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Study of incidence and determinants of stillbirth among women in tertiary care centre

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Abstract
Background: The loss of a baby due to stillbirth remains a sad reality for many families and takes a serious toll on families' health and well-being. Every year, an estimated 2.6 million stillbirths occur worldwide, with up to 98% occurring in low- and middle-income countries. This study aimed to examine factors associated with stillbirths and to set the priorities and actions to reduce stillbirths.
Materials and Methods: It is a hospital based Descriptive Study with Retrospective study design under Dept.of OBG in GMC, Bambolim during period of 1st October 2019 to 1st January 2020.
Collection of data was carried using predesigned and pretested proforma.
Results: In the study period Total of 213 stillbirths were recorded, among them 106 in 2018 and 107 in 2017. Majority of the stillbirths are associated with severe preeclampsia (58 mothers). After thorough analysing probable cause of every stillbirths we concluded that 28.6%(61)being unknown, known causes were 5.6%(12) MASF, 17.3%(37)abruption, 20.6%(44)prematurity and severe iugr, 5.2%%(11) anomalies, 10.7%(23)hypertensive disorders of pregnancy and others 12%(25).
Conclusion: The incidence rate of stillbirths in our setting is high as being the only tertiary referal centre in Goa and the identified determinants were related to both ante-partum and intrapartum-period. Therefore, effort should be made to improve antenatal, obstetric services and delivery services in terms awareness, access, timing.

Keywords: stillbirth, incidence, determinants, risk factors, preeclempsia

Introduction
The definition recommended by WHO for international comparison is a baby born with no signs of life at or after 28 weeks' gestation.
Stillbirth is further classified as either early, late, or term.

- An early stillbirth is a fetal death occurring between 20 and 27 completed weeks of pregnancy.
- A late stillbirth occurs between 28 and 36 completed pregnancy weeks.
- A term stillbirth occurs between 37 or more completed pregnancy weeks.

Because of advances in medical technology over the last 30 years, prenatal care (medical care during pregnancy) has improved, which has dramatically reduced the number of late and term stillbirth [1]. However, the rate of early stillbirth has remained about the same over time [1].

Risk factors
Stillbirth with an unknown cause is called "unexplained stillbirth." Stillbirth occurs in families of all races, ethnicities, and income levels, and to women of all ages. However, stillbirth occurs more commonly among certain groups of people including women who:

- are of black race
- are 35 years of age or older
- are of low socioeconomic status
- smoke cigarettes during pregnancy
- have certain medical conditions, such as high blood pressure, diabetes and obesity
- have multiple pregnancies such as triplets or quadruplets
- have had a previous pregnancy loss

Advanced maternal age and increased maternal body mass index (BMI) are identified as risk factors of stillbirths Smoking during pregnancy or exposure to environmental smoke causes an

increased risk of stillbirth [2] Smoking is a modifiable lifestyle choice, and its effect should be preventable.

Nearly half of stillbirths are small for their gestational age [3] In the case of existing intrauterine growth restrictions, adequate diagnosis and management offer a significant opportunity to improve outcomes and reduce potentially preventable stillbirths [4].

Despite extensive evaluations, stillbirths from uncertain reasons account for 25–60% of total events, a rate of 2.8/1000 births [5]. In term pregnancy, the incidence of unexplained fetal demise could be as high as 0.9/1000 births [6]. This number may be overestimated because of insufficient diagnostic experience and equipment

There is about 10% of all stillbirths being related to maternal medical illnesses [7]. Among these diseases, hypertension and diabetes mellitus are the most common. Hypertension is one of the most common medical conditions that complicate pregnancy with an incidence of 7–10% [8]. The disease would complicate proteinuria, often called preeclampsia. About 5.6–9.4% of pregnancies complicated by preeclampsia end in intrauterine fetal demise. Hypertensive pregnancies are responsible for 4–9% of all fetal deaths. The stillbirth rate is 5–52/1000 births, depending on the severity of complications from hypertension [7].

