"ASSOCIATION BETWEEN MATERNAL AND FETAL RISK FACTORS AND STILLBIRTHS IN TERTIARY CARE HOSPITAL IN BELAGAVI- A ONE YEAR OBSERVATIONAL STUDY"

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LIST OF ABBREVIATION

LSCS	–	lower segment caesarean section
BMI	–	body mass index
VBAC	–	vaginal birth after caesarean section
IUD	–	intrautrerine death
IUFD	–	intrauterine fetal death
FHS	-	fetal heart sounds
GDM	-	gestational diabetes mellitus
PROM	-	premature rupture of membrane
APH	-	antepartum haemorrhage
IUGR	-	intrauterine growth restriction
No.	–	number
PIH	–	pregnancy induced hypertension
PPROM	–	preterm premature rupture of membrane

ABSTRACT

BACKGROUD AND OBJECTIVES

Stillbirth still remains the most prevalent adverse outcome of pregnancy. Death of a viable fetus is one of the unhappy events in the field of obstetrics. Stillbirth is a sensitive indicator for maternal care during antenatal and intrapartum period. It also reflects the obstetrician's vigilant care during pregnancy. Thus it is important to identify the probable causes and risk factors associated with fetal loss to determine the risk of recurrences, prevention and to plan a strategy for its correction. This study was taken with the objective to know the association between maternal and fetal risk factors and stillbirths.

METHODOLOGY

A descriptive observational study is undertaken in labour room at KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi. The cases of intra-uterine fetal death either with ultrasound reports proving IUD and diagnosed on clinical examination by absence of fetal heart rate were studied during the study period of Jaunary 2017 December 2017. All stillbirths ($\geq$ 20weeks of pregnancy or$\geq$ 500gms of the fetus) (according to ACOG 2009) who gave consent were included in the study. Data was entered in Microsoft 2010 Excel sheet. Obtained data was tabulated and analysed using rates, ratios and percentages. Chi-Square Test is applied for each of the risk factor to know its association with stillbirth. Risk associated with factors estimated using Odds ratio. P value $\leq$ .005 is considered significant.

RESULT

Total of 171 cases were included in the study out of 5755 total delivery. The incidence of stillbirth was found to be 2.97% and stillbirth rate was found to be 29.71 /1000 births. Among 171 stillbirths 77(45%) cases were registered cases and 94 (55%) were unregistered cases. The majority of the study population from urban area belonging to class 3 socio economic status as per Kuppuswamy socio economic classification system, 51 (29.82%) and class 3 socio economic status as per Modified BG Prasad socio economic classification system 36,(21.05%). Stillbirths were more common in the age group of 20-30 years with the incidence rate of 152(89%). Incidence of stillbirth was common in primipara 78 (45.61%), followed by second para 43(25.14%), Third para 32(18.71) and ≥4 th para 18 (10.52%). Stillbirth were more common in the gestational age of 28 weeks 1 day to 36 weeks 6 days, 90 (52.63%) in the present study. Most of the stillbirth were in antenatal period 156(91.22%).15 (8.77%) of stillbirth were in intrapartum period.136 (80%) stillbirth were delivered vaginally and 35(20%) were delivered through caesarean section. In the present study the most common causes of stillbirth were hypertensive disorders of pregnancy 33(19.29%), FGR (17.54%), Abruption (15.78%), congenital malformation (14.61%) and unknown (9.35%). Other causes were prelabor rupture of membranes (8.76%), Gestational diabetes mellitus (3.50%), non immune hydrops (2.92%).

CONCLUSION

Stillbirth rates are considered as an important indicator of the quality of obstetric care available in a country. According to the global figures 2015, Indian ranks first in the absolute number of stillbirth.

In our study rate was 2.97% of stillbirth. To bring down these high rates of stillbirth, we should be aware of prevalence rates and risk factors leading to stillbirths and then plan strategies which are appropriate and tailor made to suit our local situation.

Early identification of the these risk factors will lead to timely identification of appropriate preventive and interventional strategies which will help us to improve the overall pregnancy outcome such as stillbirths which have an adverse impact on life the woman and her family.

Keyword: Stillbirth

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INTRODUCTION

In the latter months of pregnancy, the disappearance of foetal movements usually directs the attention of the patient to the possibility of foetal death. The diagnosis of this condition, however, can be considered absolute only after repeated examinations, when one has failed to hear the foetal heart or perceive the movements of the child

—J. Whitridge Williams (1903)

Stillbirth still remains the most prevalent adverse outcome of pregnancy. Worldwide in 2015, for every 1000 total births, 18.4 babies were stillborn, mostly in low- and middle-income countries[1].

Stillbirth is a global issue historically misunderstood and under-acknowledged. Death of a viable fetus is one of the unhappy events in the field of obstetrics. It is a distressing adverse outcome to both parents and obstetrician.

Stillbirth is a sensitive indicator for maternal care during antenatal and intra partum period. It also reflects the obstetrician's vigilant care during pregnancy. Thus it is important to identify the probable causes and risk factors associated with fetal loss to determine the risk of recurrences, prevention and to plan a strategy for its correction. Strong parent and care provider partnerships are needed to dispel misperceptions and negative attitudes that persist in communities.

Determining the cause of stillbirth has been historically challenging, as the fetus is not directly observed when death occurs and the events prior to fetal demise are often unclear. Determining the causes of stillbirth helps in maternal coping, permits more accurate counselling regarding recurrence in the next pregnancy and may prompt therapy or interventions to prevent similar implications.

The increased focus on stillbirth-related issues in recent years has brought several previously neglected issues 'out of the blues' and has highlighted the need for greater preventive efforts and better care for bereaved mothers and families.

Though there has been a renewed global focus on stillbirth as a public health concern, still the decline in stillbirth rates has remained static in the developed countries. Stillbirths comprise a large proportion of preventable deaths. Many women and children die in pregnancy and childbirth including the estimated 2·6 million third trimester stillbirths worldwide.

The burden of stillbirths is overlooked many a times. Interventions to reduce this burden should include intentional leadership; increased voice, especially of women; implementation of integrated interventions with commensurate investment; indicators to measure effect of interventions and especially to monitor progress; and investigation of critical knowledge gaps[2].

Stillbirth rates have declined more slowly since 2000 as compared to both maternal mortality and mortality in children younger than 5 years. Better data is essential to accelerate progress towards the target of 12 or fewer stillbirths per 1000 births in every country by 2030.[3]

Good quality care during labour and birth gives an opportunity in preventing stillbirth. Improved quality of antenatal care and family planning are also important to maximise maternal and fetal wellbeing. Furthermore there is research gap in the understanding of conditions and contexts within which stillbirths occur.[4, 5]

There must be improvement in the quality of data to identify the causes of stillbirth. By assigning the cause and counting each of the stillbirths we can predict and prevent the stillbirth in the next pregnancy.

Stillbirths have been neglected in worldwide data tracking, social recognition, and also in investment and programmatic action. The burden on families, especially women, is very severe and long lasting, yet stigma and taboo hides this burden even in high-income countries.[6]

The agony of stillbirth affects women, families, caregivers, communities, and society. Parents experience various psychological symptoms that often persist long after the death of their baby but could be mitigated by respectful maternity services, including bereavement care.

Most stillbirths are preventable with health system improvements. High quality antenatal and intra partum care within the continuum of care for women and children results in preventing maternal and newborn deaths and stillbirths and also improves child development. The stillbirth rate is a sensitive marker of quality and equity of health care.[7]

One of the approaches to reduce stillbirths is to identify the factors that are associated with stillbirth and this study was undertaken with the objective to know the risk factors associated with the stillbirths and their association with the stillbirth.

OBJECTIVE

- To know the association between maternal and fetal risk factors and stillbirths.

REVIEW OF LITERATURE

Stillbirth is the most sensitive indicator of maternal and child health care. Stillbirth in developing countries is three to five fold higher as compared to developed countries. Stillbirth incidence in present scenario in our study area is 2.6%[8]. Stillbirths generally account to one half of all the perinatal deaths, with an estimated four million occurring worldwide each year. More than 97% of these stillbirths take place in developing countries.

Stillbirths have been understudied, under reported and rarely been considered in attempts to improve adverse pregnancy outcomes in developing countries.

Although the WHO has attempted to standardize the definition of stillbirth by recommending 1000 gm as the lower limit for international comparisons (corresponding to approximately 28 weeks of gestation), the lower limit of gestational age and birth weight varied widely.

In developed countries, stillbirth has been defined as fetal loss beyond 20 weeks of gestation. However some developed countries (such as Sweden) use 28 weeks of gestation as the lower cut-off. In developing countries, gestational age of 28 weeks or birth weight of less than or equal to 1000 grams is often used as the lower cut-off.

The timing of still birth in relation to delivery also varies. The stillbirths that occur more than 12 hours before delivery have skin that is macerated (macerated still birth) and those stillbirths that occur in intra partum period or immediately before delivery are called fresh stillbirths.

Antepartum stillbirths occur due to combination of severe maternal, placental and fetal abnormalities. It includes umbilical cord complications, severe pre-eclampsia, severe intrauterine growth restriction, abruptio placentae and infections. There are various recognized risk factors for antepartum stillbirths like advanced maternal age, high parity, maternal smoking and obesity.

Intra partum fetal death usually results from fetal distress and/or obstructed labour and often reflects poor access or poor quality of clinical care during delivery. In developed countries, the majority of stillbirths occur before the onset of labour, but this proportion is low in developing countries may be due to under reporting of cases.

When intra partum stillbirths occur, they represent inadequate access to or poor quality of essential obstetric care. Much is still unknown about the prevalence, timing and circumstance that are associated with stillbirths in developing countries, where a significant number of deliveries occur at home though the scenario is changing fast with promotion of institutional delivery by the virtue of numerous Government schemes.

Data on stillbirths are not collected routinely in many countries and hence most of the stillbirth research is hospital based. Therefore understanding the burden of stillbirth has an important implication on health planning and resources, which are of particular concern in very low resource countries.

An observational study conducted in Belagavi during the period of 2008-2009 concluded that the common primary obstetric causes of stillbirth were spontaneous preterm delivery and hypertensive disorders .Other causes included antepartum haemorrhage, multiple pregnancy, intra partum asphyxia, fetal abnormality and

maternal diseases. Preterm birth, sepsis, birth asphyxia and congenital malformations are the main cause of deaths in newborn babies worldwide.[9]

As per a clinical observational study conducted during January 2011- to October 2011 in Loni, Ahmednagar, India pregnancy induced hypertension was the leading cause of stillbirth. Other causes were prematurity, antepartum haemorrhage, cord accidents, fetal malformations, postdatism, malpresentations, labour abnormalities, medical disorders (anemia, heart disease, liver disease etc) and idiopathic. This Study concluded that the high rate of ante partum stillbirths were due to hypertension ,ante partum hemorrhage and preterm labour .Authors recommended that early recognition of the problem ,regular antenatal check ups ,color Doppler study to diagnose fetal growth restriction ,ultrasonograpy to diagnose cord abnormalities ,use of intra partum electronic fetal monitoring, partograph and prevention of prolongation of second stage of labour will help in reduction of stillbirths. [10]

A retrospective observational study at Fernandez Hospital, Hyderabad, India which included the analysis of 436 stillbirths out of 40,374 singleton births from 24weeks of gestation, delivered during 2010 to 2015 revealed Incidence of stillbirth was 10.79% . Multivariate analysis showed that referred women with fetal growth restriction, antepartum haemorrhage and acute fatty liver of pregnancy, were found to be significant causative factors. [11]They concluded that the leading causes of stillbirth were fetal growth restriction and hypertensive disorders in pregnancy. Identification of risk factors, improving detection of fetal growth restriction, appropriate and timely intervention in pre-eclampsia may reduce stillbirths. [11]

A population based study in England during 2009-2011 to assess the main risk factors associated with stillbirth in a multiethnic English maternity population identified a significant risk of stillbirth for parity (para 0 and para ≥3), ethnicity (African, African-Caribbean, Indian, and Pakistani), maternal obesity (body mass index ≥30), smoking, pre-existing diabetes, history of mental health problems, antepartum haemorrhage, and fetal growth restriction (birth weight below 10th customised birth weight centile).[12] The study concluded that most of the stillbirths were potentially avoidable. The single largest risk factor was unrecognised fetal growth restriction and recommended preventive strategies to focus on improving early antenatal detection.[12]

One year observational study at The Department of Obstetrics and Gynecology, King George Medical University, Lucknow, Uttar Pradesh, India showed that cause of intrapartum stillbirth which was statistically significant correlated with patient's place of residence (rural>urban), distance of health centre from her house, time taken to reach first point of contact and her parity. The major obstetrical causes of stillbirth identified were APH (22.36%), hypertensive disorders of pregnancy (19.27%), IUGR (15.27%), unexplained causes (11.09%), malpresentations (9.64%), rupture uterus(9.09%)and obstructed labour (6.36%). Severe anemia was found in 24.91% of cases as an associated obstetrical cause of stillbirth.[13]

The above mentioned study concluded that the rate of stillbirth was higher as compared to the Indian data (22/1000 total births). Antepartum obstetric complications (APH, hypertensive disorders of pregnancy, IUGR) were the most common cause. 15.45% of cases showed intra partum causes of stillbirth (obstructed

labour and rupture uterus) which was significantly higher than developed countries where such cases are negligible. The higher number of intra partum deaths indicate that better healthcare services can drastically reduce stillbirth rates in developing countries.[13]

A systematic review of studies reporting factors associated with and causes of stillbirth in low- and middle-income countries (2000–13) reported that the factors to be associated with stillbirth were poverty ,lack of education, maternal age (>35 or <20 years), parity (1, ≥5), lack of antenatal care, prematurity, low birth weight, and previous stillbirth. The most frequently reported cause of stillbirth was maternal factors including syphilis, positive HIV status with low CD4 count, malaria and diabetes. Congenital anomalies accounted for 2.1–33.3% , placental causes for 7.4–42% , asphyxia and birth trauma for 3.1–25% , umbilical problems for 2.9–33.3% and amniotic and uterine factors for 6.5–10.7% of stillbirths[14].They concluded that to build capacity for perinatal death audit, clear guidelines and a suitable classification system to assign cause of death must be developed. Existing classification systems may need to be adapted. Better data and more data are urgently needed.[14]

A study using Capture and recapture method to identify the causes of 301 stillbirths from 1st July 2013 to 31st August 2014 in Chandigarh Union Territory of India showed that major causes and risk factors amenable to interventions were infections, hypertension, congenital malformations, fetal growth restriction and pre-maturity .Therefore, better ante-natal and intra-natal care is required to achieve a single digit stillbirth rate.[15]

Analysis of a nationwide perinatal database, 2013–2014 in Japan to find out causes and risk factors for singleton stillbirth concluded that stillbirths occurring

among women with known complications were likely to be prevented, at least in secondary and tertiary facilities. Further reduction in stillbirths must target fetal growth restriction. Improvement in postpartum investigation and recording of the causal pathways of stillbirths may enable to explain some of the stillbirths with unknown cause of death, and to continue to make progress in reducing this tragic pregnancy complication.[16]

METHODOLOGY

Method of collection of data:

A descriptive observational study is undertaken in labour room at KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belgaum. The cases of intra-uterine fetal death either with ultrasound reports proving IUD and diagnosed on clinical examination by absence of fetal heart rate.

