

Maternal Demography and Neonatal Outcomes in Term Pre Labour Rupture of Membranes Versus Spontaneous Labour Preceding Ruptured Membranes in Lagos, Nigeria: A Comparative Study

Yusuf Abisowo Oshodi¹, Muyideen Oladipo Oyedeko¹, Tawaqualit Abimbola Ottun¹, Fatimat Motunrayo Akinlusi¹, Joy Onyinyechi Chionuma¹

Department of Obstetrics and Gynaecology, Lagos State University Teaching Hospital, Ikeja

Muhammad Adebayo Salisu²

Department of Paediatric and Child Health,
Lagos State University Teaching Hospital, Ikeja.

CORRESPONDENCE: Dr. Yusuf Abisowo Oshodi

Department of Obstetrics and Gynaecology, Lagos State University Teaching Hospital, Ikeja

Abstract:-

Background: Term prelabour rupture of membranes complicates about 5% to 10% of term pregnancies and imposes therapeutic challenges upon the managing obstetrician. While spontaneous labour followed by ruptured membranes is the accepted default pathway towards delivery at term, comparative studies on term PROM and spontaneous onset of labour preceding ruptured membranes are scarce globally.

Objective: To compare maternal socio-demography and neonatal outcomes of term PROM versus spontaneous onset of labour before membrane rupture in our tertiary facility.

Methods: A prospective comparative study of 300 subjects allocated into the study group comprising 150 subjects with prelabour rupture of membranes and the other 150 subjects with spontaneous labour before membrane rupture as the control group. Data were obtained on maternal sociodemographic characteristics and neonatal outcomes in both groups. Epi-info statistical software was deployed for data analysis.

Results: The incidence of premature rupture of membranes was 9.23%. Term PROM was highest in the age group 20-29 years while subjects with low socioeconomic status accounted for 58.7% in the study group. The study group had higher caesarian delivery than the control (22.6% versus 8.0%; $P < 0.001$). One hundred and thirty-nine (139) babies of subjects in the study group had APGAR scores ≥ 7 compared to 149 babies of subjects in the control group ($P < 0.001$). More neonates in the study group were admitted into the Neonatal Intensive Care Unit (NICU) compared to the control (6.7% versus 0.7%; $P = 0.025$). Seven neonates in the study group had Neonatal sepsis compared to none in the control group ($P < 0.01$). Similarly, three perinatal death were recorded in the study group compared to none in the control group ($P = 0.06$).

Conclusion: Actively managed term PROM was significantly associated with unbooked maternal status, poorer Apgar scores, higher rate of caesarian delivery, and increased perinatal morbidity and mortality compared to spontaneous labour before membrane rupture.

Keywords:- term prelabour ruptured membranes, spontaneous labour before membrane rupture, maternal demography, neonatal outcomes.

I. INTRODUCTION

Term prelabour rupture of membranes (PROM) is the spontaneous rupture of the chorioamniotic membranes prior to the onset of labour at or after 37 weeks of gestation [1]. It complicates about 5% to 10% of term pregnancies and imposes therapeutic challenges upon the managing obstetrician [2]. While premature rupture of membranes occurs during pregnancy irrespective of gestational age, about 60% occur at term [3].

Different mechanisms have been proposed to explain the occurrence of PROM. The chorioamniotic membranes though resilient become progressively less elastic as term approaches from forces associated with an increase in uterine size, contractions, and fetal movement. [4] Several predisposing factors have been implicated in the aetiology of PROM such as infections, individual immunological reactivity, polyhydramnios, multifetal pregnancies, cigarette smoking, substance abuse, strenuous activities, cervical injury, coital activity, women's exposure to diethylstilbestrol, connective tissue disorder and obstetric procedures like amniocentesis [5,6]. Fetal risks include fetal distress due to cord prolapse, cord compression, placental abruption, mechanical difficulty in delivering the fetus due to reduced liquor volume, and a 2-4% risk of neonatal sepsis [7].