There is a 2- to 5-fold risk of stillbirth for overt diabetes mellitus.Diabetic pregnancy is responsible for about 3% of all stillbirths. The stillbirth rate for pregnancies complicated by diabetes mellitus is 5–35/1000 [7]. The risk of diabetic pregnancy and stillbirths may be underestimated. Under adequate treatment of gestational diabetes, the pregnancy outcome is similar to that of the general population [9].

Hypothyroidism is a known risk factor for pregnancy-induced hypertension, intrauterine growth restriction, and intrauterine demise [10]. The prevalence of overt and subclinical hypothyroidism is 0.1–2% and 2.3–8%, respectively.

About 10–20% of stillbirths are attributed to intrinsic fetal anomalies, giving a stillbirth rate of 0.5–0.9 per 1000 births [11]. One research determined that the risk of major congenital anomaly among stillbirths was 20-fold higher compared to that among live births, and most anomalies were anencephaly. Chromosomal abnormalities of the fetus account for 6–13% of all stillbirths.

Placental abruption is defined as the separation of the placenta from the uterine wall prior to labor. Cessation of blood flow and subsequent acute asphyxia of the fetus are the most immediate effects. The severity is positively associated with the causes and the area of abruption. Placental abruption complicates 1–3.75% of pregnancies [12, 13] and accounts for 9–15.2% of total stillbirths. The stillbirth rate from placental abruption is about 0.5/1000 birth [12]. Traumatic factors are accident related, whereas nontraumatic factors are usually related to prior cesarean section, hypertensive disorders, parity, maternal age, smoking, and gestational age.

Stillbirth is an important global health problem affecting over 7000 families every day and is associated with emotional, social and economic consequences [14]. In 2015 there were 2.6 million stillbirths globally, with more than 7178 deaths a day. The average stillbirth rate in the United States is approximately 1 in 160 births, which is roughly 26,000 stillbirths each year [15]. The vast majority of stillbirths worldwide (98%) happen in low and middle-income countries, where medical care can be of low quality or unavailable.Ninety-eight percent occurred in low- and middle-income countries. About half of all stillbirths occur in the intrapartum period, representing the greatest time of risk. Reliable estimates calculate that yearly about 2.6 million stillbirths occur worldwide during the third trimester.

The majority of stillbirths are preventable, evidenced by the regional variation across the world. The rates correlate with access to maternal healthcare. The Government of India has developed an Indian Newborn Action Plan which includes efforts to 'reduce stillbirths to <10 per 1000 births by 2030'.(16) A modest reduction in India's SBR would translate into thousands of lives saved. The every newborn action plan (ENAP) to end preventable deaths has a set stillbirth target of 12 per 1000 births or less by 2030. Global ARR needs to more than double the present ARR of 2% to accomplish this target for reduction in stillbirth [16].

Strategies for preventing stillbirth

Regular antenatal care is advised in order to assure healthy mother and fetus and also for early diagnosis of risk factors. Life style changes like avoiding smoking, alcohol, proper nutrition, avoid stress etc are indicated. Strict daily fetal movement count and left lateral position while sleeping can be of help near and at term pregnancy. More frequent antenatal visits are advised to high risk mothers and proper treatment for the co morbid conditions decrease the risk of stillbirth.

Scenario in India

India has highest number of stillbirths in the world. In India, the stillbirth rates (SBR) varied from 20 to 66 per 1,000 total births in different States. The current Perinatal mortality rate in India is 35.1 per 1000.

Some novel approaches by Govt of India will definitely lead to decrease perinatal mortality:

- National Rural Health Mission (NRHM) - To pro- vide healthcare and advanceinstitutional deliveries to people living in the rural areas.
- The Health Management Information System (HMIS) – a web based portal launched in2008 will be a 'single-window' for all public health data, for Ministry of Health andFamily Well-fare.
- Mother and Child Tracking System (MCTS) jointly developed by the Ministry of Healthand Family Welfare and National Informatics Centre, launched by the Government ofIndia in 2009 in collaboration with the states.