Period of study: From January 2017 to December 2017

Inclusion criteria:

All stillbiths ($\geq$ 20weeks of pregnancy or$\geq$ 500gms of the fetus) [(ACOG 2009) 17]

Exclusion criteria:

Women not giving consent for the study.

Procedure of Study:

All the cases of intra-uterine fetal death which come to KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, the during the study period were included. All the patients included in the study were analysed in terms of the age, parity, literacy and socio-economic status (as per 2016 Kuppuswamy for urban population and 2016 May Modified BG Prasad For rural population), Detailed obstetric history, details about present complaints, duration of present pregnancy, past obstetric performances and outcomes (including previous abortions, previous IUFD, associated complications, etc.,) are studied. In the present pregnancy details of ante-natal check-ups, medical illness, presence of antepartum hemorrhage, pregnancy induced hypertension, eclampsia, severe anemia and other significant illness are noted.

Complete general physical examination/systemic examination and per abdomen antenatal examination was done. Absent FHS is noted and confirmed with ultrasonography.

Mode of delivery and birth weights of fetuses noted. All the fetuses are examined for any malformations and each placenta checked for its appearance, weight, retro-placental clot/infarcts and calcification.

STATISTICAL ANALYSIS:

Data was entered in Microsoft 2010 Excel sheet. Obtained data was tabulated and analysed using rates, ratios and percentages.

Chi-Square Test is applied for each of the risk factor to know its association with stillbirth. Risk associated with factors estimated using Odds ratio. P value $\leq .005$ is considered significant.

RESULTS

During the study period between January 2017-December 2017, there were total 5755 deliveries and 171 stillbirths. Data was entered in Microsoft 2010 excel sheet. The data obtained was tabulated and analysed using rates, ratios and percentages .Association in the risk factor and stillbirth calculated with chi square test. P value calculated for the risk factors.

Table 1: Total No .of deliveries and stillbirths

Total No. of deliveries	**5755(100%)**
Total No. of live births	**5584(97.02%)**
Total No. of the stillbirth S	**171(2.97%)**

Table 1 shows the total number of deliveries in the study period were 5755.Among these stillbirths were 171 and live births were 5584.

Table 2: Incidence of Stillbirth.

Total No. of stillbiths	**171**
Incidence of Stillbirth	**2.97%**
Still birth rate	**29.71/1000 births**

Table 2 shows the incidence of stillbirth was found to be 2.97% and stillbirth rate was found to be 29.71 /1000 births.

Table 3: Number of stillbirths in registered and Un-registered cases

Registration	Total Number	Percentage
Unregistered	94	54.97%
Registered	77	45.02%

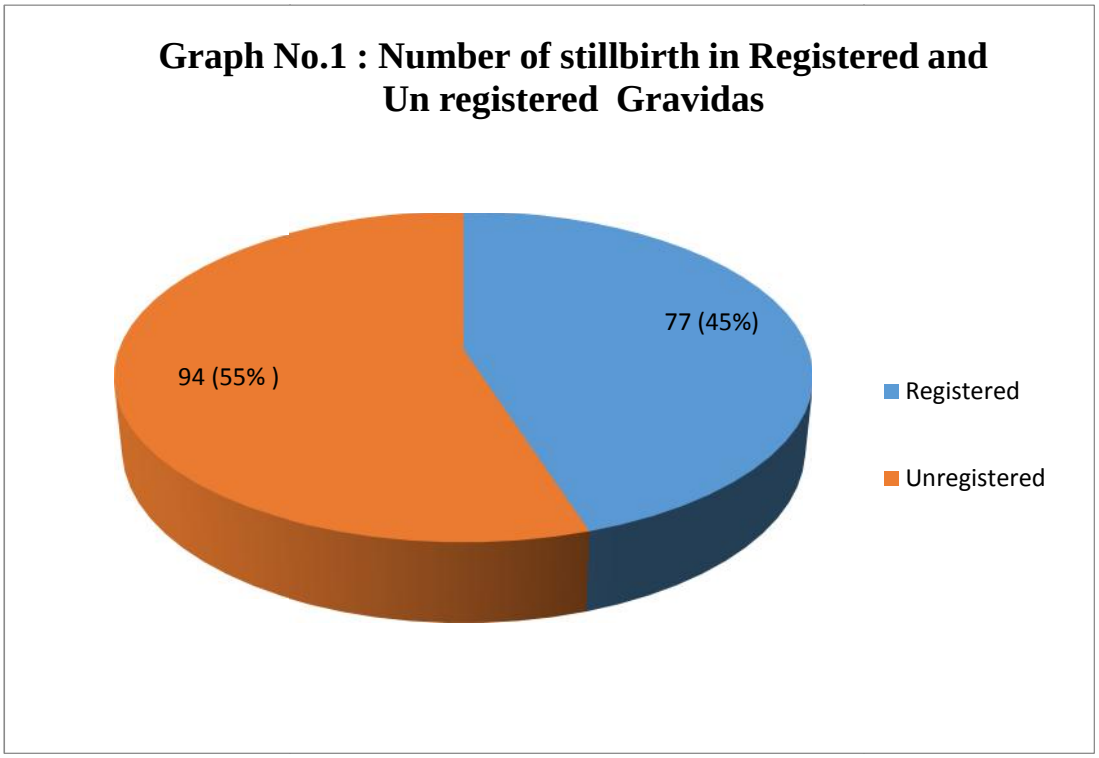

Table 3 depicts that the number of registered and unregistered gravidas among the study population. Among 171 stillbirths 77(45%) cases were registered cases and 94 (55%) were unregistered cases.

Table 4: Number of stillbirth according to Kuppuswamy Socio Economic Status (For Urban population) (n= 83)

Class	No. of Cases	Percentage
K1	1	0.58%
K2	14	8.18%
K3	51	29.82%
K4	13	7.60%
K5	4	2.33%

Table 4 shows that majority of the study population from urban area belong to class 3 51 (29.82%) socio economic status as per Kuppuswamy Socio Economic classification system.

Table 5: Number of stillbirth according to Modified BG Prasad Socio Economic Status (Rural population)(n=88)

Class	Total Cases	Percentage
R1	**0**	**0**
R2	**22**	**12.86%**
R3	**36**	**21.05%**
R4	**26**	**15.20%**
R5	**4**	**2.33%**

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Table 5 depicits that majority of the study population from rural area belong to class 3 36(21.05%) socio economic status as per Modified BG Prasad Socio Economic classification system.

Table 6: Number of stillbirth according to maternal age

Age in years	Total number	percentage
< 20	6	3.5%
20-30	152	88.8%
30-35	13	7.6%

Graph No . 2 Number of stillbirth according Maternal age

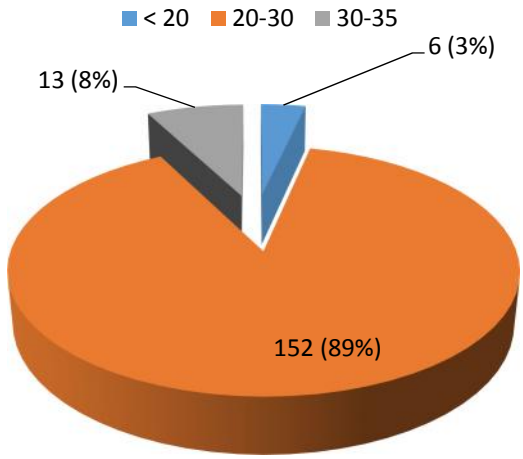

Table 6 shows the incidence of stillbirth according to maternal age. Stillbirths were more common in the age group of 20-30 years 152(88.8%)

Table 7: Number of stillbirth according to parity

Parity	TOTAL NUMBER	PERCENTAGE
Primipara	**78**	**45.61%**
Para2	**43**	**25.14%**
Para 3	**32**	**18,71%**
>/= Para 4	**18**	**10.52%**

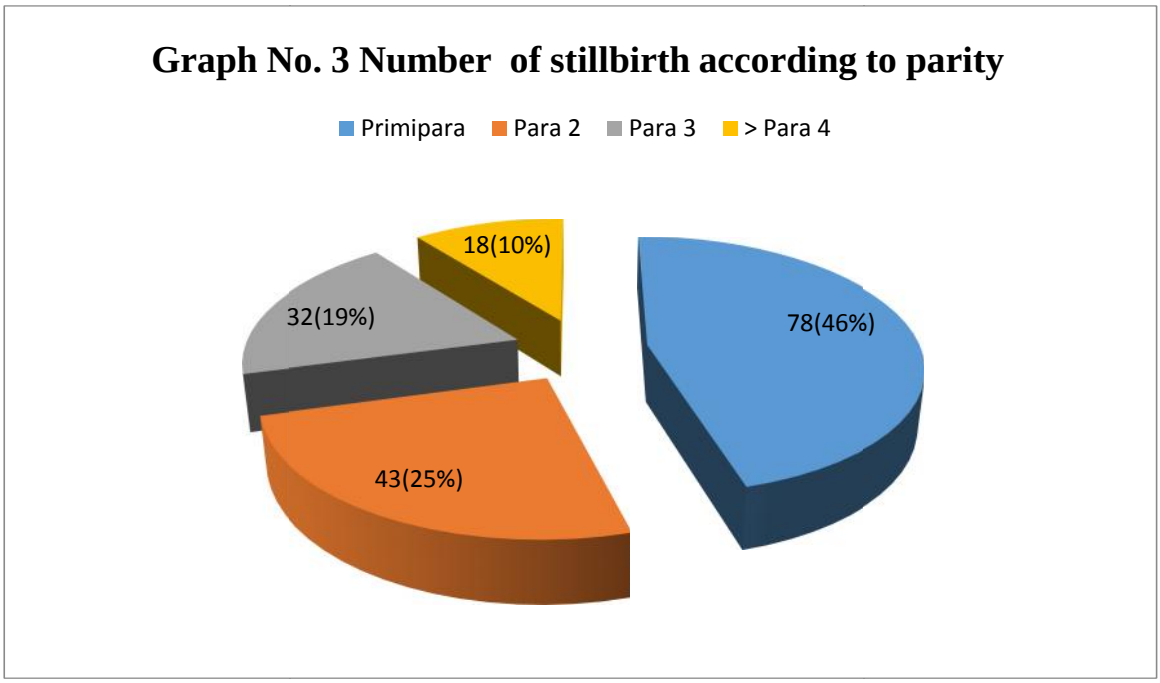

Table 6 shows that the stillbirths were common in primipara 78 (45.61%), followed by para2 43(25.14%), para 3 32(18.71) and _para 4 18 (10.52%)

Table 8: Number of stillbirth according to gestational age

Gestational age in weeks	Total numbers	Percentage
20-28	45	26.31%
28 wk 1 day – 36 wks 6 days	90	52.63%
37- 41 wks	34	19.88%
>41 wks	2	1.16%

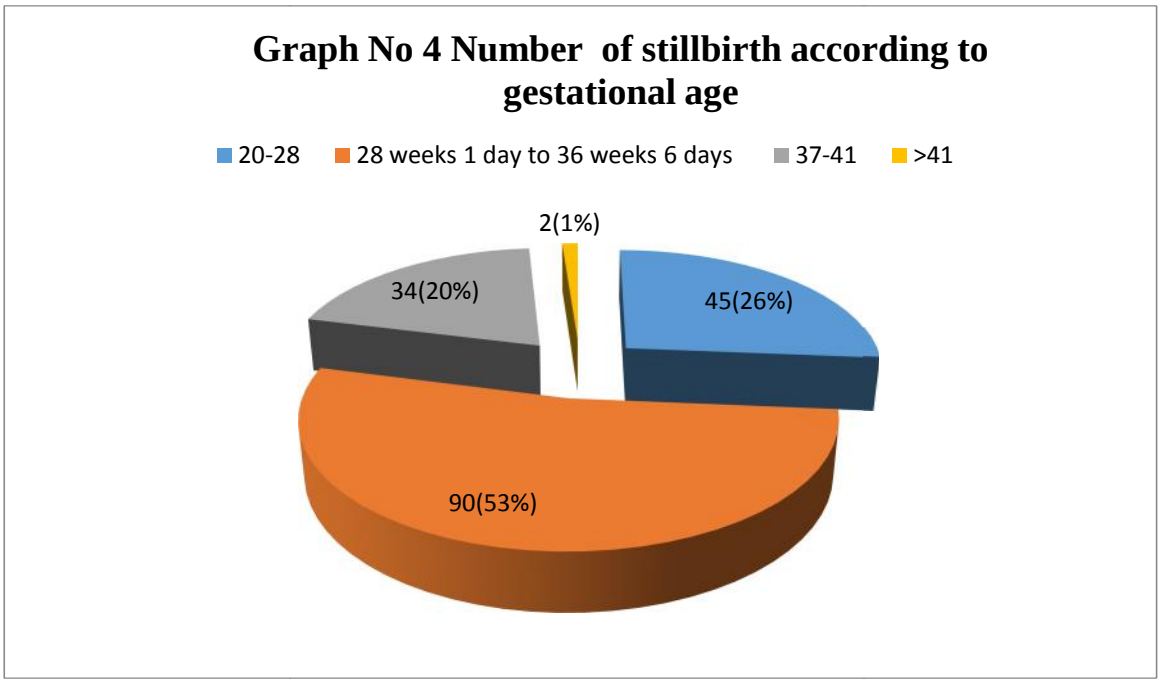

Table 8 shows that stillbirth were more common in the gestational age of 28 weeks 1 day to 36 weeks 6 days, 90 cases (52.63%) in the present study. 45(26.31%) cases were between 20 weeks to 28 weeks period of gestation ,34 (19.88%) cases were between 37 to 41 weeks period o gestation and 2(1.16%) cases were more than 41 weeks of gestation.