When the chorioamniotic membrane ruptures, its barrier to infection of the fetus and maintenance of sterility of the amniotic fluid is lost. In view of being a deposit for prostaglandins, there is a possible enhancement of labour. With the onset of PROM, intrauterine infection, cord prolapse, and placental abruption incidentally complicate the pregnancy culminating in endometritis or puerperal sepsis. [8] Risk of neonatal sepsis, birth asphyxia, operative and instrumental intervention as well as neonatal death increase.[9]

Despite these increases in prenatal mobility and mortality, there is no available standard for diagnosis. Diagnostic evaluations range from the history of sudden gush of fluids, direct visualization of liquor pooling in the posterior fornix or egress with or without Valsalvamanuever on speculum examination as well as confirmation of the amniotic fluid. Various options of diagnosis with different ranges of sensitivity and specificity in the confirmation of PROM include the use of Nitrazine paper, Fern test, Indigo-carmin or Evans blue dye, ultrasound or use of Placenta Alpha Macroglobulin-1(PAM-G) [10].

While the management of term PROM at term is still controversial between expectant and aggressive methods, it requires counseling the woman and her relatives on the benefits and risks of expectant management versus active management. Although; spontaneous labour followed by ruptured membranes is the accepted default pathway towards delivery at term, comparative studies on term PROM and spontaneous onset of labour preceding ruptured membranes are scarce globally. An extensive literature search did not reveal any research comparing both in Africa. This study was designed to compare maternal demography and neonatal outcome of term PROM versus spontaneous labour preceding ruptured membranes in our tertiary facility.

II. MATERIALS AND METHODS

This was a prospective comparative study conducted between subjects admitted with prelabour rupture of membrane (study group) and those who presented with spontaneous labour before rupturing of membrane (control group) from 1st of December 2017 to 30th November 2018. The study site was the labour ward of the Department of Obstetrics and Gynaecology, Lagos State University Teaching Hospital Ikeja, Lagos. Ethical clearance was obtained from our institution's Health Research and Ethics Committee. Informed consent was obtained from each subject before inclusion in this study. The gestational age was calculated from the date of the last menstrual period (LMP) using Naegele's rule and/or the early dating ultrasound scan in the first half of pregnancy.

Inclusion criteria for subjects with prelabour rupture of membranes include gestational ages between 37 and 41 weeks, spontaneous rupture of membranes, direct observation of copious amniotic fluid in posterior fornix or egress from cervical os on sterile speculum examination confirmed by Nitrazine paper, cervical dilatation less or equal to than 3cm, effacement less than 80% and absent fetal membranes.

Exclusion criteria include gestational age below 37 weeks, non-vertex presentation, meconium or blood-stained liquor, cephalo-pelvic disproportion or contracted pelvis, multiple pregnancies, pregestational or gestational diabetes, previous uterine surgeries, cardiac diseases, chronic renal failure, hypertensive disorders, abnormal placentation on ultrasound scan, intrauterine fetal death, fetal macrosomia, fetal congenital malformations, non-reassuring fetal rate pattern, and intrauterine growth restriction.

The sample size was calculated by using the formula:

$$n = \frac{z^2 pq}{d^2}$$

where

n = number of sample

z = standard error with a level of confidence at 1.96

p = estimated prevalence of prelabour rupture of membranes is 10% [2]

q = 100 – p

d = accepted sample error at 5%

thus the sample size for this study was calculated:

$$n = \frac{1.96^2 \times 0.1 \times (1 - 0.1)}{0.05^2}$$

$$n = 138$$

To account for attrition, the sample size was rounded off as 150 in each of the study and control groups give 300 subjects. Structured proforma was designed to obtain information on the socio-demography of subjects including age, party, occupation, and booking status. All subjects were admitted into the labour ward following standard clinical evaluation and relevant laboratory investigations according to our labour ward practice. A sterile speculum examination was conducted to confirm the diagnosis. A cervical assessment was performed to assess the Bishop's score. Pre-induction cardiotocography was done in all cases to exclude fetuses with non-reassuring tracings.