Materials & Methods

It is a hospital based Descriptive Study with Retrospective study design under Dept.of OBG in GMC, Bambolim during period of 1st October 2019 to 1st January 2020. Universal sampling done by using Census method. Number and Percentage used for categorical variables for data analysis.

Inclusion criteria: Antenatal mothers visiting the OPD and admitted in ward, under Department of OBG during January 2017 to January 2019.

No exclusion criteria

Results

We have studied about stillbirths in our setting during 2017-2018 and results are as follows.

Total of 213 stillbirths recorded among them 106 in 2018 and 107 in 2017.

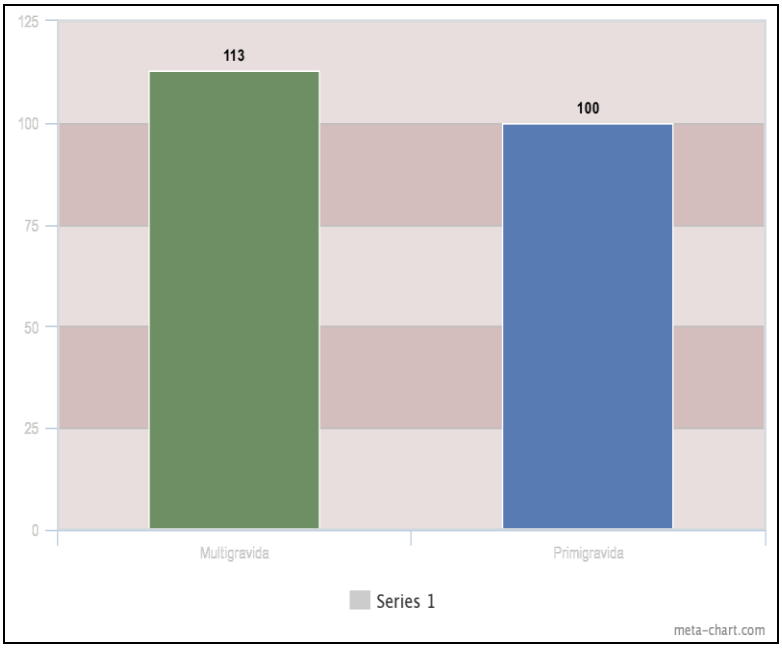

Fig 1: Stillbirths during study period is seen more among multigravidas (53% i.e 113) than primigravida(47%).

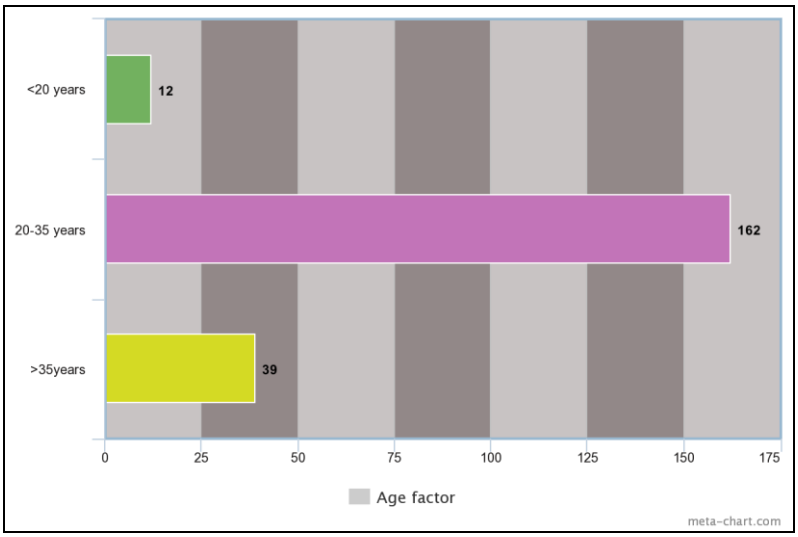

Fig 2: Still birth observed are 5.6% (12) in mother's of age <20years, 76%(162) in mother's of age 20-35years and 18.4%(39) in mother's aged more than 35years.

