

Maternal, Foetal And Placental Conditions Associated With Stillbirth: An Exploratory Study.

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Received: November 2017

Accepted: November 2017

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ABSTRACT

Background: Stillbirth constitutes about 60% of the perinatal deaths. And this is an event which has always challenged the obstetricians for decades. Various maternal, foetal and placental factors may result to stillbirths. Yet, in spite of the modern facilities available and advances made in the medical field, many times no contributing factors can be attributed to the exact cause of stillbirth and refusal of autopsy examination seals the chapter, with the cause of stillbirth remaining unexplored. **Objective:** The objective of the current study was to explore the maternal, foetal and placental conditions associated with stillbirth and to ascertain the common causes of stillbirth. **Methods:** A hospital-based prospective study was conducted in the Department of Obstetrics and Gynaecology, Regional Institute of Medical College, Imphal, Manipur in the year 2003. At the time of admission, after obtaining informed verbal consent, a detailed history was taken followed by thorough physical examination and routine investigations were done for all the admitted patients in the antenatal ward. After delivery, all the women who had stillbirth were approached again to undergo special investigations like blood sugar estimation, VDRL test, urine examination for culture and sensitivity, ELISA for HIV and TORCH antibodies, Widal test, liver function tests and kidney function test. Based on the above findings, the stillbirths were analysed as macerated stillbirths and fresh stillbirths. **Results:** Only 43 women out of all the 100 women who had stillbirths could be investigated for TORCH antibodies. Out of these 43 women, 4 (9.3%) women were positive for Ig M toxoplasma antibody, 3 (7.0%) women were positive for Ig M Rubella antibody, 10 (23.3%) women were positive for Ig M CMV and 9 (20.9%) women were positive for Ig M HSV I & II indicating present infection. Ig G antibody alone was positive in 25 (58.1%) women for toxoplasmosis, 29 (67.4%) women for Rubella, 31 (72.1%) women for CMV and 20 (67.4%) women for HSV I & II indicating past infection (Table 1). Forty-eight women underwent VDRL testing and 08 (20%) women were found to be positive. Only 20 women gave consent for their placenta to undergo histopathological examination. Among these the commonest histological finding was syncytial knots (70%). Maternal anaemia (78%) was by far the commonest medical condition associated in women who either had macerated or fresh stillbirth. And accidental haemorrhage with or without placenta previa and prolonged/obstructed labour were the common conditions associated with stillbirth. The most probable causes of stillbirth assigned for all the 100 stillbirths, made after careful clinical consideration were intra-partum asphyxia (59%), foetal asphyxia (19%), unexplained intra-uterine deaths (15%) and congenital malformations (7%). **Conclusion:** Proper antenatal care for screening high risk factors and management thereof and educating the women to overcome the fear for hospital delivery are the needs of the hour. Also, a constant supervision by the senior staffs and their availability for consultation while conducting deliveries in the medical institutions may prevent a sizeable number of stillbirths. Vaginal delivery of difficult and breech delivery may be avoided as far as possible. Instead, Caesarean section should be opted.

Keywords: Accidental haemorrhage, Stillbirth, TORCH

INTRODUCTION

Several major achievements have been made in global health in the last two decades. One of these major achievements is halving the under-five mortality in children, dropping from 90 to 43 deaths per 1,000 live births between 1990 and 2015.^[1] This prompted the United Nations to target it to be made at least as low as 25 per 1,000 live births as one of Sustainable

Development Goals (SDGs) to be achieved by the year 2030.^[2] Significant reduction in child mortality has been made but the progress in reducing perinatal mortality is rather slow. In order to achieve the aforementioned SDG target, it is vital to reduce the perinatal mortality.

Stillbirth constitutes about 60% of the perinatal deaths.^[3] And this is an event which has always challenged the obstetricians for decades. Various maternal, foetal and placental factors may result to stillbirths.^[4] The roles of many maternal factors like low socio-economic status, extremes of age, not having adequate antenatal care, anaemia, hypertension and foetal factors like multiple pregnancy, complicated presentation, preterm delivery and low birth weight have already been established.^[4-10] But, in

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spite of the modern facilities available and advances made in the medical field, many times no contributing factors can be attributed to the exact cause of stillbirth and refusal of autopsy examination seals the chapter, with the cause of stillbirth remaining unexplored.

Objective

The objective of the current study was to explore the maternal, foetal and placental conditions associated with stillbirth and to ascertain the common causes of stillbirth.

