Original Research Article

Histopathological study of umbilical cord and placental membranes in clinically suspected cases of chorioamnionitis

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Abstract

Background: According to the World Health Organization, approximately four million neonates die annually with a global neonatal mortality rate of 23/1,000 live births. About a million of these deaths are attributable to neonatal infections. The placenta is the organ that links mother and foetus during pregnancy. It forms a barrier to toxins and infective organisms. Chorioamnionitis is diagnosed on the basis of either clinical and/or histological findings. Histological chorioamnionitis is the gold standard for defining the maternal and fatal inflammatory responses to microbial organisms in the amniotic fluid. **Objective:** The aim of the study was to assess the utility of histopathological study of of umbilical cord and placental membranes in clinically suspected cases of chorioamnionitis **Material and Methods:** This was a prospective study carried out in the Department of OBG, Kodagu institute of medical sciences, Madikeri, from June 2015 to May 2017. All the cases of clinically suspected chorioamnionitis were registered for the study. Histopathological examination of placental membranes and umbilical cord was carried out to detect the presence of histological chorioamnionitis (HCA). **Results:** In our study HCA was present in 63% and funicitis in 57% of clinically suspected cases of chorioamnionitis. **Conclusion:** Histopathological examination of umbilical cord and placental membranes is an accurate method to assess the presence of histological chorioamnionitis and neonatal sepsis.
Key Words: Placental membranes; Umbilical cord; Histological chorioamnionitis; Funisitis.

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Email: somugynaec@gmail. com
Received Date: 02/08/2018 Revised Date: 19/09/2018 Accepted Date: 20/10/2018
DOI: https://doi.org/10.26611/1012826

Access this article online	
Quick Response Code:	Website: www. medpulse. in
	Accessed Date: 12 November 2018

INTRODUCTION

Neonatal septicaemia continues to be a major cause of morbidity and mortality in our country. It is one of the major causes of neonatal mortality in the developing countries contributing to 15% of all neonatal deaths.[1] The placenta is the organ that links mother and foetus during pregnancy. It plays a crucial role in foetal growth and development. In addition the placenta forms a barrier to toxins and infective organisms. Chorioamnionitis is diagnosed on the basis of either clinical and/or histological findings.[2] Histological chorioamnionitis is the gold standard for defining the maternal and fatal inflammatory responses to microbial organisms in the amniotic fluid.[3] Potential benefits of pathological examination of the placenta include the evaluation and explanation of the aetiology associated with an adverse pregnancy outcome, the formulation of a plan of management for future pregnancies, the capability to predict the risk for long-term neonatal neurodevelopmental problems, and medicolegal risk assessment of an adverse pregnancy outcome. This has led some experts to suggest that placental pathology should be a routine component of obstetric and neonatal care.[4]

How to cite this article: Somashekar H K, Rashmi B, Manjunatha S. Histopathological study of umbilical cord and placental membranes in clinically suspected cases of chorioamnionitis. *MedPulse – International Journal of Gynaecology.* November 2018; 8(2): 65-68. http://medpulse.in/Gynacology/index.php

MATERIAL AND METHODS

This was a prospective study carried out in the Department of OBG, Kodagu institute of medical sciences, Madikeri, from June 2015 to May 2017. All the cases of clinically suspected chorioamnionitis were registered for the study. Histopathological examination of placental membranes and umbilical cord was carried out to detect the presence of histological chorioamnionitis.

Inclusion Criteria

- Pregnant women with history of,
- Preterm delivery
- Premature rupture of membranes
- Uterine tenderness on palpation
- Fever during the time of labour
- Increased white blood cell count of mother
- Foul smelling amniotic fluid
- Tachycardia of the foetus

Exclusion Criteria

- Full term normal delivery
- Post term pregnancy
- Intrauterine death and still birth cases
- Maternal diabetes mellitus, hypertension
- Presence of congenital anomalies of baby

RESULTS

In the period from June 2015 to May 2017, 100 total cases of placental membranes, umbilical cord of clinically suspected case of chorioamnionitis were collected.

Age distribution: The patients were between the age of 19 - 39 years and the maximum numbers of patients were in the age group of 26 yrs to 32 yrs.

Table 1: Age distribution of study participants

Age distribution	Frequency	Percentage	Mean ± SD
19-25	31	31 %	
26-32	62	62 %	
33-39	7	7 %	26. 83 ± 3. 908
Total	**100**	**100 %**	

Parity of the mother: Out of total 100 cases 41 are primipara and 59 are multipara.

Table 2: Distribution of study participants according to the parity

Parity of the mother	Frequency	Percentage
Primiparity	41	41 %
Multiparity	59	59 %
Total	**100**	**100 %**

Gestational age of mother: Out of 100 patients 35 were preterm delivery and 65 were term delivery.

Table 3: Distribution of study participants according to the gestational age in weeks at the time of labour

Gestational age	Frequency	%	Mean ± SD	Median age
Preterm (≤ 36 weeks)	35	35 %		
Term (≥ 37 weeks)	65	65 %	36. 25 ± 2. 5	37 weeks
Total	**100**	**100 %**		

Clinical profile of mother: Maximum numbers of cases were preterm delivery followed by PROM.