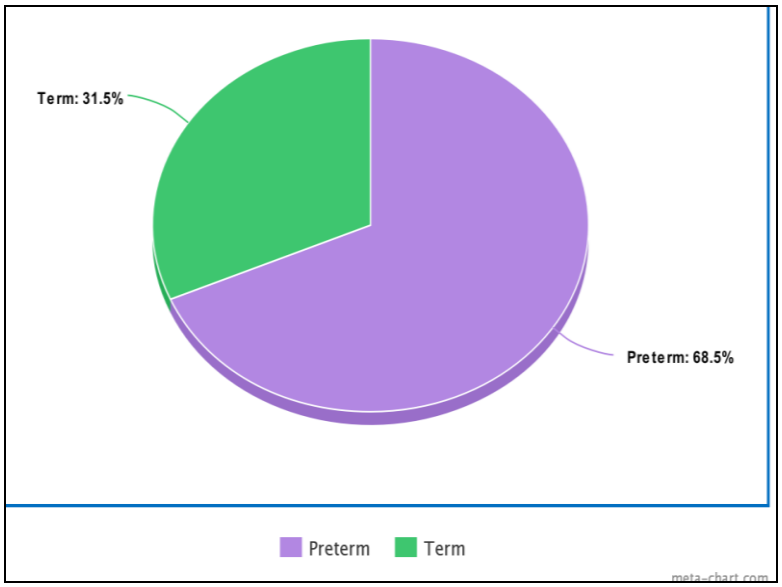

Fig 3: Stillbirths observed are majority among preterms (68.5%) and 31.5%in term babies.

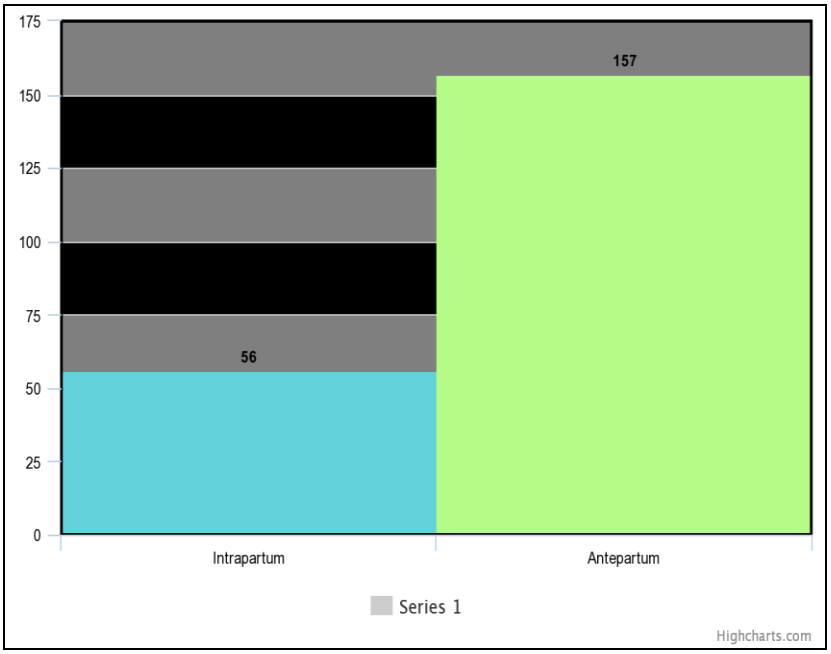

Fig 4: Majority are antepartum 73.7%(157) and 27.3%(56)are intrapartum

Table 1: In our study 8%(17) babies were anomalous whereas 92%(196)are having no anomalies detected in them.