MATERIALS AND METHODS

The present study is a part of a bigger study conducted to find out the magnitude of stillbirth which was a hospital-based prospective study taken up in the Department of Obstetrics and Gynaecology, Regional Institute of Medical College, Imphal, Manipur in the year 2003. Out of 5,588 women who delivered during the study period, those who had stillbirth were included as the study-subjects. On admission, after obtaining informed verbal consent, a detailed history was taken followed by thorough physical examination and routine investigations from all the admitted patients in the antenatal ward. After delivery took place, all the women who had stillbirths were approached again to undergo special investigations like blood sugar estimation, VDRL test, urine examination for culture and sensitivity, ELISA for HIV and TORCH antibodies, Widal test, liver function tests and kidney function tests. For those who gave consent, screening for TORCH antibodies was done by using Equipar srl, Italy. The activity index (AI) values of the controls and serum samples were read from the standard curve prepared for each run. In *Toxoplasma gondii*, a titre of >16.5 IU/ml was taken as positive and a titre of 15-16.5 IU/dl was taken as equivocal. In case of rubella, titres of >20 IU/ml and 10-20 IU/ml were considered as positive and equivocal respectively. The corresponding values for Cytomegalovirus (CMV) and Herpes simplex virus (HSV) were >1.1 and 0.11-1.1 AI respectively. In case of Rh-negative mothers Coomb's test (both direct and indirect) cord blood examination for haemoglobin estimation, ABO blood grouping, Rh typing, serum bilirubin and peripheral blood smear examination for RBC morphology of the baby were done.

Histopathological examinations of the placenta were done in cases where there were visible signs of abnormality of the placenta after taking consent from the parents. Autopsy examination was also planned to be done for the dead baby.

The approval for the study was obtained from the Institutional Ethics Committee, RIMS. Based on the above findings, the stillbirths were analysed as

macerated stillbirths and fresh stillbirths. Only descriptive analysis was done by using SPSSv17.

RESULTS

A total number of 100 women had stillbirths during the study period. Of these, only 43 women consented to undergo screening test for TORCH Ig G and Ig M antibodies. Out of these 43 women, 4 (9.3%) women were positive for Ig M toxoplasma antibody, 3 (7.0%) women were positive for Ig M Rubella antibody, 10 (23.3%) women were positive for Ig M CMV and 9 (20.9%) women were positive for Ig M HSV I & II indicating present infection. Ig G antibody alone was positive in 25 (58.1%) women for toxoplasmosis, 29 (67.4%) women for Rubella, 31 (72.1%) women for CMV and 20 (67.4%) women for HSV I & II indicating past infection (Table 1). Forty-eight women underwent VDRL testing and 08 (20%) women were found to be positive.

Table 1: Serological analysis for TORCH antibodies in women with stillbirths (n=43).

Serological analysis	No. of positives	Positivity (%)
Toxoplasma gondii		
Ig M alone/Ig M + Ig G	4	9.3
Ig G alone	25	58.1
Rubella		
Ig M alone/Ig M + Ig G	3	7.0
Ig G alone	29	67.4
CMV		
Ig M alone/Ig M + Ig G	10	23.3
Ig G alone	31	72.1
HSV I & II		
Ig M alone/Ig M + Ig G	9	20.9
Ig G alone	29	67.4

Only 20 women gave consent for their placenta to undergo histopathological examination. Among these the commonest histological finding was syncytial knots (70%). [Table 2]

Table 2: Histopathology of placenta (n=20).

Histological findings	Number	Percentage
Syncytial knots	14	70
Fibrinoid necrosis of villi	5	25
Ischaemic necrosis of villi	4	20
Cytotrophoblastic proliferation	1	5
Oedema of stroma	3	15
Signs of immaturity	4	20
Degenerative changes	4	20
Chorioamnionitis	2	10
Calcification	1	5
Congestion in blood vessels of villi	4	20
Fibrinoid necrosis, concentric hypertrophy & obliterative changes	3	15
Intervillous haemorrhage	1	5

[Table 3] gives the distribution of conditions associated with stillbirth among the 100 study-women. 78 (78%) women had at least one medical condition. Maternal anaemia (78%) was by far the commonest medical condition associated in women

who either had macerated or fresh stillbirth. And accidental haemorrhage with or without placenta previa and prolonged and obstructed labour were the common conditions associated with stillbirth.

Table 3: Maternal medical and obstetric conditions associated with stillbirth.