Following the recruitment of subjects with prelabour membranes rupture of rupture, the next pregnant subjects that presented in spontaneous labour in active phase on the same day with no history of liquor drainage and examination finding in keeping with intact membrane and fulfilled the criteria above were selected as control. The subjects in the study group with unfavourable cervix had oral misoprostol 50mcg 6hourly up to 4 doses within one hour of confirmation of ruptured membranes. A subsequent dose of misoprostol was not administered following a favourable Bishop's score or onset of labour. In those with favourable cervix and yet to fall into labour, stimulation was commenced with a gravity-fed intravenous oxytocin infusion with 5i.u for nullipara and 2.5i.u for multipara in 500mls of 5% Dextrose saline or Ringer's lactate 6hours after the last misoprostol administration. This was commenced at 10 drops per minute and titrated by an incremental rate of 10 drops every 30 minutes up to 60 drops per minute (equivalent to 40mu/ml) until adequate

contractions of 3 – 4 in 10 minutes lasting 45 – 60 seconds are achieved.

All subjects presenting with prelabour membrane rupture ≥ 12 hours had prophylactic intravenous amoxicillin/clavulanic acid 1.2gm 12hrlyx 2 doses administered while awaiting the result of amniotic fluid microscopy, culture and sensitivity. Where labour stimulation of failed, spontaneous labour did not progress satisfactorily with signs of maternal or fetal compromise, a recourse to caesarian section is made. A paediatrician assessed newborns at the time of delivery and their APGAR scores at one and five minutes were documented.

Neonates of study subjects with ruptured membranes over 24 hours at delivery were admitted into the NICU, commenced on prophylactic antibiotics, and observed for further signs of sepsis. Temperature above normal level (37.2°C), presence of tachycardia (above 160 bpm), presence of tachypnea (above 60 breaths per minute), and WBC count $< 6,000$ were taken as diagnostic criteria for neonatal sepsis. Observations were made regarding the mode of delivery and neonatal outcome with Apgar scores at 1 and 5 minutes recorded. Neonates were examined for any congenital anomaly and followed up till discharge for any adverse outcomes.

Data obtained were analyzed using Epi-info statistical software version 7.0 (CDC-P, Atlanta, USA). Maternal demographic variables were represented with (descriptive statistics such as) frequency, mean and standard deviation. Pearson's Chi-square test was applied to determine the association between the mode of delivery, birth weight, Apgar scores, neonatal intensive care unit (NICU) admission, and neonatal sepsis between the two groups. P-value < 0.05 was considered statistically significant at a 95% confidence interval.

III. RESULTS

Out of the 3,219 deliveries that occurred during the study period, two hundred and ninety-seven (297) of the patients had prelabour rupture of membrane at term giving an incidence of 9.23%. Two hundred and forty-eight of the subjects constituting 82.7% of both study and control groups were booked in our facility. The mean age distribution of the case was 30.28 ± 5.13 years compared to 29.22 ± 5.57 years in the control group ($P = 0.12$). The parity of the subjects in both groups was similar ($P = 0.61$). One hundred and eighty-two of all subjects were unskilled workers with 58.7% in the study group. Nulliparous subjects accounted for 53.3% and 40.3% of the study and control groups respectively. The mean duration of liquor drainage to the onset of labour in the study group was 20.25 ± 16.3 hours. One hundred and twenty-seven subjects (84.7%) in the study group progressed to labour within 24 hours of liquor drainage (Table 1). There was no case of chorioamnionitis reported among the subjects.

One hundred and fourteen (76%) subjects in the study group had spontaneous vaginal delivery compared to 137 (91.3%) subjects in the control. Similarly, 22.6% of subjects in the study group had caesarian delivery compared to 8% in the control ($P < 0.001$). There was a comparable vacuum delivery rate of 1.3% and 0.7% in the study and control groups respectively. The mean APGAR score at 5 minutes of subjects in the study group was 8.04 ± 1.67 compared to 8.57 ± 0.67 . One hundred and thirty-nine (139) neonates of subjects in the study group had Apgar scores greater than 7 compared to 149 neonates of subjects in the control group ($P < 0.001$) (Table 2).