Anomalies detected	No anomalies detected
17	196
8%	92%

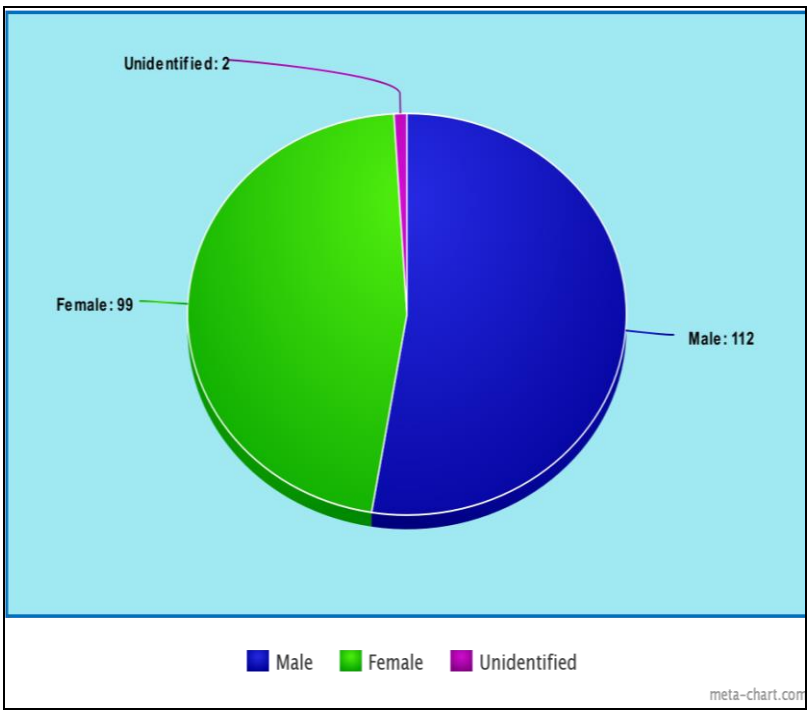

Fig 5: Among stillbirths observed in the study period 52.5%(112) are males, 46.5%(99) are Females and 1%(2) had unidentified sex.

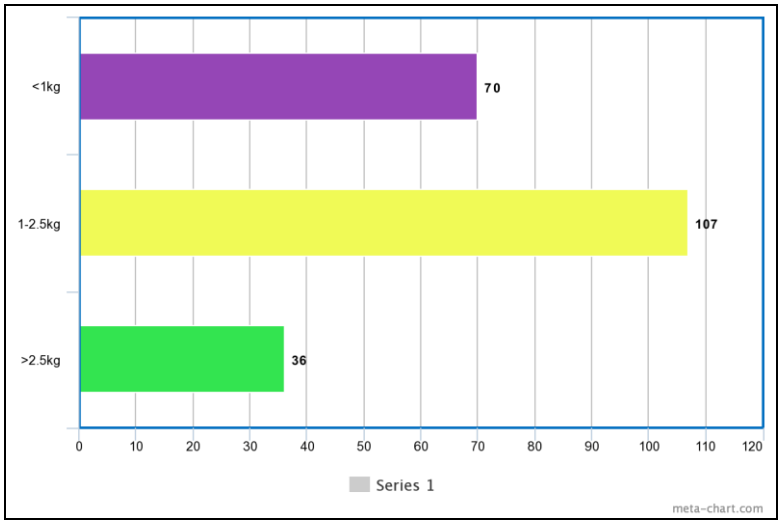

Fig 6: Among all stillbirths 33%(70)babies were <1kg, 50%(107)were between 1-2.5kg, 17%(36)were more than 2.5kg.

Table 2: Among all stillbirths during study period 24.5%(52)were macerated stillborns whereas majority of them 75.5%%(161) were fresh stillborns.

Fresh stillborn	Macerated stillborn
161	52

During study period we thoroughly analized probable cause of every stillbirths. 28.6% (61) being unknown, known causes were 5.6% (12) MASF, 17.3% (37) abruption, 20.6% (44) prematurity and severe iugr, 5.2%% (11) anomalies, 10.7% (23) hypertensive disorders of pregnancy and others 12% (25). Other causes include cord loop around fetal neck, uterine rupture, fetal hydrops, AFD and Doppler changes etc.