Maternal/ Obstetric conditions	Stillbirth		
	Macerated	Fresh	Total (%)
Medical conditions			
PIH	14	10	24 (24)
Anaemia	28	50	78 (78)
Diabetes	3	-	3 (3)
Pyrexia	5	-	5 (5)
SLE	1	-	1 (1)
Jaundice	1	-	1 (1)
Herpesgestationis	1	-	1 (1)
UTI	1	3	4 (4)
Obstetric conditions			
Accidental haemorrhage	4	17	22 (22)
Prolonged & obstructed labour	-	23	23 (23)
PROM	3	6	9 (9)
Tight cord around neck	4	4	8(8)
Multiple pregnancy	3	2	5(5)
Cord prolapse	-	4	4 (4)
Post-term labour	2	-	2 (2)

The most probable causes of stillbirth assigned for all the 100 stillbirths, made after careful clinical consideration were intra-partum asphyxia (59%) foetal asphyxia (19%), unexplained intra-uterine deaths (15%) and congenital malformations (7%).

DISCUSSION

Primary infection with TORCH complex in pregnant women can lead to adverse outcome including intra-uterine death of foetus. Positivity rate of these antibodies varies in different study places of the country. It was as high as 27% for toxoplasmosis (Saxena K et al, 1993),^[11] or as low as 1.4% (Pal and Agarwal, 1979). In the present study, the positivity percentage was found to be 9.3% which is comparable with study findings made by Turbadkar D et al.^[12] The present study seropositivity rate of 6.98% for Rubella is slightly lower than as found by Turbadkar D et al but was higher than reported by Raghunandan C et al.^[12,13] The seropositivity rate for CMV from the present study was 23.26% which was higher than that of Raghunandan C et al.^[13] Difference in the study places might explain the different findings. For the same reason the higher seropositivity rate of HSV in the present study (20.93%) was found to be much higher than as reported by Raghunandan C et al. Mixed infections were noted in six out of the 43 women screened for TORCH. Similar observations of mixed infection have also been made in earlier studies by other researchers.

The syncytial knotting seen in 70% of cases can be significantly correlated with intra-uterine death (IUD). Similar finding was also made by Masodkar AR et al.^[14] Syncytial knots are important signs of

maturity of placenta but its presence in large numbers is signifies preterm IUD. However, it does not pinpoint to any causative factor. Other histological changes are by and large non-specific and may not be significant towards detection of the causation of IUD. Thus, the 20% of infarction seen in the present study might not be a useful indicator. In the current study 16.67% of the women who had stillbirths were found to be VDRL reactive. This is in agreement with the study finding made by Raghunandan C et al.^[13] Because of its high incidence all pregnant women must be screened by specific serological test for syphilis in early pregnancy.

All the study women with IUD were screened for HIV and all were found to be negative. This finding is comparable with the study finding of no increased risk of IUD in women with HIV as reported by Moyo SR et al.^[15]

The frequent occurrence of medical conditions like anaemia, PIH and diabetes is responsible for intra-uterine death of the foetus. The other medical conditions also frequently associated with IUD were accidental haemorrhage, placenta previa and prolonged and obstructive labour. Twins and breech delivery also contributed to IUD, the incidence of which cannot be changed. The factors responsible for prolonged and obstructive labour might be due to ignorance on the part of the patient/patient's party, lack of facilities for antenatal care in the villages and transport facilities.

Death due to asphyxia and anoxia was found to be very high in the present study. Reduction in the proportion of asphyxia is possible by early appreciation of cord compression and other complications and prompts management of cases. The majority of foetal deaths as found out from the present study were severe anaemia, antepartum haemorrhage and prolonged/obstructed labour. Antepartum haemorrhage and PIH are all manageable factors whereas maternal severe anaemia is a preventable factor.

Congenital anomalies accounted for 8% of all the stillbirths in the present study. Genetic counselling and the opportunity for further research in this area offer an exciting challenge for the future. Clear understanding of the foetal growth and application of modern tests for the same, may resolve the problem of stillbirth in future.

CONCLUSION

The preventable factors for stillbirth can be attributed insufficient antenatal care and failure of timely admission in hospitals. This may be due to the fact that most of women from villages and poorly educated and are reluctant to consult a doctor during pregnancy for delivery purposes. Proper antenatal care for screening high risk factors and management thereof and educating the women to overcome the

fear for hospital delivery are the needs of the hour. Also, a constant supervision by the senior staffs and their availability for consultation while conducting deliveries in the medical institutions may prevent a sizeable number of stillbirths. Vaginal delivery of difficult and breech delivery may be avoided as far as possible. Instead, Caesarean section should be opted.

More detailed studies are recommended to ascertain the underlying cause of many of the unexplained deaths.

How to cite this article: Devi YG, Singh KB. Maternal, Foetal And Placental Conditions Associated With Stillbirth: An Exploratory Study. *Ann. Int. Med. Den. Res.* 2018; 4(1):CM05-CM08.

Source of Support: Nil, **Conflict of Interest:** None declared

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