Table 9: Number of stillbirth according to time of fetal demise

Type	Total Cases	Percentage
Antepartum Death	**156**	**91.22**
Intrapartum Death	**15**	**8.77%**

Graph No. 5 Number of stillbirth according to time of fetal demise

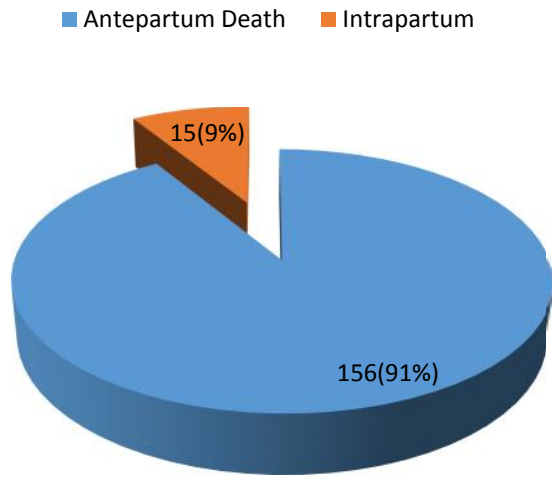

Table 9 shows that 156(91.22%) stillbirths were noticed in the antenatal period and 15 (8.77) stillbirths were noted in the intra partum period.

Table 10: Number of stillbirth according to nature of stillbirth (n=171)

Type of Stillbirth	Total Number	Percentage
Fresh stillbirth	102	59.64%
Macerated stillbirth	69	40.35%

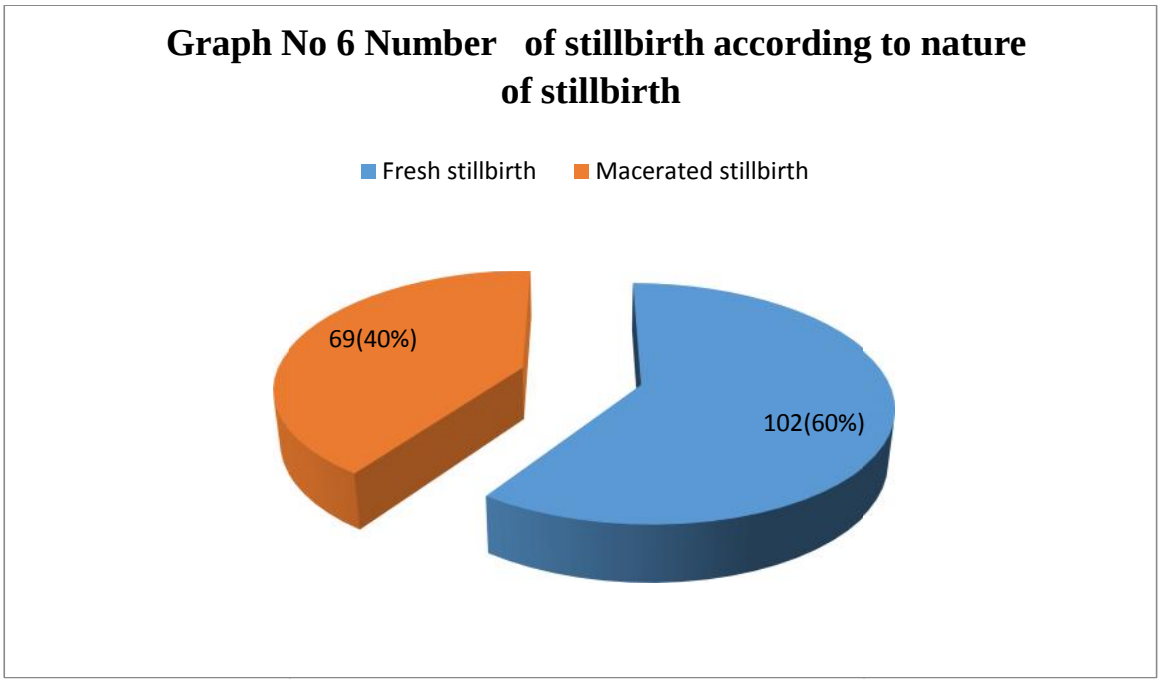

Table 10 depicts that out of 171 cases, 102 were fresh still births (59.64%) and 69(40.35%) were macerated stillbirths.

Table 11: Number of stillbirth according to mode of delivery

Mode of delivery	Total Number	Percentage
Vaginal	**136**	**79.53%**
Cesarean	**35**	**20.46%**

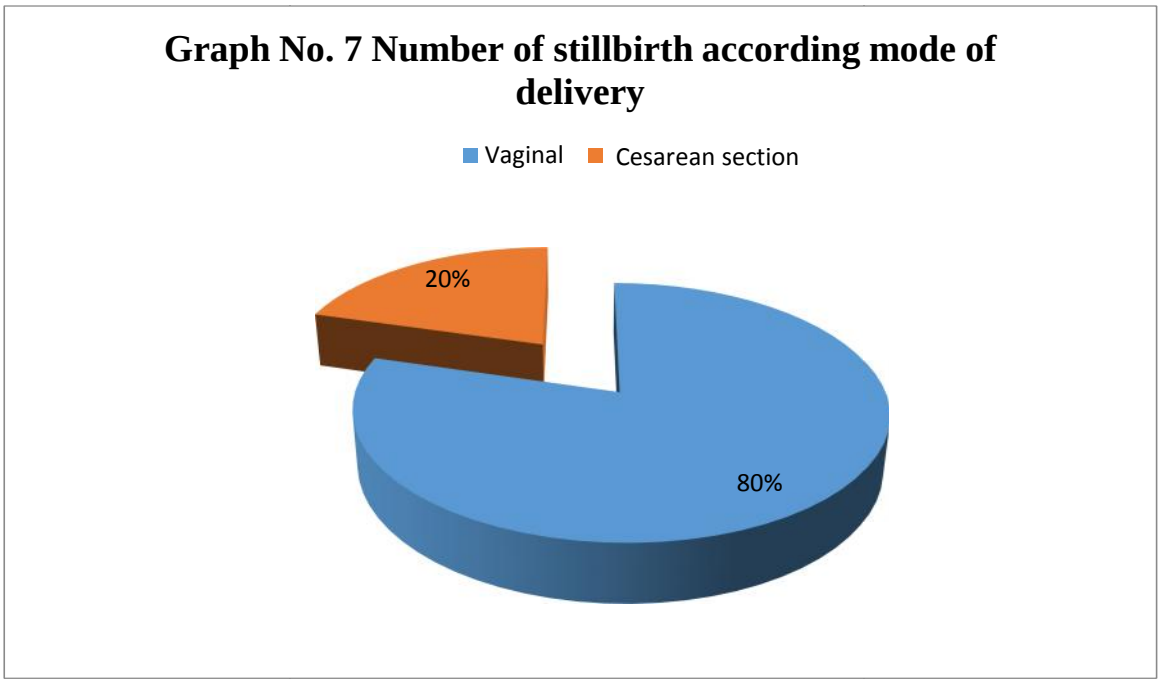

Table 11 shows that 136 (80%) were delivered vaginally and 35(20%) were delivered through C section.

Table 12: FHR Status in the patient admitted tp labor room

Cardiac activity	Present	absent
No of cases	17	154
Percentage	9.9%	90.1%

Graph No. 8: FHR Status in the patient admitted tp labor room

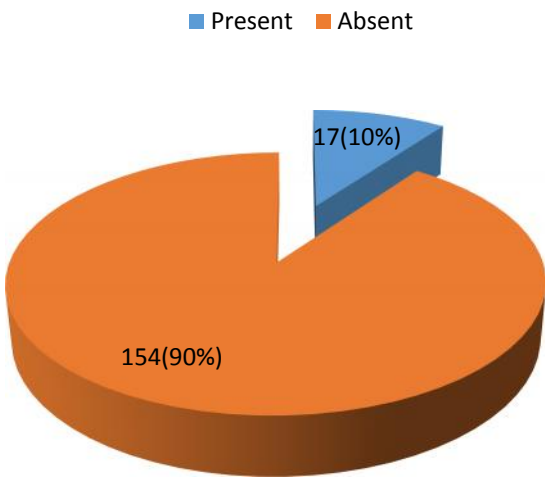

Table 12 shows that, in 154 cases FHR was absent on admission on admission to labour room and 17 cases FHR was absent later during the course of labour.

Table 13: Causes of stillbirth

Principle Cause	Total Cases	Percentage
Hypertensive disorders of pregnancy	33	19.29%
FGR	30	17.54%
Abruption	27	15.78%
Congenital Malformation	25	14.61%
Unknown	20	11.69%
PROM	15	8.76%
GDM	06	3.50%
Non Immune Hydrops	05	2.92%
Birth Asphyxia	03	1.75%
Cord Accidents	03	1.75%
Maternal Infection(Toxoplasma and Cytomegalovisus)	02	1.16%
Uterine rupture	01	0.58%
Overt Diabetes	01	0.58%

In the present study the most common causes of stillbirth were hypertensive disorders of pregnancy, 33(19.29%), FGR(17.54%) followed by abruption (15.78%), congenital malformation (14.61%) and unknown (11.69%).Other causes were prelabor rupture of membranes (8.76%), Gestational diabetes mellitus (3.50%), non immune hydrops (2.92%).

Table 14: Association of stillbirth with risk factors

Principle Cause	Total No of cases	P Value	95% Confidence Interval	
Hypertensive disorders of pregnancy	33	.0105	.766	3.669
Abruption	27	.605	.489	3.409
Oligohydramnios	30	.001		
Anemia	77	.023		
Preterm delivery	15	.051		
Premature rupture of membranes	15	.625	1.152	1.333
FGR	30	.010	.235	1.470
meconium stained liquor	02	.007	.061	.721
DM	01	.596	.177	2.713
Congenital Malformations	25	.040	.137	.256
Maternal Infection	02	.040	.137	.256
Unknown	20	.049		

In the present study risk factors such as , hypertensive disorderes of pregnancy oligohydramnios, FGR , anemia, meconium stained liquor, congenital malformation and maternal infection were significantly (p value $\leq$.05) associated with stillbirth. Factors such as abruption, preterm delivery, premature rupture of membranes, diabetes, were not significant.

DISCUSSION

The stillbirth rate varies worldwide among different countries and in the different regions of the same country. The current stillbirth rate worldwide in low and middle income countries is 18.4 per 1000 total births.[1] The current stillbirth rate in India is 22 per 1000 birth with variation of 22 to 66 per 1000 births in different states[11]. In this study, the incidence of stillbirth was found to be 29.71 per 1000 live briths. It is low compared to the other Indian studies, 78.3 per 1000 births (Kothiyal S et al.[13]), 57.9 per 1000 birth (Prasanna N et al.[18]), 43 per 1000 births (Bellad et al.[9]). The comparative low rate found in the present study can due to low intra partum stillbirth rate, a quality indicator of intrapartum monitoring of high risk pregnancy by the health care professional available round the clock.

Women who had minimum 3 visits for antenatal check-up in our institute were considered as registered cases. There were 77(45.02%) stillbirths in registered cases and 94(54.98%) in unregistered cases. In this study, it was found that stillbirth were more in unregistered cases as compared to registered cases. This was comparable with other study like Rajagoal VM et al.[19] (unregistered 54.4%, registered 45.5%). Good antenatal care, efficient protocol based management explains the low mortality in registered cases whereas in unregistered cases who had come as obstetric emergency, late referral to tertiary care hospital can be a cause for the poor outcome and more stillbirth rate in this group.

Majority of the stillbirths 88(51.46%) were found in women from rural population as compared to the urban population 83(48.53%). Comparative high rate of mortality in rural population suggest the need for improved obstetric care as well as availability of emergency services in the rural set up also.

This study revealed that most of the pregnant women who had stillbirth were from middle, low middle and low socio-economic status (class 3,4,and 5 as per both Kuppuswamy and modified BG Prasad Classification) with rate of 134 (78.33%). This result is very similar to Kumari C et al[20]. (84.2%), and Asalkar MR et al.[21] (89.061%). The socio-economic status influences the pregnancy outcome and determines health seeking behaviour of the women.

In this study , majority of the stillbirths152(88.8%) were in the women between the age group of 20-30 years of age which was similar to a study done by Balu et al. [22](80%) and Rajagoal VM et al.[19] (71.4%). Though advanced maternal age is known risk factor for both increased perinatal morbidity and mortality, in this study it was not found to be significant statistically.

In the present study stillbirths were more in the multigravida 93(54%) collectively, when compared to primigravida 78(45%) but primipara as an individual group was the major group. The relationship between parity and incidence of the stillbirth similar to the other studies i.e., Vaishali N. et al.[23] (primigravida 48.3%, multigravida 51.6%), Lucy D. et al.[24] (primigravida 48.8%, multigravida 51.69%).