Ten neonates (6.7%) delivered to subjects in the study group were admitted into the NICU compared to one baby 0.7% delivered to subjects in the control group ($P = 0.025$). Seven babies delivered to subjects in the study group were managed for neonatal sepsis but none in the control group ($P < 0.01$). There was three (3) perinatal death in the study group but none in the control group ($P = 0.06$). There were fewer male babies (79) delivered to subjects in the study group compared to 82 male babies in the control ($P = 0.26$) (Table 2).

IV. TABLES

Characteristics	Cases N = 150	Control (n=150)	Chi-Square (X^2)
Age (years)			
10 – 19	1 (0.7%)	4 (2.7%)	$X^2 = 6.0479$ $P = 0.12$
20 – 29	67 (44.7%)	77 (51.3%)	
30 – 39	81 (54.0%)	65 (43.3%)	
40 – 49	1 (0.7%)	4 (2.7%)	
Mean	30.28 ± 5.12	29.22 ± 5.57	
Parity			
0	80 (53.3%)	60 (40.0%)	$X^2 = 0.2637$ $P = 0.61$
1 – 4	69 (46.0%)	90 (60.0%)	
5	1 (0.7%)	0 (0%)	
Occupation			
Unskilled	88 (58.7%)	94 (62.7%)	$X^2 = 1.9597$ $P = 0.38$
Semi-skilled	22 (14.7%)	26 (17.3%)	
Skilled	40 (26.7%)	30 (20.0%)	

Booking status			
Booked	114 (76.0%)	134 (89.3%)	$X^2=7.8413$ $P < 0.001$
Unbooked	36 (24.0%)	16 (10.7%)	
Religion			
Christianity	121 (80.7%)	123 (82.0%)	$X^2 = 4.3741$ $P = 0.38$
Islam	29 (19.3%)	27 (18.0%)	
Tribes			
Yoruba	88 (58.7%)	80 (53.3%)	$X^2 = 3.7738$ $P = 0.29$
Igbo	54 (36.0%)	58 (38.7%)	
Hausa	3 (2.0%)	1 (0.7%)	
Others	5 (3.3%)	11 (7.3%)	
Liquor Drainage			
0 – 24 hrs	127 (84.7%)		
>24 hrs	23 (15.3%)		

Table 1: Maternal Socio-demographic Characteristics

Characteristics	Study (150) Freq (%)	Control(150) Freq (%)	P-VALUE
Apgar score @ 5min			
≥ 7	139 (92.7%)	149 (99.3%)	$X^2=7.0313$ $P < 0.001$
< 7	11 (7.3%)	1 (0.7%)	
NICU admission			
. Yes	10 (6.7%)	1 (0.7%)	$X^2=6.0396$ $P = 0.025$
. No	140(93.3%)	149(99.3%)	
Neonatal Sepsis			
. Yes	7 (4.7%)	0 (0%)	$X^2 = 4.5172$ $P < 0.01$
. No	143 (95.3%)	150 (100%)	
Neonatal Death			
. No	147 (98.0%)	150(100%)	$X^2=0.2458$ $P = 0.06$
. Yes	3 (2.0%)	0 (0%)	
4) Birth weight			
Mean ± S.D	3.27 ±0.52	3.26 ±0.49	$X^2 = 4.926$ $P = 0.748$
Mode of delivery			
. SVD	114 (76.0%)	137 (91.3%)	$X^2 = 12.96$ $P < 0.001$
. CS	34 (22.6%)	12 (8.0%)	
. Vacuum	2 (1.3%)	1 (0.7%)	
6) SEX			
. Male	79 (52.7%)	82 (54.7%)	$X^2=0.8169$ $P = 0.26$
. Female	71 (47.3%)	68 (45.3%)	