Table 4: Distribution of study participants according to the clinical profile

Clinical profile of study participants	Frequency	Percentage
Preterm delivery	35	35 %
PROM	32	32 %
Tachycardia foetus	12	12 %
Increased WBC- mother	9	9 %
Uterine tenderness	5	5 %
Foul smelling amniotic fluid	4	4 %
Fever during labour	3	3 %
Total	**100**	**100 %**

Results of placental membranes: On histopathological examination 63 were positive and 37 were negative for chorioamnionitis.

Results of umbilical cord: On histopathological examination 57 were positive and 43 were negative for funisitis.

Table 5: Clinical profile of study participants and its association with CA

Clinical profile	CA (Test- HP)			p value
	Present	Absent	Total	
Preterm delivery	24 (68. 6 %)	11 (31. 4 %)	35	
PROM	14 (43. 75 %)	18 (56. 25 %)	32	
Tachycardia foetus	7 (58. 3 %)	5 (41. 7 %)	12	
Increased WBC- mother	9 (100 %)	0	9	
Uterine tenderness	3 (60 %)	2 (40 %)	5	
Foul smelling amniotic fluid	3 (75 %)	1 (25 %)	4	*
Fever during labour	3 (100 %)	0	3	
Total	**63**	**37**	**100**	

Figure 1:

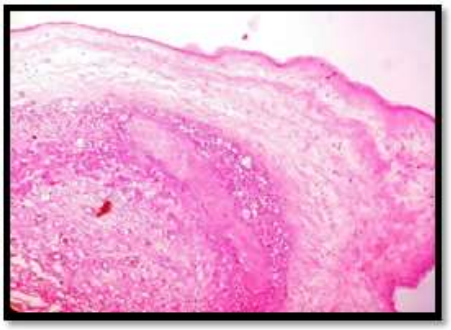

Figure 2:

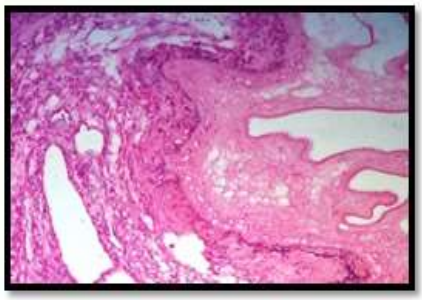

Figure 3:

Figure 4:

Figure 1: Umbilicalcord and placental membranes ; **Figure 2:** Subchorionic infiltration of neutrophils ; **Figure 3:** Band of neutrophils in the chorion; **Figure 4:** Neutrophils in the umbilical artery

DISCUSSION

Acute inflammatory lesions of the placenta have been considered to reflect the presence of amniotic fluid infection. Chorioamnionitis is the major cause of spontaneous preterm birth and other neonatal complications. [5]

Clinical profile of pregnant women Age distribution and parity of mothers: In the present study 66. 1% of patients in the age group 26 to 32 years were having either HCA or funisitis. According to the parity of mother 75. 6% of primipara cases were showing inflammatory response.

Gestational age at delivery: The mean gestational age of participants was 36. 25 weeks and the median gestational age was 37 weeks, which is similar to the study done by Mahe E *et al,* in their study the mean gestational age was 36. 4 weeks and the median gestational age was 39. 5 weeks.[6] In our study the incidence of intrapartum fever was 3% and increased WBC count of mother is 9% which is correlating with Catherin A *et al* as shown in the table.[7] In our study the incidence of uterine fundal tenderness among clinically suspected cases of chorioamnionitis is 5%, which is correlating with the study done by Smulian JC *et al*.[8] Tita A *et al* observed that maternal tachycardia occur frequently in chorioamnionitis being reported in 50-80%. Uterine fundal tenderness and foul odour of the amniotic fluid was reported in 25% of PROM cases, where as 8% of term births.[9] Park CW *et al* concluded that, there were no significant difference in parity, maternal age, and clinical chorioamnionitis with Preterm labour and PROM. Patients with preterm PROM had a significantly higher rate of intra-amniotic infection, acute HCA and acute HCA with funisitis.[10] In our study on correlating the clinical profile of cases, 68. 6% of preterm cases had HCA.

Table 6: Comparison of prevalence of HCA with clinical chorioamnionitis

Reference study	Catherine	Smulian[11]	Poposki	Present study
Clinical chorioamnionitis	46	139	57	100
Histological chorioamnionitis	40	86	32	63

In our study HCA was present in 63%, and funicitis in 57% of clinically suspected cases of chorioamnionitis.

CONCLUSION

Histopathological examination of placental membranes and umbilical cord is an accurate method to assess the presence of histological chorioamnionitis and neonatal sepsis, especially in the critical postpartal period, in order to effectively manage the conditions associated with the maternal and neonatal infections.

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Source of Support: None Declared
Conflict of Interest: None Declared