As gestational age based definition of the stillbirth is better predictor of mortality than birth weight based definition. We have categorized stillbirth according to gestational age. In this study, almost 90(53%) of the stillbirth were between the 28 weeks to 36 weeks 6 days of gestational age. One fourth of stillbirth, 45(26.31%) were between the gestational age of 20-28 weeks. High rate of stillbirths, between 28 weeks to 36 weeks 6 days are similar to other studies like Devi KS, Aziz N, et al. [11] (57%), Agbata , et al.[25] (81%), Rajagoal VM et al.[19] (75%). More prevalence of major causes of stillbirths like preeclampsia, fetal growth restriction, preterm rupture

of membranes, antepartum haemorrhage, and preterm delivery in this gestational age explains the probable high rate of stillbirth in this group.

Stillbirths were broadly classified into intrapartum and antepartum. This classification not only helps in understanding the cause but also aids in planning the interventions required to avoid the intrauterine fetal demise, both in antepartum and intrapartum period. This will help in achieving single digit stillbirth target. In this study intrapartum deaths were 15 (9%) and antepartum deaths were 156(91%). Intrapartum stillbirth rate in the present study was comparable with other studies like Rajagoal VM et al.[19] (15%), Prasanna et al[18] (12.1%). Lawn et al[26] have estimated that intrapartum stillbirth rate to be 39% in middle income countries. Low intrapartum stillbirth rate in this study reflected a good intrapartum care, close monitoring of the patient during labor, use of partograph in active labor, availability of operation theatre near the labor room and continuous monitoring of progress of labor by skilled personnel. For reducing antepartum stillbirth, the quality of antepartum care should be improved as complications during antepartum period are often associated with poor outcome of pregnancy.

All stillbirths were examined at the time of the delivery .In this study it was found that 102(59.64%) stillbirths were fresh stillbirths and 69(40.35%) were macerated stillbirth. It was comparable to the other studies conducted by Agbata, et al.[25], Rajagoal VM et al.[19] and Alhassan et al.[27] fresh stillbirths constituted 57.1%, 51.7% and 56.7 % respectively. As our institution is a tertiary care centre the high proportion of fresh stillbirth resulted from late referral of obstetric emergencies, like severe preeclampsia, fetal growth restriction with Doppler changes and antepartum haemorrhage in labor.

Fresh stillbirth was defined as fetal death within 12 hours of delivery with intact skin and fetal death more than 12 hours with discoloured , peeled off skin and darkly stained liquor and umbilical cord was considered as macerated stillbirth[28]. This method has been validated for the estimating the time of the fetal death[29].

Vaginal delivery rate among the stillbirth in this study was136 (79.53%).It was comparable to other Indian studies like Rajagoal VM et al.[19] (90%), Newtonraj et al.[15] (96.7%).Women with stillbirth usually deliver by vaginal route unless there is a contraindication. Once a stillbirth is diagnosed, there is a high chance for induction of labor to terminate pregnancy and avoid complications as vaginal route is preferred over caesarean section in stillbirth deliveries. Caesarean section may be indicated for maternal indications in cases such as abruptio placenta.

Major causes for stillbirth in the present study included hypertensive disorders of pregnancy 33(19.29%), fetal growth restriction 30(17.54%), abruption 27(15.78%), congenital malformation 25 (14.61%), Unknown 20 (11.69%), premature rupture of membranes 15 (8.76%). Similar high rates for the causes were found in study conducted by Rajagoal VM et al.[19] (fetal growth restriction 25%, hypertension 25%) and Devi KS, Aziz N, et al. [11] (preeclampsia 39%, antepartum haemorrhage 10.6%, fetal growth restriction 28.2%, congenital malformation 3.66%, unknown 12.8%).

Hypertensive disorders of pregnancy were associated significantly with stillbirth rate in this study (p value .0105). Significant association of the stillbirth with maternal hypertension was also noticed in many studies conducted in India, Pakistan, Brazil and other countries.[30,31,32,33] . Fetal growth restriction was also significantly associated with stillbirth rate (p value .010). like other studies[34,35]. Among stillbirths associated with fetal growth restriction, majority were referred cases. It means that

considering the gestational age and birth weight, these babies would have been salvaged if the growth restriction was detected in antenatal period , put on antepartum fetal surveillance and delivered in time.

Preterm delivery carried the high risk of intrapartum death, similar to other studies.[36,37,38] i.e., 8.14% in Perihar et al.[39] study. Congenital malformations in fetus were significantly associated with stillbirth14.61% (p value.040). It was seen that most of the lethal anomalies were detected late in the pregnancy. So timely anomaly scan at or before 20 weeks of gestation is highly recommended in order to detect lethal congenital anomaly early in the gestation, so that such pregnancies are terminated before age of viability under the of MTP act. This will significantly reduce number of stillbirth.

Abruption is a known risk factor for stillbirth 27(15.78%) in all gestational age i.e., 18% in Frets et al.[40] . As abruption is commonly associated with hypertensive disorders of pregnancy, timely intervention in the management of preeclampsia may reduce morbidity and mortality associated with abruption. There is need to formulate standard practice guidelines in the management of preeclampsia to reduce burden of stillbirth rate associated with hypertensive disorders of pregnancy.

Unknown causes for stillbirth, were found to be in 10% of cases. These are unexplainable factors as there are limitations in doing the fetal autopsy fetal karyotyping and placental histopathological examination in stillbirths. Unwillingness by parents was found due to financial and social factors.

Maternal infections like (Toxoplasma and Cytomegalo virus) were significantly associated with stillbirth (p value .040). Other significant association was also seen with maternal anaemia (p value .023).

Limitations of the study-There are some limitations to this study. As Dr. Prabhakar Kore charitable hospital is a tertiary care hospital, it receives referrals of stillbirths and this has contributed to high stillbirth rate. Unknown were not investigated properly in the form fetal autopsy, placental examination, karyotyping. Demographic characters should have been studied more precisely.

CONCLUSIONS

Stillbirth rates are considered as an important indicator of the quality of obstetric care available in a country. According to the global figures 2015, Indian ranks first in the absolute number of stillbirth.

In our study stillbirth rate was 2.97%. To bring down these high rates of stillbirth, we should be aware of prevalence rates and risk factors leading to stillbirths and then plan strategies which are appropriate and tailor made to suit our local situation.

Early identification of the these risk factors will lead to timely identification of appropriate preventive and interventional strategies which will help us to improve the overall pregnancy outcome such as stillbirths which have an adverse impact on life the woman and her family.

SUMMARY

The present one year observational study was conducted from 1st January 2017 to 31st December 2017 in the labour room of KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belgaum.

Total of 171 stillbirth fulfilling the inclusion criteria were included in the study. Data was obtained by detailed history and examination.

The incidence of stillbirth in the present was found to be 2.97% and stillbirth rate was found to be 29.71 /1000 births. Among 171 stillbirths 77(45%) cases were registered cases and 94 (55%) were unregistered cases.

The majority of the study population from urban area belong to class 3 socio economic status as per Kuppuswamy Socio Economic classification system ,51 (29.82%) and class 3 socio economic status as per Modified BG Prasad Socio Economic classification system 36(21.05%).

Stillbirths were more common in the age group of 20-30 years with the incidence rate of 89%. Incidence of stillbirth was common in primipara 78 (45.61%), followed by second para (25.14%), Third para (18.71) and ≥4 th para (10.52%). Stillbirth were more common in the gestational age of 28 weeks 1 day to 36 weeks 6 days, 90 cases (52.63%) in the present study.

Most of the stillbirth were in antenatal period (91.22%).8.77% of stillbirth were in intrapartum period.136 (80%) stillbirth were delivered vaginally and 35(20%) were delivered through caesarean section.

In the present study the most common causes of stillbirth were hypertensive disorders of pregnancy, 33(19.29%), FGR(17.54%) followed by abruption (15.78%), congenital malformation (14.61%) and unknown (11.69%).Other causes were

prelabor rupture of membranes (8.76%), Gestational diabetes mellitus (3.50%), non immune hydrops (2.92%).

Risk factors such as, hypertensive disorderes of pregnancy oligohydramnios, FGR, anemia, meconium stained liquor, congenital malformation and maternal infection were significantly (p value $\leq$.05) associated with stillbirth. Factors such as abruption, preterm delivery, premature rupture of membranes, diabetes, were not significant.

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Early diagnosis and timely intervention of the major causes like pre eclempsia, fetal growth restriction, antepartum haemorrhage and other risk factors may help in reducing the stillbirth rate.

BIBLIOGRAPHY

01: http://www.who.int/reproductive health/topics/maternal perinatal/stillbirth/en/

02: de Bernis L, Kinney MV, Stones W, ten Hoope-Bender P, Vivio D, Leisher SH, Bhutta ZA, Gülmezoglu M, Mathai M, Belizán JM, Franco L. Stillbirths: ending preventable deaths by 2030. The Lancet. 2016 Feb 13;387 (10019):703-16.

03: Lawn JE, Blencowe H, Waiswa P, Amouzou A, Mathers C, Hogan D, Flenady V, Frøen JF, Qureshi ZU, Calderwood C, Shiekh S. Stillbirths: rates, risk factors, and acceleration towards 2030. The Lancet. 2016 Feb 12; 387 (10018) : 587-603.

04: Lawn JE, Blencowe H, Pattinson R, Cousens S, Kumar R, Ibiebele I, et al. Stillbirths: Where? When? Why? How to make the data count? Lancet (London, England). 2011; 377(9775):1448±63. Epub 2011/04/19. https://doi.org/ 10.1016 / s 0140-6736 (10)62187-3 PMID: 21496911.

05: Goldenberg RL, McClure EM, Bhutta ZA, Belizan JM, Reddy UM, Rubens CE, et al. Stillbirths: the vision for 2020. Lancet (London, England). 2011; 377(9779):1798±805. Epub 2011/04/19. https://doi.org/10. 1016/s0140-6736(10)62235-0 PMID: 21496912.

06: Flenady V, Wojcieszek AM, Middleton P, Ellwood D, Erwich JJ, Coory M, Khong TY, Silver RM, Smith GC, Boyle FM, Lawn JE. Stillbirths: recall to action in high-income countries. The Lancet. 2016 Feb 13; 387(10019):691-702.

07: Froen JF, Cacciatore J, McClure EM, Kuti O, Jokhio AH, Islam M, et al. Stillbirths: why they matter. Lancet (London,England). 2011; 377

(9774):1353±66. Epub2 011/04/19. https://doi.org/10.1016/s0140-6736 (10) 62232-5 PMID: 21496915.

08: Vidler M.Maternal and Newborn Health in Karnataka State,India: The Community Level Interventions for Pre-Eclampsia(CLIP)Trial's Baseline Study Results.2017;

09: Bellad MB, Srividhya K, Ranjit K, et al. Factors associated with perinatal mortality: a descriptive observational study. Journal of South Asian Federation of Obstetrics and Gynecology. 2010;2(1):49–51.

10: Bangal Vidyadhar B, Chandaliya Rajiv M, Pandit Hrishikesh A. Review of Socio Demographic Factors And Obstetric Causes Of Stillbirth At Tertiary Care Hospital. ISOR Journal of Pharmacy.2012;2(3):475-478.

11: Devi KS, Aziz N, Gala A, et al. Incidence of stillbirths and risk factors at a tertiary perinatal center in Southern India: retrospective observational study. *Int J Gynecol and Reprod Sci*. (2018); 1(1):14-22.

12: Gardosi J, Madurasinghe V, Williams M, Malik A, Francis A. Maternal and fetal risk factors for stillbirth: population based study. Bmj. 2013 Jan 24; 346:f108..

13: Kothiyal S, Agarwal A, Das V, Pandey A, Agarwal S. Evaluation of causes of still birth in a tertiary care teaching hospital. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2018 Feb 27;7 (3):911-6.

14: Aminu M, Unkels R, Mdegela M, Utz B, Adaji S, Van Den Broek N. Causes of and factors associated with stillbirth in low-and middle-income countries: a

systematic literature review. BJOG: An International Journal of Obstetrics & Gynaecology. 2014 Sep;121:141-53.

15: Newtonraj A, Kaur M, Gupta M, Kumar R. Level, causes, and risk factors of stillbirth: a population-based case control study from Chandigarh, India. BMC pregnancy and childbirth. 2017 Dec; 17(1):371.

16: Rei Haruyama,Stuart Gilmour,Erika Ota,Sarah K. Abe,Md. Mizanur Rahman, Shuhie Nomura, Nouyuki Miyasaka ,Kengi Shibuya.Causes and risk factors for singleton stillbirths in Japan: Analysis of a nationwide perinatal database,2013-2014.Scientic reports (2018) 8;4117/Doi;10.1038/s41598-108-22546-9.

17: American college of obstetricians and gynecologists: Management of stillbirth. Practice bulletin No.102, March 2009:748-761.

18: Prasanna N, Mahadevappa K, Antaratani RC, Lokare L. Cause of death and associated conditions of stillbirths. International Journal of Reproduction, Contraception, Obstetr Gynecol. 2017;4(6):1970-4.

19: Rajagopal VM, Betha K, Priya GS. Classification of stillbirth by relative condition at death (Re Co De) at various trimesters of pregnancy: a rural tertiary teaching hospital based study. Int J Reprod Contracept Obstet Gynecol 2017;6:3550-5.

20: Kumari C, Kadam NN, Kshirsagar A, Shinde A. Intrauterine fetal death: A prospective study. J Obstet Gynecol India. 2001;51(5):94-7.

21: Asalkar MR, Surve M, Dhakne SR, Shivamurthy HM. Review of causes of stillbirths in a rural referral hospital: a cross sectional study. Int J Reprod Contracept Obstet Gynecol 2018;7:3695-701.