Table 2: Neonatal Outcomes in both groups

V. DISCUSSION

This study assessed the maternal demography and neonatal outcome in term pregnancies complicated by prelabour rupture of membrane compared to term pregnancies with onset of labour before membrane rupture. The prevalence of prelabour rupture of membrane (PROM) in this study at 9.23% was higher than 3.3% and 8.1% from other studies[1, 11]. More nulliparous women were observed to present with PROM than the multipara. Our prevalence of 53% nullipara in the study group was lower than the 61% reported by Umber et al[3] among similar subjects. These were contrary to the findings of other workers who observed that more multiparous subjects developed PROM among their cohorts[2, 12,13].

Fifty-four percentour subjects were in the age bracket of 20-29yrswhich was higher than43% reported by Okeke et al[12] in Enugu but less than 77.6% reported by Ghandi et al in India[13]. However, previous reports indicated increasing incidence with advanced maternal age[6]. Low socioeconomic status was associated with unskilled workers (58.7%) in whomprelabour rupture of membraneoccurred in this study.Gudmundssonet al[14] observed that prelabour rupture of membranes was associated with subjects from low-income areas in their study. This may be due to unhygienic practices common in the low social economic class that maypredispose to infectionand malnutrition.

The majority of our subjects (84.5%) presented within 24 hours of the onset of PROM and this finding is consistent with those of similar studies in Benin, India, and Indonesia [6, 15, 16]. There was no report of chorioamnionitis among our subjects possibly because of the active management instituted in the study group and commencement of prophylactic antibiotic after 12 hours of ruptured membranes. Evidence supports the idea that stimulation of labour decreases the risk of chorioamnionitis without increasing the caesarean delivery rate [17]. The risk of chorioamnionitis with term PROM is less than 10% but can increase to 40% after 24 hours of PROM [18]. This illustrated the importance of appropriate management strategies for PROM at term and informed our decision to stimulate labour within one hour of presentation.

In this study, prelabour rupture of membrane was associated with a higher rate of caesarian section rate of 22.6% in the study group compared to 8% in the control (8.0%). The caesarian section rate in our study group was the same as that of Snehmay et al [19] but higher than that of other workers among similar cohorts [1, 3]. In contrast, the caesarian section rate of 8% in the control group was less than the 16.4% reported by Abisowo et al [20]. While the difference in the caesarian delivery rate was significant in this study, comparing cases of prelabour rupture of membranes that underwent both active and expectant management, active management has been found to increase maternal satisfaction without increasing caesarian section or operative vaginal birth [21]. Hence, prelabour rupture of membranes significantly increases the risk of caesarian section compared to spontaneous labour preceding it. Similarly, there was a comparable vacuum delivery rate of 1.3% and 0.7% in the study and control groups respectively.

About seven percent (7.3%) of neonates delivered by subjects in the study group had an Apgar score of < 7 compared to 0.7% in the control. The finding in the study group is comparable to the 7.3% reported by Yaqub et al [22] but lower than the 8% reported by Rajani R et al [23]. Considering the Apgar score in the control group, the figure of 0.7% was far lower than 7% by Saha P et al [24]. This led to the admission of more babies (6.7%) delivered in the study group into the neonatal intensive care unit (NICU) compared to 0.7% in the control. The NICU admission in the study group was comparable to the 8% reported by Saaqib et al [25] but far lower than 20 – 46% by other workers [24, 25, 27]. Comparatively, the 0.7% admission into NICU in the control group was also lower than the 3.6% reported by Abisowo et al [20].