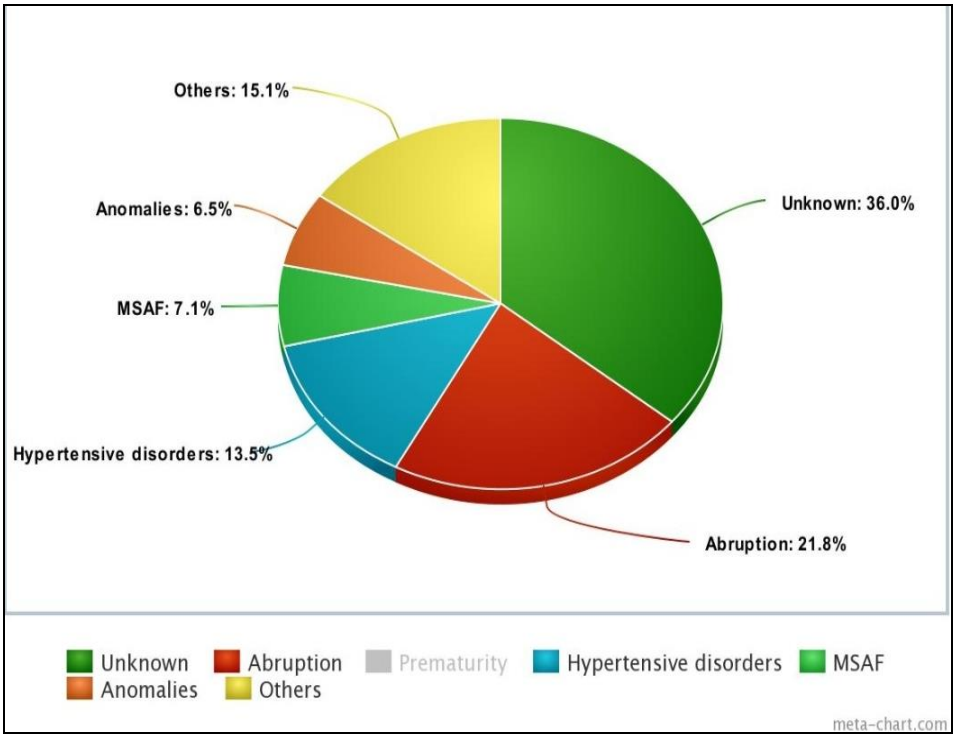

Fig 7: Causes of stillbrth

Maternal risk factors which can attribute to stillbirths are also analyzed. Majority of the stillbirths are associated with severe preeclampsia (58mothers). Other factors are Eclampsia in 10, Gestational hypertension in 9, chronic hypertension in 5, GDM in 16, ODM in 1, maternal anaemia in 7, PROM in 5, Hypothyroidism in 6, pyrexia in 6 and 10other risk factors. Other risk factors seen are rupture uterus, SLE, APLAS, APH etc.