22: Balu D, Nayak A, Swarup A. A study of intrauterine fetal death in a tertiary care hospital. Int J Reprod Contracept Obstet Gynecol. 2015; 4:2028-31.

23: Korde Nayak, Vaishali N, Gaikwad Pradeep R. Causes of stillbirth. J Obstet Gynaecol India .2008 Jul/Aug; 58(4):314-318.

24: Das Lucy, Satapathy Umakant, Panda Niharika. Perinatal mortality in a referral hospital of Orissa – A 10 year review. J Obstet Gynaaecol India 2005 Nov/Dec; 55(6):517-20.

25: Agbata AT, Eze JN, Ukaegbe CI, Odio BN. A 4-year retrospective review of stillbirths at the Federal Teaching Hospital, Abakaliki, Southeast Nigeria. Afr J Med Health Sci 2017; 16:19-24.

26: Lawn JE, Blencowe H, Pattinson R, Cousens S, Kumar R, Ibiebele I, et al. Stillbirths: where? When? Why? How to make the data count? Lancet (London, England). 2011;377 (9775):1448–63. doi:10.1016/s0140- 6736(10)62187-3.

27: Alhassan A, Ayikai LA, Alidu H, Yakong VN. Stillbirths and associated factors in a peri-urban District in Ghana. Journal of Medical and Biomedical Sciences. 2016;5 (1):23-31 .

28: Yakoob MY, Lawn JE, Darmstadt GL, Bhutta ZA. Stillbirths: epidemiology, evidence, and priorities for action. In Seminars in perinatology, WB Saunders. 2010; 34:6387-394.

29: Genest DR, Singer DB. Estimating the time of death in stillborn fetuses: III. External fetal examination; a study of 86 stillborn. Obstet Gynecol 1992; 80: 593-600.

30: Singh N, Pandey K, Gupta N, Arya AK, Pratap C, Naik R. A retrospective study of 296 cases of intra uterine fetal deaths at a tertiary care centre. Int J Reprod Contracept Obstet Gynecol 2013; 2:141-6.

31: Nayak S, Garg N. Determinants of antepatum fetal death. J Obstret Gynaecol India 2010; 60:484-97.

32: Huang DY, Usher RH, Kramer MS, Yang H, Morin L, Fretts RC. Determinants of unexplained antepartum deaths. Obstet Gynecol 2000; 95:215-21.

33: Korejor R, Bhutta S, Noormi J. An audit and trends of perinatal mortality at Jinnah Postgraduate medical center, Karachi. J Pak Med Assoc 2007; 57:168-72.

34: Liu LC, Wang YC, Yu MH, Su HY. Major risk factors for stillbirth in different trimesters of pregnancy–a systematic review. Taiwan J Obstet Gynecol. 2014; 53(2):141–5. doi:10.1016/j.tjog.2014.04.003.

35: Kc A, Wrammert J, Ewald U, Clark RB, Gautam J, Baral G, et al. Incidence of intrapartum stillbirth and associated risk factors in tertiary care setting of Nepal: a case-control study. Reprod Health. 2016; 13:103. doi:10.1186/s12978- 016-0226-9.

36: Getahun D, Ananth CV, Kinzler WL. Risk factors for antepartum and intrapartum stillbirth: a population-based study. Am J Obstet Gynecol. 2007; 196(6):499–507.

37: Engmann C, Matendo R, Kinoshita R, Ditekemena J, Moore J, Goldenberg RL, Tshefu A, Carlo WA, McClure EM, Bose C, Wright LL. Stillbirth and early neonatal mortality in rural Central Africa. Int J Gynaecol Obstet. 2009; 105(2):112–7.

38: Lee AC, Mullany LC, Tielsch JM, Katz J, Khatry SK, Leclerq SC, Adhikari RK, Darmstadt GL. Community-based stillbirth rates and risk factors in rural Sarlahi Nepal. Int J Gynaecol Obstet. 2011; 113 (3):199–204.

39: Parihar BC, Goyal A. A study to evaluate the causes of stillbirths according to the ReCoDe classification. Int J Reprod Contracept Obstet Gynecol. 2017; 6:1288-94.

40: Fretts RC. Etiology and prevention of stillbirth. American journal of obstetrics and gynecology. 2005; 193 (6):1923–1935.

ANNEXURE I – ETHICAL CLEARANCE CERTIFICATE

K.L.E.UNIVERSITY'S
JAWAHARLAL NEHRU MEDICAL COLLEGE,
NEHRU NAGAR, BELAGAVI-590010 (KARNATAKA-INDIA)
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Ref: MDC/DOME/93 **Date: 17/10/2016**

To,

PG student in Obstetrics and Gynaecology,
J.N.Medical College,
BELAGAVI.

Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled

"Association between Maternal and Fetal Risk Factors and Stillbirths in Tertiary Care Hospital in Belagavi- A One Year Observational Study"

is ethical and justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics Committee on Human Subjects Research.

(Dr. Arathi Darshan)
Member Secretary
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

(Dr. Ganga Pilli)
Chairman,
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

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ANNEXURE I – CONSENT FORM

INFORMED CONSENT

Title:. ASSOCIATION BETWEEN MATERNAL AND FETAL RISK FACTORS AND STILLBIRTH IN TERTIARY CARE HOSPITAL IN BELAGAVI- A ONE YEAR DESCRIPTIVE OBSERVATIONAL STUDY

It is estimated that 2.6 million stillbirths have occurred globally last year. Out of this global burden India has contributed 22%. The purpose of this study is to study the association between maternal, sociodemographic and fetal risk factors and stillbirths.

This study is under the guidance of , Professor, Department of OBG, J. N. Medical College, Belagavi. Your participation in this study voluntary. You will be giving information regarding your obstetric and sociodemographic details. We fully understand your grief but we request you to participate in the study by doing so you may contribute towards bridging the crucial knowledge gaps associated with stillbirths. Your participation in this study is not likely have any adverse effects. All information collected about you during the course of this study will be kept confidential.

Information from this study will be published but your identity may be confidential in any publication. No information about you or information provided by you during the research will be disclosed to other without your written permission.

In case you have any questions related to the study, in future or in case of study related injury or illness, you can contact :

- Dr. , Department of Obstetrics and Gynaecology, J.N Medical College, Ph. No.
- Dr. Department of Obstetrics and Gynaecology, J.N Medical College, Ph. No.
- If you have any queries about your rights as a study subject, you may call Dr.Ganga .S. Pilli, Professor, Department of Pathology, Chairman of J. N. Medical College Institutional Ethical Committee of Human Subjects Research, Phone No. 9448863866, at J. N. Medical College, Belgaum.

CONSENT STATEMENT

I voluntarily agree to take part in this study by signing below. I have been explained all the study details and that I shall be asked questions pertaining to the stillbirth which has occurred. My signature below indicates that I have read, or it has been read to me, this entire consent form, and have had all my questions answered.
In case of the queries during the study or in future you may contact following person.

Principle investigator: DR.
Post Graduate Student,
Department of Obstetrics and Gynecology,
J. N. Medical College,
K.L.E. University,
Belagavi 590010

Guide :DR.
Professor
Dept. of Obstetrics and Gynaecology,
J. N. Medical College,
Nehru Nagar, Belgaum- 590010

Name of the participant: (signature/thumbprint)

Name of the witness: (signature)

Name of the investigator: (signature)

Date:

Place:

Address :

Phone no:

ANNEXURE I – PROFORMA

DATA COLLECTION INSTRUMENT

Part A

Subject Information:

(i). Name: (ii). IP. Number | | | | | | |

(iii). Age: | | | years

(iv). Address :

Mother

Husband

(v). Contact Number | | | | | | | | | | |

(vi). Education

Mother: 1. No formal schooling ☐
(Illiterate)

2. No formal schooling ☐
(Literate)

3. Schooling- a. Years of schooling ☐

4. Don't know ☐

Husband 1. No formal schooling ☐
(Illiterate)

2. formal schooling ☐
(Literate)

3. Schooling- a. Years of schooling ☐

4. Don't know ☐

(vii). Occupation- 1.Housewife ☐

2. Labourer ☐

3. Agriculture ☐

4. Office work ☐

5. Other if, specify_____

(viii). Religion - 1.Hindu ☐ 2.Christian ☐ 3.Jain ☐

4. Muslim ☐ 5.Sikh ☐ 6.Other _____

(ix). Socio Economic Status

If Urban

Modified Kuppuswamy Scale

Score	-	Socio Economic status	
1.26-29		Upper	☐
2.16-25		Upper-Middle	☐
3.11-15		Lower-middle	☐
4.05-10		Lower Middle	☐
5.<05		Lower	☐

If Rural

Modified BG Prasad (May 2016)

1.≥ 6277	I	☐
2.3139-6276	II	☐
3.1883-3138	III	☐
4.942-1882	IV	☐
5. Less than 942	V	☐

BPL card holder 1. Yes ☐ 2. No ☐ 3. Don't know ☐

Part B

History and Examination: Complaints of 1 Decreased foetal movements ☐

2. Not appreciating foetal movements ☐

3. Pain abdomen ☐

4. Bleeding per vagina ☐

5. Other if, specify_____

(i). Present Pregnancy

I[st] Trimester: a) Pregnancy Diagnosed 1.Yes ☐
2. No
3. Dont know

b) If Yes by 1. Ultrasonography ☐
2. Urine Pregnancy Test
at ☐ month of amenorrhoea

c) Registered Ante natal Care centre ☐
1. Sub Centre
2. Primary Health Centre
3. Community Health Centre
4. Tertiary Health Centre

d)Dating Scan Done 1.Yes ☐
2. No
3. Don't know

e)Total no of Ante natal visits ☐

f) Any History of Bleeding per vagina 1.Yes ☐
2. No
3. Don't know

g) Any History of Hospital admission 1. Yes ☐
2. No
3. Don't know

If Yes Specify Cause _____

Days of admission ☐

Result _____

h) Folic Acid taken 1. Yes ☐

2. No

3. Don't know

i) Any other complaints (specify)

II Trimester

a)Care Taken at 1. Sub Centre ☐

2. Primary Health Centre

3. Community Health Centre

4. Tertiary Care Centre

b)Anomaly Scan done 1. Yes ☐

2. No

3. Don't know

c) Tetanus toxied injection 1. Yes ☐

2. No

3. Don't know

d)Total no. of Ante natal visits ☐

e) Iron and Calcium supplements taken ☐

1. Yes

2. No

3. Don't know

III Trimester

a)Care taken at 1. Sub Centre ☐

2. Primary Health Centre

3. Community Health Centre

4. Tertiary Care Centre

b) Iron and Calcium supplements taken ☐

1. Yes

2. No

3. Don't know

c)Growth Scan 1. Yes ☐

2. No

3. Don't know

d) Total no of visits ☐

(ii). Obstetric History

G	P	L	A
Score				

Married life ☐ years consanguinity1. Yes ☐

2. No

3. Don't know

	Previous Pregnancies								
	Duration of Pregnancy (in months)	Method of delivery(Vaginal-1, Assisted-2, Caesarean -3)	Outcome(Stillbirth-1, Live birth-2, MTP-3, Ectopic-4)	Place of delivery(Home-1, Hospital-2)	Weight of Newborn in kg(small-1, normali-2, don't know-3)	Sex of Newborn(male-1,female-2)	Alive (yes-1, no-2)	Age of child in years	Maternal complication(Anemia-1, APH-2, PIH-3, Others-4, Nil-5)
years									

(iii) Menstrual History:

LMP D D M M Y Y

EDD D D M M Y Y

C EDD- D D M M Y Y

if yes 1st Trimester scan ☐

2nd Trimester scan ☐

Period of Gestation Wks Days ☐☐☐

Previous Menstrual Cycles 1.Regular ☐

2. Irregular ☐

(iv) Past History : ☐

1. Known case of Hypertension
2. Known case of Diabetes mellitus
3. Known case of Cardiac illness
4. Known case of Tuberculosis

5. Known case of Asthma
6. Known case of Epilepsy
7. History of blood transfusion
8. Known case of Thyroid disorder
9. Any Known case of medical disorder

(v) Personal History:

Diet- 1. Vegetarian ☐
2. Mixed
3. Non-vegetarian

Habits- 1.Smoker ☐
2. Alcohol
3. Tobacco chewing

Drug history 1. Yes ☐
2. No
3. Don't know

If yes then,

Duration of Intake ☐ Years
☐ Months

Dose Frequency

Part C

Examination and investigation

Mother: a) General Physical Examination

Weight ☐ kg

Height ☐ cm

BMI before pregnancy ☐ kg/m^2

Systolic Blood pressure ☐ mmHg
At admission

Diastolic Blood pressure ☐ mmHg
At admission

Pulse Rate ☐ beats per minute

Temperature ☐ °F

Pallor 1. Yes ☐

2. No

Icterus 1. Yes ☐

2. No

Edema 1. Yes ☐

2. No

b) Respiratory System: Normal 1.Yes ☐

2. No

3. If no then specify findings.....

c) Cardiovascular System: Normal 1.Yes ☐

2. No

3. If no then specify findings.....

d) Per abdomen: Uterus size 1.20 weeks ☐

2.24 weeks

3. 32weeks

4. 36weeks

5. Term

Tender 1. Yes ☐

2. No

Presentation ☐

1.Vertex 2.breech 3.shoulder 4.face 5..other

Per vagina findings from records:

Baby (from Records): Weight ☐ kg Length ☐ cm

Sex 1. Male ☐

2. Female

Gestational age ☐ weeks

Stillbirth ☐

1. Fresh

2. Macerated

Congenital Anomaly 1.Yes ☐

2. No

Handed Over to Autopsy 1.Yes ☐

2. No

Investigation:

Haemoglobin At admission in labour room ☐ gm%

At last ante natal visit ☐ n%

Blood Group

		Rh	
A		+ve	
B		-ve	
AB			
O			

HIV 1.Positive ☐

2. Negative

HBS Ag 1.Positive ☐

2. Negative

TSH ☐ µIU/ml

DIPSI ☐ mg/dl

RBS ☐ mg/dl (or)

