection	14	1.50
9	Congenital malformations	112	12.05
10	IUGR	13	1.4
11	Birth asphyxia	7	0.75
12	Hydrops foetalis	1	0.11
13	PPROM	11	1.18
14	Severe oligohydramnios	80	8.61
15	Meconium aspiration	65	7.0
16	Arrest of after coming head	12	1.29
17	Maternal disease other than hypertension in pregnancy	34	3.66
18	Unclassified	246	26.48
	Total	929	100

There is large no. of 26.48% (n=246) where the exact cause of Stillbirth remained largely unclassified. Among classified causes commonest cause was abruption placentae 16(18.08%) and 25 (2.69%) stillbirths occurred due to placenta praevia. Second commonest cause was congenital malformations 112 (12.05%), hypertension in pregnancy-APE 38 cases (4.095) and PET 51(5.49%), 80(8.61%) stillbirths occurred due to severe oligohydramnios, 65 (7.0%) stillbirths occurred due to fetal distress because of meconium aspiration intra- partum or ante-partum. 34(3.66%) stillbirths due cord accidents (cord prolapsed or cord round neck or knot or short cord), 34(3.66%) due to maternal disease (most common maternal diseases are hypertension). 14(1.5%) stillbirths were due to maternal infections (most common maternal infection was malaria-11 cases), 13 (1.4%) IUGR (intra uterine growth restriction, 12(1.29%) may be due to arrest of after coming head in breech delivery, 11(1.18%) stillbirths due to PPROM (preterm premature rupture of membranes).
Overall incidence of congenital malformation was 112(12.05%), out of these according to this table most common congenital malformation was neural tube defect like anencephaly 47(41.96%), Meningomyelocele 6 (5.36%), Second common type of malformation was hydrocephalus is 13(11.6%).

Discussion: Stillbirth is high magnitude public health issue in INDIA and important indicator of maternal health, availability and accessibility of health care delivery system.
In our study incidence of stillbirths during study period was 47/1000 total births (929 stillbirths out of 19723 deliveries). The incidence was almost similar to different studies, 49 in a study by Dr. Anjali Chaudhary and Dr. Vineeta Gupta (2014) [7], Higher stillbirth in our study may be due to selection bias because our hospital is a tertiary care referral centre and all major obstetric complication identified in the periphery, referred here. Another reason may be inadequate ante natal care due to various reasons.
In our study stillbirth rate was highest in teenage (≤19 years) pregnancies -6.7% and again rise ≥ 30 years of maternal age 5.6% i.e. extreme of age is high risk factor for stillbirth. This occur due to various complications like hypertension in pregnancy, anaemia etc. were common in teenage. Congenital malformations, preterm labour, ante-partum haemorrhage etc. were more common in women ≥30 years of age. The age group of 20-30 years is safest for both mother and baby.
In our study stillbirths were highest in multipara who had ≥4 pregnancies 10%, and in primipara 7% which were similar to study by Dr. Sharmishtha Das and Dr. Vimlesh Mathur (2002). This occurs due to obstetrical complications like pre eclamptic toxicity and antepartum eclampsia, etc. were more common in primipara and congenital malformations, uterine rupture, obstructed labour, malpresentations etc. are more common in multipara.
In our study stillbirths were highest in gestational age group 29-36 weeks 54.7%. This was similar as a study by Aditi Jindal, Rama Thakur *et al* (2018) [10] stillbirths were highest in gestational age group 28-36+6 weeks 39.3% [11], i.e. Prematurity and pre term delivery is a high risk factor for stillbirth. Though better obstetrical care can help in reducing these group of foetal deaths.
Overall in our study 50.8% stillbirths were belonged to birth weight of 500-1500 grams, which were very low birth weight babies. 37.96% stillbirth belong to 1501-2500grams birth weight, which were similar to study by Dr. B.P. Das and Dr. S. K. Das *et al* (2018) [10]. It shows that very low birth weight (VLBW- 500-1500 grams) and low birth weight (LBW- 1501-2499 grams) babies were at higher risk for stillbirth due immaturity of various systems most commonly respiratory system immaturity. These death can be minimized by preventing or arresting preterm labour, avoiding trauma during labour.
In our study 81.7% were un-booked and 18.29% patients were booked, which were similar to study by Aditi Jindal, Rama Thakur *et al* (2018). The higher incidence of stillbirth in un-booked cases was due to improper antenatal care. By adequate antenatal care we can screen high risk pregnancies and treat them timely and properly. It was noted that 84.71% stillbirths were from rural areas in our study. Most of the booked cases

were from urban areas and having better education and socio-economic status, because of easily accessibility to the hospital and adequate ante natal care was more in urban areas. Socio economic status of the patients had its influence on ante natal care because of high literacy, increased awareness, increased per capita income and easily accessibility of health care centre.
This can be reduced by health education, hygiene and antenatal care education to adolescent girls at school level and parents at Anganwadi level, strengthening of Anganwadi centre, Peripheral health centre (PHC) and community health centre (CHC), Improvement of information and technology, and regular and better training of peripheral staff.
In our study 26.48% (n=246) cases of stillbirths, the exact cause of Stillbirth remain largely unexplained where the cause of SB is not identified. In a study by Neetu Singh, Kiran Pandey *et al* (2013) [6] 33.44% cases causes were unexplained.
Among classified causes commonest cause was abruption placentae 167(17.98%) and 25 (2.69%) stillbirths occurred due to placenta previa. Which were almost similar a study by Swapnil Patel, Rajal Thaker *et al* (2014) [2] 12.5% cases were due to abruption placentae. These were preventable timely diagnosis and prevention or proper treatment by adequate ante natal care. Hypertension in pregnancy, hypercoagulation disorders ex. APLA, maternal infections severe anaemia etc. were high risk factors associated with abruption placentae, so treatment of cause, and prevention of further separation of placenta in mild degree separation by adequate treatment or by giving steroid whenever possible in preterm pregnancies. Education and accessibility of health facility, availability of timely transport also helpful in decreasing such type stillbirths.
Second commonest cause was congenital malformations 112 (12.05%), most common congenital malformation was neural tube defect like anencephaly 47(41.96%). In a study by Neetu Singh, Kiran Pandey *et al* (2013) [26] 9.45% causes were congenital malformations. Most of stillbirths from congenital malformations were not preventable. These stillbirths can be reduced by timely diagnosis and proper treatment of the cause causing congenital malformation ex. adequate control of blood sugar in diabetics, treatment of hypothyroidism etc. Congenital malformations associated due to chromosomal abnormalities were not preventable they should be terminated after diagnosis by various methods during antenatal period in first trimester or up to 20 weeks of gestation. Neural tube defects can be reduced by giving folic acid during periconceptional period and during first trimester.