In the study group, 4.7% of neonates had neonatal sepsis while none occurred in the control group. This finding in the study group was similar to 4.6% reported by Umairah et al [22] and higher than 3% by Snehmay et al [19] but lower than 7 and 10% reported by Shazia et al [26] and Jolliet et al [11] respectively. With respect to the zero neonatal sepsis in the control group, Abisowo et al [20] and Saha P et al [24] reported 0.5% and 17% respectively among similar subjects. Furthermore, 2% perinatal mortality was reported among the neonates in the study group but none in the control group. Jalli et al [28] reported 15% perinatal

mortality among similar subjects while others workers did not find any mortality [2, 3]. Concerning the control group without perinatal mortality, Abisowo et al [20] reported 1.5% perinatal mortality among similar subjects.

Our study being institutional-based with a relatively small sample size may limit the generalization of our findings. However, the prospective study design and the concept of comparing actively managed subjects with term PROM and spontaneous labour preceding ruptured membranes were significant strengths of this study.

VI. CONCLUSION

Actively managed term PROM was significantly associated with unbooked maternal status, poorer Apgar scores, higher rate of caesarian delivery, higher neonatal intensive care unit admissions, and increased perinatal morbidity and mortality compared to spontaneous labour before membrane rupture. We recommend a larger multi-regional survey to validate our findings.

• **Conflict of Interest:** None

• **Authors' contribution:** YAO, MOO, and OTA: study conception and design, acquisition of data, data analysis, and interpretation, manuscript writing, and critical revisions. FMA: study conception and design, data acquisition, analysis, and interpretation. MAS and JOC: acquisition of data, data analysis, and interpretation, manuscript writing and revisions. All authors read and approved the final manuscript.

REFERENCES

- [1.] Adamou N, Muhammad ID, Umar UA. Pre-labor rupture of membrane in Aminu Kano teaching hospital: A 2-year review. *Niger J Basic Clin Sci* 2019;16:99-102.
- [2.] Eleje G.U, Ezebialu I.U, Umeobika J.C, Eke A.C, Ezeama C.O, Okechukwu Z.C. Pre-Labour Rupture of Membranes at Term: A Review of Management in a Health Care Institution. *Afrimed Journal* 2010; 1(2): 10-14
- [3.] Umber F, Naz M, Khan R.R. Labour Induction with Oral Misoprostol In Prelabour Rupture Of Membranes At Term. *JUMDC* 2013;4(1):62-68
- [4.] Strauss JF 3rd. Extracellular matrix dynamics and fetal membrane rupture. *Reprod Sci.* 2013;20(2):140-153.
- [5.] Aboyeji A, Abdul I, Ijaiya M, Nwabuisi C, Ologe M. The bacteriology of pre-labour rupture of membranes in a Nigerian Teaching Hospital. *J Obstet Gynaecol* 2005;25:761-4.
- [6.] Osaikhuwuoman J.A, Okpere CE, Okonkwo CA et al. Plasma vitamin C levels and risk of preterm prelabour rupture of membranes. (2011) *Archives of Gynaecology and obstetrics* September 284(3): 593 – 597
- [7.] Dare MR, Middleton P, Crowther CA, Flenady VJ, Varatharaju B. Planned early birth versus expectant management for PROM at term. *Cochrane Database reviews* 2006.