TORCH 1.Positive ☐

2. Negative

Special Investigation

Part D

Data to help determine cause of still birth (by interview & record)

(i). Ante partum

Q1) Registered within I trimester ☐

1. Yes
2. No
3. Don't know

Q2) Total no of Ante natal visits ☐

Q3) Last Ante natal Care Visit Date ☐☐☐ (D M Y)

Q4) Diagnosed as Pre Eclampsia ☐

1. Yes
2. No
3. Don't know

a)History of Convulsion ☐

1. Yes
2. No
3. Don't know

Q5) Diagnosed as Gestational Diabetes Mellitus ☐

1. Yes
2. No
3. Don't know

If yes

a) Period of Gestation at which diagnosed ☐ weeks
b) Treatment received
   1. Insulin ☐
   2. Medical Nutrition Therapy
   3. No Treatment

Q6) History of Ante partum haemorrhage ☐

1. Yes
2. No
3. Don't know

a)If yes A) Placenta previa ☐

B) Abruption

C) Unknown

Q7) Multi fetal gestation ☐

1. Yes
2. No
3. Don't know

Q8) Was she Anaemic at admission ☐

1. Yes
2. No
3. Don't know

a) If yes 1.Mild ☐

2. Moderate
3. Severe
4. Very severe

(According to ICMR)

Q9) when was last ultrasonography done ☐

1. within 1week
2. within 15 days
3. within 1month
4. within 1 month

Q10) Known maternal infection ☐

1. Malaria
2. Urinary Tract Infection
3. Varicella
4. Toxoplasmosis
5. Rubella

6. Herpes
7. HIV
8. HBsAG
9. Syphilis
10. Any other (specify)

Q11) Any growth abnormality 1. Yes ☐
2. No
3. Don't know
If Yes then ☐
1. Fetal Growth Restriction
2. Macrosomia

Q12) Any abnormality in liquor ☐
1. Yes
2. No
3. Don't know
If Yes then ☐
1. Oligohydramnios
2. Polyhydramnios

Q13) History of jaundice during antenatal period ☐
1. Yes
2. No
3. Don't know

(ii) Intrapartum:

Q14) Date and time when labor pain started

Date ☐ time ☐ AM/PM

Q15) Appreciating foetal movements 1.Yes ☐
2. No

If No then since when she is not appreciating ☐ hours

Q16) Whether membranes were intact ☐

1. Yes
2. No
3. Don't know

If No then ☐

1. Spontaneous rupture of membranes
2. Artificial rupture of membranes

Q17) was the liquor meconium stained

1 .Yes ☐
2. No
3. Don't know

Q18) What was the type of delivery ☐

1. Spontaneous
2. Induced

Q19) What was the method of delivery ☐

1. Vaginal
2. Instrumental delivery (indication-_____)
3. Emergency LSCS
4. Elective LSCS

Q20) Was the Episiotomy given1. Yes ☐
2. No

Q21) If it is not spontaneous than tick the indication for caesarean or assisted delivery ☐

1.Cord prolapse
2. Passage of meconium
3. Fetal distress
4. Maternal distress
5. Severe PIH

6.2nd stage arrest

7. Other specify_____

Q22) Did any of the following occur during delivery

☐

1. Fever
2. Severe pain
3. Heavy bleeding
4. Retained placenta

Q24) Total duration of the labor ☐

Q25) Delivery time ☐

Q26) Gestational age while delivery occurred ☐

Q27) Any gross congenital malformation ☐

1. Anencephaly
2. Encephalocele
3. Spina bifida
4. Meningocele
5. Hydrocephalus
6. Cleft lip
7. Cleft palate
8. Polydactyl
9. Any other specify

Q28) If birth injuries occurred ☐

1. Yes 2.No
3. If yes specify _____

Q29) When did the foetal death occurred ☐

1. Before the onset of labor
2. During labor

Q30) Placenta separation was ☐

1. Spontaneous 2. Manual removal of placenta

Q31) How was the placenta ☐

1. Complete and Healthy
2. Complete and calcified
3. Infarction
4. Other specify

Q33) Placenta and cord sent for Histopathological Examination ☐

1. Yes 2.No

If Yes

Histopathological Report:

_____

_____

_____

Q34) Foetus sent for autopsy ☐

1.Yes 2.No

If Yes then

Report_____

Q35) Assign probable cause of stillbirth

a) Maternal (tick appropriate)
Ante partum haemorrhage ☐
Infection ☐
Sepsis ☐
PROM ☐
Accident ☐
Obstructed labor ☐
PIH ☐
GDM ☐
Other specify_____

b) Foetal
Prematurity ☐
Congenital malformation ☐
Foetal trauma ☐
Other specify_____

c) Other _____

_____

_____

Signature of investigator_____

VERBAL AUTOPSY																																
											ANTEPARTUM												INTRAPARTUM										
IDENTIFICATION NUMBER	IP NO	AGE (YEARS)	REGISTERED/UNREGISTERED	SOCIO ECONOMIC STATUS	GRAVIDA	PARA	LIVING	GESTATIONAL AGE	SBP	DBP	PE	ECLAMPSIA	DM	ANAEMIA	PLACENTA PREVIA	ABRUPTION	MULTIPLE GESTATION	PRETERM LABOUR	IUGR	MATERNAL INFECTION	ABNORMALITY IN LIQUOR	JAUNDICE IN ANTENATAL PERIOD	MEMBRANES PRESENT /ABSENT	MECONIUM LIQUOR	METHOD OF DELIVERY	OBSTRUCTED LABOUR	STILLBIRTH	BIRTH WEIGHT	TIME OF FETAL DEATH	CONGENITAL ANOMALY	PLACENTA	FETAL TRAUMA	POSTPARTUM	CAUSE OF DEATH
A1	819353	24	R	K3	1	0	0	22	110	70	2	2	2	1A	2	2	2	1	2		2	2	2	2	1	2	1	500	2		1	2		CORD PROLAPSE
A2	819378	28	R	K3	3	2	2	38	160	110	1	2	2	1B	2	1	2	2	1		2	2	1	2	3	2	1	1800	2		1	2	3	ABRUPTION
A3	819730	20	R	R4	1	0	0	38	160	100	1	1	2	1A	2	1	2	2	2		2	2	1	2	3	2	1	2800	1		1	2		ECLAMPSIA
A4	818489	20	R	K3	1	0	0	43	130	90	2	2	2	2	2	2	2	2	2		3	2	2	2	1	2	2	2100	1		2	2		POSTTERM
A5	819132	21	R	R4	5	0	0	29	150	90	1	2	2	2	2	2	2	1	2		1A	2	2	1	1	2	1	1300	1		1	2		PREECLAMPSIA
A6	788963	26	R	R4	2	1	1	27	160	100	1	2	2	2	2	2	2	2	1		1A	2	1	2	1	2	1	600	1		2	2	SEVERE IUGR WITH ABSENT DIASTOLIC FLOW	
A7	805649	19	R	R4	1	0	0	35	110	80	2	2	2	2	2	2	2	2	2		2	2	2	2	1	2	1	1100	1	2	1	2		FETAL DISTRESS
A8	804516	30	R	K3	4	3	3	37	110	80	2	2	2	2	2	2	2	2	2		2	2	2	2	1	2	1	2300	1		1	2		PROM
A9	787512	24	R	R2	1	0	0	30	150	100	1	2	2	1C	2	1	2	1	1		3	2	1	3	1	2	2	1200	1		4	2	3	ABRUPTION
A10	793480	24	R	R3	2	1	1	26	110	80	2	2	2	2	2	2	2	2	2		2	2	1	2	1	2	2	390	1		1	2		NOT KNOWN
A11	786761	23	R	R4	2	1	1	31	160	100	1	1	2	1A	2	2	2	2	2		3	2	1	3	3	2	2	1450	1		2	2		ECLAMPSIA
A12	823534	32	R	K3	1	0	0	32	160	110	1	2	2	1B	2	1	2	2	1		3	2	1	2	1	2	1	1480	1		1	2		ABRUPTION
A13	816537	21	R	K3	1	0	0	38	110	80	2	2	2	2	2	2	2	2	2		2	2	2	2	1	2	2	1670	1		1	2		FETAL DISTRESS
A14	816086	24	R	K3	1	0	0	39	170	110	1	1	2	2	2	2	2	2	1		1A	2	1	2	3	2	1	2100	1		1	2		ECLAMPSIA
A15	825101	25	R	R3	2	1	1	37	110	80	2	2	2	1A	2	2	2	2	2		2	2	1	2	3	2	2	2620	1		1	2		NOT KNOWN
A16	787508	28	R	R4	3	2	1	40	150	100	1	2	2	1A	2	1	2	2	2		2	2	1	3	3	2	1	3600	1		1	2		PREECLAMPSIA
A17	823477	26	R	K4	3	2	2	21	110	80	2	2	2	2	2	2	2	2	2		2	2	2	2	1	2	1	400	1	9	1	2		CONGENITAL MALFORMATION
A18	823858	21	R	R4	1	0	0	36	110	80	2	2	2	2	2	2	2	1	2		2	2	1	2	1	2	1	1900	1	9	1	2		CONGENITAL MALFORMATION
A19	824425	23	R	R4	3	1	1	29	110	80	2	2	2	2	2	2	2	2	2		2	2	1	2	1	2	2	1220	1		2	2		TRAUMA OVER ABDOMEN
A20	816679	24	R	R2	1	0	0	30	150	100	1	2	2	1C	2	1	2	2	1		3	2	1	3	1	2	2	1200	1		1	2	3	ABRUPTION
A21	818413	24	R	K3	2	1	0	36	160	110	1	2	2	1A	2	2	2	2	1		2	2	1	2	1	2	1	1300	1		1	2		PREECLAMPSIA
A22	815076	28	R	R4	1	0	0	24	110	70	2	2	2	2	2	2	2	2	2		2	2	2	2	1	2	1	600	1		1	2		PPROM
A23	817907	25	R	R3	2	1	0	22	168	120	1	2	2	2	2	2	2	2	1		2	2	2	2	1	2	1	960	1		1	2		PREECLAMPSIA
A24	817928	30	R	K3	1	0	0	38	170	110	1	2	2	2	2	2	2	2	1		1A	2	1	2	3	2	1	1800	1		1	2		PREECLAMPSIA
A25	817115	20		K3	2	1	0	38	180	110	1	1	2	2	2	2	2	2	1		1A	2	1	2	3	2	1	2400	1		1	2		ECLAMPSIA
A26	833978	24	U	K3	1	0	0	37	160	110	1	2	2	2	2	1	2	2	2		2	2	1	2	1	2	1	2500	1		1	2		PREECLAMPSIA
A27	833004	24	U	R3	3	2	0	24	110	80	2	2	2	2	2	2	2	2	2		1A	2	1	2	1	2	1	750	1		1	2		UTI
A28	834272	23	R	R4	3	2	2	38	150	100	2	2	2	2	2	1	2	2	2		2	2	1	2	3	2	1	3300	1		1	2		PREECLAMPSIA
A29	834669	22	U	R4	2	1	1	34	140	90	1	2	2	2	2	2	2	2	2		2	2	1	2	1	2	1	2300						PREECLAMPSIA
A30	835011	26	U	K3	2	1	1	33	152	92	1	2	2	2	2	2	2	2	2		2	2	1	2	2	2	1	2000	1		1	2		PREECLAMPSIA
A31	835967	24	U	K3	7	3	2	36	100	80	1	2	2	2	2	2	2	2	2		2	2	2	2	1	2	1	3700	1		1	2		LIMB HYPOPLASIA
A32	836949	28	U	K3	2	1	2	30	110	80	2	2	2	2	2	2	2	2	2		2	2	2	2	1	2	1	580	1		1	2		UNKNOWN
A33	835700	30	R	R2	2	1	1	36	160	110	1	2	2	2	2	2	2	2	2		2	2	2	2	1	2	1	2400	1		1	2		PREECLAMPSIA
A34	837656	31	U	K3	2	1	1	33	160	110	1	2	2	2	2	2	2	2	1		1A	2	2	2	1	2	1	550	1		1	2		PREECLAMPSIA
A35	819378	28	R	R2	3	2	2	38	158	100	1	2	2	2	2	1	2	1	1		2	2	2	2	3	2	1	1800	1		1	2		ABRUPTION
A36	816509	21	U	K3	1	0	0	32	110	80	1	1	2	2	2	1	2	1	1		2	2	2	2	1	2	1	1400	1		1	2		PPROM
A37	817115	20	R	K4	2	1	1	38	110	80	1	1	2	2	2	2	2	1	1		2	2	1	1	3	2	1	2400	1		1	2		ECLAMPSIA
A38	817928	30	U	K2	1	0	0	38	170	100	1	2	2	2	2	2	2	2	2		2	2	1	2	3	2	1	1800	1		1	2		SEVERE PREECLAMPSIA
A39	817907	25	R	K2	2	1	1	22	168	120	1	2	2	2	2	2	2	1	2		2	2	1	2	1	2	1	960	1		1	2		SEVERE PREECLAMPSIA
A40	815076	28	U	R3	1	0	0	24	110	70	2	2	2	2	2	2	2	1	2		2	2	2	2	1	2	1	600	1		1	2		PPROM
A41	818321	28	U	K3	4	3	3	33	170	90	1	2	2	2	2	2	2	2	2		2	2	1	2	3	2	1	2000	1		1	2		ABRUPTION
A42	816334	35	R	R3	5	4	4	25	110	80	2	2	2	2	2	2	2	1	2		2	2	1	2	1	2	1	410	1		1	2		UTI
A43	791739	23	R	R4	3	1	1	25	110	80	2	2	2	1	2	2	2	1	2		1A	2	2	2	1	2	1	1000	1		1	2		PPROM
A44	791515	23	U	R4	1	0	0	22	160	100	1	1	2	1	2	2	2	1	2		2	2	2	2	1	2	1	410	1		1	2		ECLAMPSIA
A45	789714	38	R	R4	2	0	0	24	110	70	2	2	1	2	2	2	2	1	2		2	2	2	2	1	2	1	1070	1		1	2		DIABETES MELLITES
A46	789664	32	U	K2	3	2	2	37	140	90	1	2	2	2	1	2	2	2	1		1A	2	1	2	3	2	1	2400	1		1	2		SEVERE PREECLAMPSIA
A47	790125	28	U	K2	2	1	1	40	110	80	2	2	1	2	2	2	2	2	2		1A	2	1	2	1	2	1	3080	1		1	2		GESTATIONAL DIABETES MELLITUS