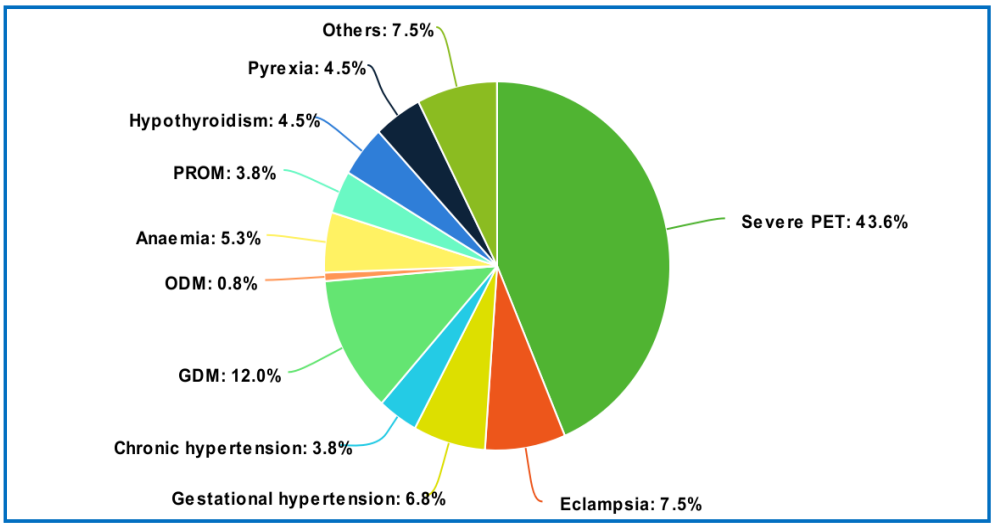

Fig 8: Maternal risk factors involved

Discussion

The etiology of stillbirth is known to be multifactorial, diverse and in many cases unexplained.

In our study stillbirths were seen more in multigravida than primigravida (53% v/s 47%).

Stillbirths are known to be more common in women in the age group >35 yrs of age. However in our review, the highest percentage of stillbirths was seen in the age group 20-35 yrs (76%) followed by >35 yrs (18.4%).

Though the literature shows the prevalence of stillbirths to be 0.09% at term, in our study, the occurrence of stillbirths showed much incidence (31.5%).

10-20% of the stillbirths are attributed to fetal congenital anomalies in previous studies. In our study 8% of the stillbirths were seen to be associated with fetal anomalies.

50% of the stillbirths are seen to occur during the intrapartum period, in previous studies. In contrast, in our study 27.3% of the studies are seen to occur intrapartum.

Literature shows that the cause of stillbirths, remained unexplained in 25-60% of the cases. However in our review, no cause could be identified in 36% of the cases.

Half of the stillbirths were due to IUGR as per previous studies.In our study, 83% the stillbirths were due to IUGR and prematurity.

Literature shows that 10% of the stillbirths were attributed to maternal medical illness, most common being hypertensive disorders of pregnancy and diabetes mellitus. 4-9% of stillbirths occur in patients with hypertensive disorders of pregnancy, with the risk increasing with increasing severity of hypertension. Also hypothyroidism has been seen to have a contributory effect on the occurrence of stillbirths, by increasing the incidence of hypertension and IUGR.

In our study the most common maternal medical illness associated with stillbirth was hypertensive disorders of pregnancy, among which severe preeclampsia (43.6%) had the greatest association with stillbirths. And the lowest incidence was among patients with chronic hypertension (3.8).

12.8% of the stillbirths were seen to be in patients with gestational diabetes mellitus and overt diabetes mellitus.

4.5% of the stillbirths were in patients with hypothyroidism.

Conclusion

A significant proportion of stillbirths are preventable by adequate antenatal care. Female literacy and health education will increase the awareness about antenatal care. The importance adequate antenatal care and identification of high-risk cases, timely referral and promotion of hospital deliveries needs to be emphasized among the medical and paramedical personnel at the first point of contact with the pregnant women. Prompt care by well-equipped tertiary centers and periodic departmental audits will help achieve the goal of reducing stillbirths. Notification of still births will give us the exact figures & help us understand the neonatal health indicators. Realization of the seriousness of the problem will help us work towards the solutions.

- The occurrence of stillbirths can be partly prevented by educating women in reproductive age group to complete family at earlier age (<35 yrs), quit smoking and improve nutrition and lifestyle.
- Early diagnosis and beginning prompt management of medical illnesses diagnosed in pregnancy, such as gestational hypertension, gestational diabetes mellitus, hypothyroidism can prevent majority of stillbirths.
- More frequent antenatal OPD visits should be adviced to mothers with high risk pregnancy such as IUGR, bad obstetric history, maternal medical illnesses and those with history of stillbirths.
- Antenatal tests for assessment of fetal well-being such as biophysical profile, non stress test and ultrasonography should be carried out more frequently in such cases and prompt management in case of early detection of any abnormality can prevent stillbirths.
- Vigilant monitoring of patients in labor room, using cardiotocography, especially for high risk cases can avoid majority of intrapartum stillbirths.

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