- [8.] Endale T, Fentahun N, Gemada D, Hussen MA. Maternal and fetal outcomes in term premature rupture of membrane. *World J Emerg Med.* 2016;7(2):147-152
- [9.] Gupta S, Malik S. & Gupta S. Neonatal complications in women with premature rupture of membranes (PROM) at term and near term and its correlation with time lapsed since PROM to delivery. *Trop. Doct.* 50, 8–11 (2020).
- [10.] Agbara JO, Fabamwo AO, Oshodi YA. Diagnosis of Foetal Membrane Ruptures: Placental alpha-Microglobulin-1 to the rescue. *Trop J ObstetGynaecol* 2017;34:85-90.
- [11.] Vaishnav J, Vaishnav G. A Study of Feto-Maternal Outcome in Patients with Prelabour Rupture of Membranes at Term (>37 Weeks). *Medicine Science* 2012;1(2):118-24
- [12.] Okeke TC, Enwereji JO, Okoro OS, Adiri CO, Ezugwu EC, Agu PU. The incidence and management outcome of Preterm Premature Rupture of Membranes (PPROM) in a tertiary hospital in Nigeria. *Am J Clin Med Res* 2014;2:14-7.
- [13.] Gandhi M, Shah F, Panchal C. Obstetric outcomes in Premature Rupture of the Membrane (PROM). *Int J of GynecolObstet* 2012;16:234.
- [14.] Gudmundsson S, Bjorgvinsdottir L, Molin J, Gunnarsson G, Marsal K. Socioeconomic Status and Perinatal Outcome According to Residence Area in the City of Malmo. *ActaObstetGynecolScand* 1997; 76: 318-323
- [15.] Patil S, Patil V. Maternal and fetal outcome in premature rupture of membranes. *IOSR J Den Med Sci* 2014;13:56-83.
- [16.] 24. Budijaya M, Negara KS. Labor Profile with Premature Rupture of Membranes (PROM) in Sanglah hospital, Denpasar. *Int J Sci Res* 2017;6:348-53.
- [17.] Pasquier JC, Bujold E. A Systematic Review of Intentional Delivery in Women with Preterm Prelabour Rupture of Membranes. *J Matern Fetal Neonatal Med.* Jul 2007; 20(7):567-8.
- [18.] Seaward P.G, Hannah M.E, Myhr T.L, et al. International Multicentre Term Prelabour Rupture of Membranes Study: Evaluation of Predictors of Clinical Chorioamnionitis and Postpartum Fever in Patients with Prelabour Rupture of Membranes at Term. *Am J ObstetGynaecol.* 1997 Nov; 177(5):1024-9.
- [19.] Snehamay C, Nath MS, Kumar BP, Sudipta B. Premature rupture of membranes at term: immediate induction with PGE2 gel compared with delayed induction with oxytocin. *J ObstetGynecol India* 2006; 56: 224-9.
- [20.] Abisowo OY, Oyinyechi AJ, Olusegun FA, Oyedokun OY, Motunrayo AF, Abimbola OT. Feto-maternal outcome of induced versus spontaneous labour in a Nigerian Tertiary Maternity Unit. *Trop J ObstetGynaecol* 2017;34:21-7.
- [21.] Royal College of Obstetricians and Gynaecologists. Term Prelabour Rupture of Membranes (TermPROM). 2017
- [22.] Yaqub U, Mushtaq R, Mushtaq M. Obstetric and Perinatal Outcome in Induction of Labor Compared with Expectant Management for Prelabour Rupture of the Membranes. *Pak Armed Forces Med J* 2015; 65(2): 179-83
- [23.] Rawat R, Divedi P, Debbarma S, Vishwakarma S, Mittal N. A comparative study between active and expectant management of premature rupture of membranes at term on fetomaternal and perinatal outcome in rural population. *Int J ReprodContraceptObstetGynecol* 2018;7:2393-8
- [24.] Saha, S. P., et al. Comparative Study of Obstetric and Neonatal Outcome Between Spontaneous and Induced Labor in Gravid Women after 41 Completed Weeks of Gestation. (2015) *J Gynecol Neonatal Biol* 1(1): 9-13.
- [25.] Saaqib S, Mahmood R, Maternal and fetal outcome of prelabour rupture of membranes at term (PROM) – trial of 24 hours of expectant management. *Ann King Edward Med Coll Mar* 2007; 13:99-100.
- [26.] Javed S, Naurin R, Sultana B, Majeed T, Mahmood Z. Fetomaternal Outcome in Expectant Management of Prom at Term. *PJMHS* 2017;11(4):1274-6
- [27.] Javaid MK, Hassan S, Tahir T. Management of Prelabour rupture of the membranes at term: Induction of labour compared with expectant. *Professional Med J* 2008;15:216-9.
- [28.] Padmaja J, Swarupa K. Maternal and Perinatal Outcome in Premature Rupture of Membranes at Term Pregnancy. *IAIM*, 2018; 5(4): 87-91.