IDENTIFICATION NUMBER	IP NO	AGE (YEARS)	REGISTERED/UNREGISTERED	SOCIO ECONOMIC STATUS	GRAVIDA	PARA	LIVING	GESTATIONAL AGE	SBP	DBP	PE	ECLAMPSIA	DM	ANAEMIA	PLACENTA PREVIA	ABRUPTION	MULTIPLE GESTATION	PRETERM LABOUR	IUGR	MATERNAL INFECTION	ABNORMALITY IN LIQUOR	JAUNDICE IN ANTENATAL PERIOD	MEMBRANES PRESENT /ABSENT	MECONIUM LIQUOR	METHOD OF DELIVERY	OBSTRUCTED LABOUR	STILLBIRTH	BIRTH WEIGHT	TIME OF FETAL DEATH	CONGENITAL ANOMALY	PLACENTA	FETAL TRAUMA	POSTPARTUM	CAUSE OF DEATH	
A48	805838	25	U	K2	1	0	0	27	110	70	2	2	2	1	2	2	2	1	2		2	2	1	2	3	2	2	1200	1		1	2		NON IMMUNE HYDROPS	
A49	782135	24	R	R4	5	2	0	28	100	80	2	2	1	2	2	2	2	1	2		2	2	1	2	2	2	1	900	1		1	2		OVERT DIABETES MELLITS	
A50	787121	24	R	R4	3	2	1	32	140	90	1	2	2	1	2	2	2	1	2		2	2	2	2	1	2	1	1360	1		1	2		PPROM	
A51	791897	18	U	K5	1	0	0	22	110	80	2	2	2	2	2	2	2	1	2		2	2	2	2	1	2	1	580	1		1	2		PPROM	
A52	816930	24	R	K3	1	0	0	23	110	70	2	2	2	2	2	2	2	1	2		2	2	1	2	1	2	1	600	1		1	2		PPROM	
A53	823477	26	U	K4	3	2	2	21	110	80	2	2	2	2	2	2	2	1	2		2	2	2	2	1	2	1	400	1	1	1	2		OMPHALOCELE	
A54	805428	34	R	R3	4	2	2	24	110	70	2	2	2	1	2	1	2	1	2		2	2	1	2	1	2	1	520	1		1	2		ABRUPTIO PLACENTA	
A55	793501	28	R	R3	1	0	0	40	110	80	2	2	2	1	2	2	2	2	2		2	2	1	1	1	2	1	3200	1		1	2		MUCONEUM ASPIRATION	
A56	804632	37	R	K3	3	2	1	21	110	80	2	2	1	2	2	2	2	2	2		2	2	2	2	1	2	1	680	1	1	1	2		TRANSPOSITION OF GREAT ARTERIS	
A57	804546	24	R	R3	2	1	1	21	98	70	2	2	2	1	2	2	2	1	2		2	2	2	2	1	2	1	480	1	1	1	2		PPROM WITH HYDRONEPHROSIS	
A58	787512	24	U	R3	1	0	0	29	150	100	1	2	2	1	2	1	2	2	2		2	2	1	2	1	2	1	1200	1		1	2		ABRUPTIO PLACENTA	
A59	804516	30	U	K3	4	3	3	37	110	80	2	2	2	1	2	2	2	2	2		2	2	2	2	1	2	1	2300	1		1	2		PROM	
A60	819132	21	U	R4	5	0	0	28	150	90	1	2	2	1	2	2	2	2	2		2	2	1	2	1	2	1	1300	1		1	2		PREECLAMPSIA	
A61	787012	28	R	R3	3	2	2	27	110	80	2	2	1	2	2	2	2	1	2		2	2	2	2	1	2	1	1100	1		1	2		GESTATIONAL DIABETES MELLITUS	
A62	788084	20	U	R4	1	0	0	38	110	80	2	2	1	2	2	2	2	2	2		2	2	2	2	1	2	1	2700	1		1	1		UNKNOWN	
A63	787613	28	R	K4	3	2	2	39	148	100	1	2	2	1	2	2	2	2	2		2	2	1	2	1	2	2	3180	1		1	2		UNKNOWN	
A64	786761	23	U	R5	2	1	1	31	120	90	1	1	2	2	2	2	2	1	2		2	2	1	2	3	2	1	1450	1		1	2		ECLAMPSIA	
A65	787513	24	R	R2	1	0	0	32	138	100	1	2	2	1	2	1	2	1	2		2	2	1	2	3	3	1	1800	1		1	2		ABRUPTIO PLACENTA	
A66	792584	28	U	R4	2	1	1	39	110	80	2	2	2	1	2	2	2	2	2		2	2	1	2	3	2	1	3230	1		1	2		UTERINE RUPTURE	
A67	809064	20	U	R4	1	0	0	29	140	90	1	2	2	2	2	1	2	2	2		2	2	1	2	1	2	1	1000	1		1	2		ABRUPTION	
A68	838856	24	U	R4	2	1	1	38	140	100	1	2	2	2	2	2	2	2	2		2	2	1	2	1	2	1	2690	1		1	2		IMMINENT ECLAMPSIA	
A69	835569	26	U	R3	3	2	2	28	126	80	2	2	2	2	2	2	2	1	2		2	2	2	2	1	2	1	320	1		1	2		EXTREME PREMATURITY	
A70	838589	24	U	R4	1	0	0	26	146	90	1	2	2	2	2	2	2	1	2		2	2	2	2	1	2	1	730	1		1	2		EXTREME PREMATURITY	
A71	839423	23	R	R3	5	3	2	27	110	70	2	2	2	2	2	2	2	2	2		2	2	1	2	1	2	1	1080	2	9	1	2		DANDY WALKER MALFORMATION	
A72	839548	24	U	R3	2	1	1	30	140	90	1	2	2	2	2	1	2	2	2		2	2	1	2	1	2	1	2080	1		1	2		ABRUPTION	
A73	839519	20	U	R2	1	0	0	33	110	80	2	2	2	1	2	2	2	2	1		2	2	1	2	1	2	2	820	1		1	2		SEVERE IUGR	
A74	839800	24	U	R4	5	4	2	21	120	80	2	2	2	2	2	2	2	1	2		2	2	2	2	1	2	1	400	1	9	1	2		SKELETAL DYSPLASIA	
A75	840459	30	U	R3	3	2	2	29	150	100	1	2	2	1	2	1	2	2	2		2	2	1	2	3	2	1	1200	1		1	2		ABRUPTION	
A76	840717	24	R	R4	1	0	0	32	158	100	1	2	2	1	2	2	2	2	1		2	2	1	2	3	2	1	1240	2		1	2		SEVERE IUGR	
A77	840628	30	R	R3	3	1	1	27	150	100	1	2	2	1	2	2	2	1	2		2	2	1	2	1	2	1	900	2		1	2		EXTREME PREMATURITY	
A78	841176	35	U	R2	3	2	2	34	130	90	2	2	2	1	2	2	2	2	2		2	2	1	2	3	2	1	2300	1		1	2		ABRUPTION	
A79	841280	23	R	K3	1	0	0	30	146	90	1	2	2	1	2	2	2	2	2		2	2	1	2	1	2	1	1680	2	9	1	2		TOF	
A80	842644	24	U	K3	1	0	0	37	140	100	1	2	1	1	2	2	2	2	2		2	2	1	2	3	2	1	3400	1		1	2		PE WITH OVERT DM	
A81	842889	28	R	K4	2	1	1	24	146	90	1	2	2	1	2	2	2	2	2		2	2	1	2	1	2	1	370	2		1	2		CHRONIC HYPERTENSION WITH RENAL DISEASE	
A82	843148	24	U	R3	1	0	0	27	120	80	2	2	2	1	2	2	2	2	2		2	2	1	2	1	2	1	260	1		1	2		UNKNOWN	
A83	843388	23	U	R3	1	0	0	41	140	90	1	2	2	2	2	2	2	2	2		2	2	1	2	1	2	2	2900	1		1	2		POSTDATED WITH SEVERE PE	
A84	843788	23	U	K3	1	0	0	21	126	80	2	2	2	2	2	1	2	1	2		2	2	2	2	5	2	1	470	2		1	2		APH	
A85	844715	25	U	R3	1	0	0	31	140	90	1	2	2	1	2	1	2	2	2		2	2	2	2	1	2	1	1700	1		1	2		ABRUPTION	
A86	844527	24	R	K4	1	0	0	41	120	80	2	2	2	2	2	2	2	2	2		1A	2	1	2	1	2	1	3400	1		1	2		ANAMINOS WITH IUD	
A87	844680	22	U	K3	1	0	0	22	120	86	2	2	2	1	2	2	2	2	2		2	2	2	2	1	2	1	500	2	9	1	2		HEART DISEASE	
A88	844517	24	R	K4	1	0	0	37	130	90	1	2	1	1	2	2	2	2	2		2	2	1	2	1	2	2	3500	1		1	2		UNCONTROLLED DM WITH IUD	
A89	845062	30	R	R4	3	2	2	40	120	80	2	2	2	2	2	2	2	2	2		2	2	1	2	3	1	1	2900	2	9	1	2		OBSTRUCTED LABOUR WITH SKELETAL DYSPLASIA	
A90	845470	23	U	K3	1	0	0	27	140	90	1	2	2	2	2	2	2	2	2		2	2	1	2	1	2	1	800	2		1	2		IMMINENT ECLAMPSIA	
A91	846108	28	U	K3	2	1	0	40	150	90	1	2	2	2	2	2	2	2	2		2	2	1	2	1	2	2	2100	1		1	2		SEVERE PE WITH IUGR	
A92	846854	23	U	K3	1	0	0	23	120	80	2	2	2	2	2	2	2	2	2		2	2	1	2	1	2	1	300	2	1	1	2		ANENCEPHALY	
A93	847699	32	U	K4	4	3	2	32	130	90	1	2	1	2	2	1	2	2	2		2	2	1	2	3	2	1	1400	2		1	2		ABRUPTION	
A94	848116	24	U	K3	2	1	1	39	120	80	2	2	2	2	2	2	2	2	2		2	2	1	2	1	2	1	2600	1		1	2		IUD	
A95	848076	30	R	K4	2	1	1	36	140	90	1	2	2	2	2	1	2	2	2		2	2	1	2	3	2	2	2800	2	1	1	2		ABRUPTION	
A96	848153	32	U	R3	2	1	0	27	140	100	1	2	2	1	2	2	2	2	1		1A	2	1	2	1	2	1	1580	2		1	2		SEVERE IUGR	