Hypertension in pregnancy: 88 (9.47%) cases, out of which APE 38 cases (4.095) and PET 51(5.49%), 65 (7.0%) stillbirths occurred due to fetal distress because of meconium aspiration intra partum or ante partum.
34 (3.66%) stillbirths due cord accidents (Cord prolapsed or cord round neck or knot or short cord) which were emergency admissions, which were almost similar as study by Swapnil Patel, Rajal Thaker *et al* (2014) [2] in which 2.5% cases were of cord accidents.
13(1.4%) stillbirths occurred due to IUGR (Intra uterine growth restriction), such deaths were preventable by screening for fetal growth restriction, identification and timely adequate intervention an accepted strategy.
12(1.29%) stillbirths may be due to arrest of after coming head in breech delivery, 11(1.18%) stillbirths due to PPROM (Preterm premature rupture of membranes). 9(0.97%) stillbirths due to obstructed labour, 9(0.97%) stillbirths due to Rupture Uterus, 7(0.75%) stillbirths due to Birth asphyxia, 1(0.11%) stillbirths due to hydrops fetalis.

Conclusion: We choose this topic because India had highest no. of stillbirths in 2015 estimated at 5,92,090 stillbirths and stillbirth rate was 22 in every 1000 pregnancies in 2015 but because of its huge population, the country recorded highest number of stillbirths around the world [13]. By this study we can diagnose the probable cause of stillbirth and by improving antenatal and Intra-natal services, we can minimize the stillbirth rate.
In this study four priority areas are used –
1. Incidence of Still births.
2. Etiological factors and risk factors of still births.
3. Role of antenatal care in prevention of foetal deaths.
4. Government response toward stillbirths.

Death of the foetuses due to congenital anomalies cannot preventable today but can be reduced by earlier diagnosis of congenital malformations by proper ANCs check-ups, ultrasound and pre-conceptional chromosomal study of both parents. Causes like congenital anomalies require genetic counselling.
Deaths due to cord accidents cannot be prevented totally but can be minimized by earlier diagnosis by colour Doppler ultrasonography and can be managed accordingly.
All other factors can be prevented from causing stillbirths by proper antenatal care and undertaking induction of labour at an optimum time. Regular follow-up plays a major role in preventing foetal loss and recurrence. Education of the patient to avail obstetric care, more frequent visits for high risk pregnancies, timely reference to specialist will minimize foetal loss.

Government response toward stillbirth
Stillbirth is a challenging issue for government. Reduction of stillbirth required better policy and its implementation through health care staff. For this purpose a better health information system (HMIS) must be present so that magnitude of stillbirth, risk factors, etiological factors can be identified at policy making level.
By Government a integrated use of health informatics is developing for better human resource management, GIS (Geographic information system) applications, mobile health, maintaining patient information in hospitals, nutrition and disease surveillance systems, death reporting, follow-up systems including systematic pregnancy and child tracking in different parts of India [14].
A novel approach i.e. National Rural Health Mission (NRHM) and national urban health mission (NUHM) launched by the Government of India in April 2005, it was further extended in march 2018, to continue until march 2020 to provide better healthcare and advance institutional deliveries, leads to reduced number of stillbirths [15].
Janani Suraksha Yojna (JSY) is safe motherhood intervention scheme implemented by government of India and launched in 12 April 2005 [16].
Government of India created a various post in health system i.e. Auxillary Nurse Midwife (ANM), accredited social health activist (ASHA), Anganwadi worker (AWW), which act as a grass-roots worker. Government of India also launched a 102 free Ambulance service or National Ambulance Service (NAS), these are available free of cost 24×7 to pregnant women [16].
Mother and Child Tracking System (MCTS) jointly developed by the Ministry of Health and Family Welfare and National

Informatics Centre, launched by the Government of India in 2009 in collaboration with the states. MCTS serves as an important tool to capture the health of both mother and child at national level. The tracking system gives multiple dimensions to the mother and child's health and facilitates the service providers at the grass root levels i.e. information related to pregnant women is being entered in MCTS from 139,551 (84%) sub-centers, 22,558 (79%) health facilities other than sub-centers. More than 1.77 crore pregnant women and 1.20 crore children have been registered in the system since its inception. In this way, the system contributes towards universal access to healthcare services for pregnant women and children, and keeps track of maternal mortality and perinatal mortality including stillbirths [17].

WHO is today launching The every newborn action plan (ENAP) in 2014 to end preventable deaths has a set stillbirth target of 12 per 1000 births or less by 2030 [18].

The INDIA NEWBORN ACTION PLAN (INAP) was launched in September 2014with aim of ending preventable stillbirths by 2030. Goal is attain the single digit stillbirth rate by 2030 [1]

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