IDENTIFICATION NUMBER	IP NO	AGE (YEARS)	REGISTERED/UNREGISTERED	SOCIO ECONOMIC STATUS	GRAVIDA	PARA	LIVING	GESTATIONAL AGE	SBP	DBP	PE	ECLAMPSIA	DM	ANAEMIA	PLACENTA PREVIA	ABRUPTION	MULTIPLE GESTATION	PRETERM LABOUR	IUGR	MATERNAL INFECTION	ABNORMALITY IN LIQUOR	JAUNDICE IN ANTENATAL PERIOD	MEMBRANES PRESENT /ABSENT	MECONIUM LIQUOR	METHOD OF DELIVERY	OBSTRUCTED LABOUR	STILLBIRTH	BIRTH WEIGHT	TIME OF FETAL DEATH	CONGENITAL ANOMALY	PLACENTA	FETAL TRAUMA	POSTPARTUM	CAUSE OF DEATH	
A97	848335	24	U	K3	1	0	0	38	120	80	2	2	2	1	2	2	2	2	1		2	2	1	2	1	2	2	2170	1		1	2		IUGR	
A98	848427	35	U	R3	5	2	1	35	120	86	2	2	2	2	2	1	2	2	2		2	2	1	2	1	2	1	2090	1		1	2		ABRUPTION	
A99	848723	23	U	K4	1	0	0	33	140	90	1	2	2	1	2	2	1	2	2		2	2	1	2	3	2	1	IN A-1	1		1	2		SEVERE PE	
A100	849172	30	U	K3	3	1	1	37	124	80	2	2	2	2	2	2	2	2	2		2	2	1	2	3	2	1	2000	1		1	2		ABRUPTION	
A101	849176	28	U	R2	2	1	1	25	150	##	1	2	2	1	2	1	2	2	1		2	2	2	2	1	2	1	##	1		1	2		SEVERE PRECLAMPSIA	
A102	849523	24	U	K1	1	0	0	35	100	80	2	2	2	1	2	2	2	2	2		2	2	1	2	1	2	1	2300	1	9	1	2		EBSTIEN ANOMALY	
A103	849530	30	U	K2	3	2	0	33	140	100	1	2	2	1	2	1	2	2	2		2	2	1	2	3	2	1	1400	1		1	2		ABRUPTION	
A104	849253	25	R	R2	1	0	0	26	100	80	2	2	2	1	2	2	2	1	1		2	2	1	2	1	2	2	1100	1		1	2		SEVERE IUGR	
A105	826803	28	U	K3	4	2	2	36	140	90	1	2	2	1	2	1	2	2	2		2	2	1	2	1	2	2	2900	1		2	2		SEVERE PE WITH ABRUPTION	
A106	826720	22	R	R5	1	0	0	35	100	70	2	2	2	1	2	2	2	2	1		2	2	1	2	1	2	2	1890	1		2	2		SEVERE IUGR	
A107	826329	24	U	K3	3	2	1	20	100	70	2	2	2	2	2	2	2	2	2		1A	2	2	2	1	2	1	650	1		1	2		SEVERE OLIGOHYDROMNIOS	
A108	826701	27	U	K2	1	0	0	20	100	70	2	2	2	2	2	2	2	2	2		2	2	2	2	1	2	1	510	1	1	1	2		ANENCEPHALY	
A109	828069	22	R	K3	1	0	0	34	100	80	2	2	2	1	2	2	2	2	2		2	2	1	2	1	2	1	2300	1		1	1		UNKNOWN	
A110	828108	26	U	R2	1	0	0	24	150	80	1	2	2	1	2	2	2	2	2		2	2	1	2	1	2	1	440	1		1	2		PRE ECLAMPSIA	
A111	828651	24	U	K4	2	1	1	28	100	80	2	2	2	2	2	2	2	ook0 z	2		2	2	1	2	1	2	2	1230	1		1	2		UNKNOWN	
A112	828721	22	R	R3	1	0	0	22	100	78	2	2	2	2	2	2	2	2	2		1B	2	1	2	1	2	1	790	1		1	2		NON IMMUNE HYDROPS	
A113	828565	23	R	K4	1	0	0	23	120	80	2	2	2	1	2	2	2	2	2		1A	2	2	2	1	2	1	580	1		1	2		PPROM	
A114	829293	21	R	K2	1	0	0	26	100	80	2	2	2	2	2	2	2	2	1		2	2	1	2	1	2	2	620	1		1	2		SEVERE IUGR	
A115	829972	26	U	R5	1	0	0	25	100	60	2	2	2	1	2	2	2	2	1		2	2	1	2	1	2	1	570	1		1	2		SEVERE IUGR	
A116	830303	25	U	K3	3	1	1	21	110	70	2	2	2	1	2	2	2	2	2		2	2	1	2	1	2	1	410	1	5	1	2		HYDROCEPHALUS	
A117	830816	26	U	R2	1	0	0	26	100	60	2	2	2	1	2	2	2	2	2		2	2	1	2	1	2	1	780	1	9	1	2		TRANSPOSITION OF GREAT ARTERIS	
A118	830757	32	U	K3	6	5	5	30	100	70	2	2	2	1	2	2	2	2	2		1B	2	1	2	1	2	1	2270	1		2	2		NON IMMUNE HYDROPS	
A118	831323	19	R	K2	1	0	0	35	164	110	1	1	2	1	2	1	2	2	2		2	2	1	2	1	2	1	2180	1		1	2		ECLAMPSIA	
A119	831861	28	U	R3	2	1	2	34	150	100	1	2	2	1	2	1	2	2	2		2	2	1	2	3	2	2	1450	1		1	2		ABRUPTION	
A120	831571	25	U	K3	2	0	0	25	140	80	1	2	2	1	2	1	2	2	2		2	2	1	2	1	2	1	870	1		1	2		ABRUPTION	
A121	820456	30	U	K2	3	2	2	34	160	110	1	2	2	1	2	1	2	2	2		2	2	1	2	1	2	2	1500	1		1	2		SEVERE PRECLAMPSIA	
A122	820760	26	U	R2	1	0	0	31	100	80	2	2	2	2	2	2	2	2	2		1B	2	1	2	1	2	1	1060	1		1	2		UNKNOWN	
A123	820883	26	U	R3	3	1	1	25	100	80	2	2	2	2	2	2	2	2	2		2	2	1	2	1	2	2	440	1		1	2		UNKNOWN	
A124	820939	24	R	K5	1	0	0	40	112	84	2	2	1	1	2	2	2	2	2		2	2	1	2	1	2	2	3100	1		1	2		GESTATIONAL DIABETES MELLITUS	
A125	820933	25	R	R3	2	0	2	28	110	80	2	2	2	2	2	2	2	2	2		2	2	1	2	1	2	2	1100	1		2	2		UNKNOWN	
A126	821196	25	U	K2	1	0	0	31	122	78	2	2	2	1	2	2	2	2	2		2	2	1	2	1	2	2	1670	1		2	2		GESTATIONAL DIABETES MELLITUS	
A127	821762	19	U	K3	1	0	0	34	140	90	1	2	2	1	2	2	2	2	2		2	2	1	2	1	2	2	1200	1		2	2		UNKNOWN	
A128	822351	29	R	K3	3	2	1	22	100	80	2	2	2	2	2	2	2	1	2		2	2	2	2	1	2	1	300	1	9	1	2		HOLOPROENCEPHALY	
A129	819963	30	R	R2	2	1	0	36	120	80	2	2	2	1	2	2	2	2	2		2	2	1	2	1	2	1	2820	1		1	2		CORD TRUE KNOT	
A130	823858	21	U	K3	1	0	0	36	100	70	2	2	2	1	2	2	2	2	2		1B	2	1	2	1	2	1	1900	1	9	1	2		DANDY WALKER MALFORMATION	
A131	823534	32	R	R2	1	0	0	31	150	80	1	2	2	1	2	1	2	2	2		2	2	1	2	1	2	1	1400	1		1	2		ABRUPTION	
A132	824425	23	U	K3	3	1	1	29	130	80	2	2	2	1	2	2	2	2	2		2	2	1	2	1	2	1	1200	1		1	2		UNKNOWN	
A133	825101	25	R	R4	2	1	1	36	100	70	2	2	2	1	2	2	2	2	2	4	2	2	1	2	1	2	2	2620	1		1	2		TOXOPLASMOSIS	
A134	824713	26	R	K3	1	0	0	30	100	66	2	2	2	2	2	2	2	2	2		1B	2	1	2	1	2	2	1600	1	9	1	2		NON IMMUNE HYDROPS	
A135	823612	25	R	K5	2	1	1	25	110	80	2	2	2	2	2	2	2	2	2		1A	2	2	2	1	2	1	940	1	9	1	2		FETAL DYSMORPHOSIS	
A136	815076	25	R	R3	1	0	0	24	120	80	2	2	2	2	2	2	2	2	2		1A	2	2	2	1	2	1	690	1	3	1	2		SPINA BIFIDA	
A137	816086	26	R	R3	1	0	0	39	160	110	1	1	2	1	2	1	2	2	2		2	2	1	2	3	2	1	2100	1		1	2		ECLAMPSIA	
A138	816679	24	U	K3	1	0	0	41	120	80	1	2	2	1	2	2	2	2	2		2	2	1	2	1	2	1	2490	1		1	2	1	POSTTERM	
A139	816334	26	U	R2	5	4	4	25	100	80	2	2	2	2	2	2	2	2	2		2	2	1	2	1	2	1	410	1		1	2		UNKNOWN	
A140	817928	28	U	K5	4	3	1	27	160	80	1	2	2	1	2	1	2	2	2		2	2	1	2	1	2	1	780	1		1	2		ABRUPTION	
A141	818321	30	U	K3	4	3	3	33	150	100	1	2	2	1	2	1	2	2	2		2	2	1	2	3	2	1	2000	1		1	2		SEVERE PRE ECLAMPSIA WITH ABUPTION	
A142	819132	32	R	R2	6	0	0	28	100	80	2	2	2	2	2	2	2	2	2		1A	2	1	2	1	2	1	1300	1	9	1	2		SEVERE OLIGOHYDROMNIOS	
A143	819379	28	U	R3	3	2	2	38	140	100	1	2	2	1	2	1	2	2	2		2	2	1	2	3	2	1	1800	1		1	2		UTERINE RUPTURE	
A144	819353	26	U	R3	1	0	0	22	110	80	2	2	2	1	2	2	2	1	2		1A	2	2	2	1	2	1	500	1		1	2		CORD PROLAPSE	

IDENTIFICATION NUMBER	IP NO	AGE (YEARS)	REGISTERED/UNREGISTERED	SOCIO ECONOMIC STATUS	GRAVIDA	PARA	LIVING	GESTATIONAL AGE	SBP	DBP	PE	ECLAMPSIA	DM	ANAEMIA	PLACENTA PREVIA	ABRUPTION	MULTIPLE GESTATION	PRETERM LABOUR	IUGR	MATERNAL INFECTION	ABNORMALITY IN LIQUOR	JAUNDICE IN ANTENATAL PERIOD	MEMBRANES PRESENT /ABSENT	MECONIUM LIQUOR	METHOD OF DELIVERY	OBSTRUCTED LABOUR	STILLBIRTH	BIRTH WEIGHT	TIME OF FETAL DEATH	CONGENITAL ANOMALY	PLACENTA	FETAL TRAUMA	POSTPARTUM	CAUSE OF DEATH	
A145	819083	24	U	R5	1	0	0	20	100	80	2	2	2	2	2	2	2	2	2		1A	2	1	2	1	2	1	350	1	9	1	2		ABSENT CEREBELLAR HEMISPHERE	
A146	819664	26	R	K2	2	0	0	25	100	80	2	2	2	2	2	2	2	2	1		2	2	1	2	1	2	1	540	1		1	2		SEVERE IUGR	
A147	818489	24	U	K3	1	0	0	43	100	80	2	2	2	2	2	2	2	2	2		2	2	1	2	1	2	2	2100	1		1	2		POSTDATISM	
A148	815513	22	U	R3	1	0	0	39	140	80	1	2	2	2	2	2	2	2	2		2	2	1	2	1	2	1	2100	2		1	2		BIRTH ASPHYXIA	
A149	802627	21	U	R3	2	1	1	23	100	80	2	2	2	2	2	2	2	1	2		2	2	2	2	1	2	1	540	1		1	2		PPROM	
A150	802560	23	U	K2	1	0	0	24	150	90	1	2	2	2	2	2	2	2	2		2	2	1	2	1	2	1	680	1		1	2		IMMINENT ECLAMPSIA	
A151	802643	26	R	K3	3	2	1	21	100	70	2	2	2	2	2	2	2	2	1		2	2	1	2	1	2	1	460	1		1	2		NON IMMUNE HYDROPS	
A152	803366	25	U	K2	1	0	0	25	160	100	1	2	2	2	2	2	2	2	1		2	2	1	2	1	2	1	900	1		1	2		SEVERE PRE ECLAMPSIA	
A153	805649	23	U	R2	1	0	0	35	100	80	2	2	2	2	2	2	2	2	2		2	2	1	2	1	2	1	1100	1		1	2		ANENCEPHALY	
A154	805407	26	U	K3	3	2	2	32	160	100	1	2	2	1	2	2	2	2	1		2	2	1	2	1	2	1	1130	1		2	2		SEVERE PRE ECLAMPSIA WITH IUGR	
A155	807007	27	U	R3	1	0	0	26	170	100	1	2	2	1	2	1	2	2	2		2	2	1	2	1	2	1	520	1		1	2		SEVERE PRE ECLAMPSIA	
A156	791513	23	U	R2	1	0	0	22	140	100	1	1	2	1	2	2	2	2	2		2	2	1	2	1	2	1	1900	1		1	2		ABRUPTION	
A157	791739	22	U	R2	2	1	1	25	100	80	2	2	2	2	2	2	2	2	2		1A	2	2	2	1	2	1	1000	1	AND	1	2		ENCEPHALOCELE AND SPINA BIFIDA	
A158	791851	26	R	K3	2	1	1	32	140	100	1	2	2	2	2	1	2	2	2		2	2	1	2	3	2	1	1900	1		1	2		ABRUPTION	
A159	791885	25	U	R3	3	2	1	23	100	80	2	2	2	2	2	2	2	2	2		2	2	1	2	1	2	1	940	1	9	1	2		CARDIAC ANOMALY	
A160	793501	28	U	K4	1	0	0	40	120	80	2	2	2	2	2	2	2	2	2		2	2	1	1	1	2	1	3200	1		1	2		MUCONEUM ASPIRATION	
A161	793601	20	U	K3	1	0	0	33	140	80	1	2	2	2	1	1	2	1	1		2	2	1	2	1	2	1	870	1		1	2		ABRUPTION	
A162	793526	22	R	R3	2	1	1	21	100	80	2	2	2	2	2	2	2	1	1		1A	2	2	2	1	2	2	320	1		1	2		PPROM	
A163	794285	19	U	R2	1	0	0	24	100	80	2	2	2	2	2	2	2	2	2		1A	2	2	2	1	2	1	720	1		1	2		PPROM	
A164	794510	20	R	R3	1	0	0	26	100	70	2	2	2	2	2	2	1	1	2		2	2	1	2	1	2	1	580	1		1	2		PPROM	
A165	794228	19	R	K3	2	0	0	33	140	90	1	2	2	1	2	2	2	2	2		2	2	2	2	1	2	1	1350	1		1	2		PREECLAMPSIA	
A166	793571	23	R	R2	1	0	0	30	140	90	1	2	1	1	2	2	2	2	2		2	2	1	2	1	2	1	1900	1		1	2		GESTATIONAL DIABETES MELLITUS	
A167	794542	23	R	R3	1	0	0	35	140	90	1	2	2	1	2	1	2	2	2		2	2	1	2	1	2	1	1200	1		1	2		ABRUPTION	
A168	767986	23	U	R2	2	1	1	23	100	80	2	2	2	2	1	2	2	2	2		2	2	1	2	1	2	1	420	1		1	2		PLACENTA PREVIA	
A169	797018	20	U	K3	3	2	2	39	114	86	2	2	1	1	2	2	2	2	2		2	2	1	2	1	2	2	3700	1		1	2		GESTATIONAL DIABETES MELLITUS	
A170	793533	25	U	K3	2	1	1	26	110	80	2	2	2	2	2	2	2	2	2		1A	1	2	2	1	2	1	1200	1	9	1	2		DIAPHREGMATIC HERNIA	
A171	793623	20	U	R2	2	1	0	24	160	90	1	1	2	1	2	2	2	2	2		2	2	2	2	1	2	1	600	1		1	2		ECLAMPSIA	