Maternal and Neonatal Outcomes of Expectantly Managed Pregnancies of Healthy Cases with Previable Rupture of Membranes at Qena University Hospital

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Abstract

Background : Early premature rupture of membranes (PPROM) before foetal viability complicates obstetric treatment, putting women at risk of infection, haemorrhage, and psychological anguish and newborns at danger of respiratory distress Gestational age, cervical dilatation, nulliparity, foetal development difficulties, oligohydramnios, twin gestation, and chorioamnionitis impact PPROM delay post-viability.

Aim: To analyze maternal and neonatal outcomes in PPROM cases between 20-28 weeks of pregnancy to identify potential outcome predictors.

Methods : Qena University Hospital's retrospective observational cohort research (June 2020–June 2023) comprised singleton PPROM pregnancies between 20–28 weeks. Active labour, chorioamnionitis, foetal abnormalities, recent iatrogenic ROM, multiple gestations, and immediate delivery are excluded. Maternal demographics, obstetric history, treatments (antibiotics, glucocorticoids, magnesium sulphate), and neonatal outcomes (birth weight, Apgar scores, NICU admissions, pulmonary issues, intraventricular haemorrhage, periventricular leukomalacia, necrotizing enterocolitis, and sepsis.

Results: Of the participants (mean age 27.39 years, BMI 25.07 kg/m²), 39.02% were normal weight, 34.15% overweight, and 18.29% obese Diabetes or hypertension was present in 7.32%, PROM in 24.39%, and premature labour in 30.49%. The mean ROM gestational age was 24.93 weeks, with birth in 30.11 weeks. Caesarean delivery 48.78%, vaginal 51.22%. Non-viable pregnancies had earlier ROM and delivery ages, higher Caesarean rates, and more chorioamnionitis and maternal sepsis. Neonatal survivors had higher Apgar scores, birth weights, and pulmonary hypoplasia and sepsis rates than non-survivors.

Conclusion: Early premature deliveries make PPROM management difficult. Variations in medical procedures need customised care. NICU-admitted newborns have poor neonatal outcomes, requiring tailored care and outcomes initiatives.

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Introduction

Early premature rupture of membranes (PPROM) before foetal viability complicates obstetric care. Expectant therapy of spontaneous amniotic membrane rupture before 24 weeks gestation must be carefully considered. Obstetricians must understand maternal and newborn outcomes of expectant care for previable rupture of membranes to make educated decisions (1).

Expectant management challenges the balance between safe pregnancy progression and maternal and newborn problems. Risks for mothers include intrauterine infections such chorioamnionitis, hemorrhagic complications including placental abruption, and the psychological toll of neonatal health uncertainty. Preterm delivery, whether spontaneous or induced, complicates maternal health (2).

Neonatal outcomes in previable membrane rupture pregnancies are closely connected to extreme preterm. These babies are at risk for respiratory distress syndrome, intraventricular haemorrhage, and bronchopulmonary dysplasia. Long-term amniotic exposure increases infection risk and pulmonary hypoplasia risk, especially when membrane rupture occurs early in gestation. Understanding these outcomes is essential for providing thorough and compassionate care to mothers and their infants (3).

Current study examines factors affecting preterm premature rupture of membranes (PROM) post viability (>24 weeks) latency. Lower gestational age, higher cervical dilatation, nulliparity, foetal development limitation, and oligohydramnios are associated with shorter latency in the 24-34 week period. Latency is also shortened by twin gestation and symptomatic chorioamnionitis. However, second-trimester PROM variables are still poorly understood (4).

This study aimed to analyze maternal and neonatal outcomes in patients with previable rupture of membranes (PPROM) between 20_28 weeks of pregnancy to identify potential outcome predictors.

Patients and Methods

The project's technical design involves a retrospective observational cohort study carried out at the Obstetrics and Gynaecology Department at Qena University Hospital between June 2020 and June 2023 . This study was a proceeding for our previous study of (5). The study centered on patients who met certain criteria. The inclusion criteria consisted of patients who were treated at Qena Woman Hospital, had singleton pregnancies, experienced previable rupture of membranes (ROM), and had gestational ages between 20 and 28 weeks. The exclusion criteria for this study were as follows: the presence of active labour before or at the onset of previable rupture of membranes (ROM), signs of active chorioamnionitis upon admission, visible foetal structural anomalies detected during ultrasound examination, iatrogenic rupture of membranes within 2 weeks of amniocentesis or chorionic villus sampling, rupture of membranes occurring after viability but before the onset of labour, a latency period of less than 24 hours, and the presence of multiple foetal gestations.

The study's operational design entailed a comprehensive examination of medical records to identify pregnancies that met the criteria for eligibility. More precisely, we included women who had a single pregnancy and experienced premature rupture of membranes (PROM) during the second trimester, specifically between 20 and 28 weeks of pregnancy. To be included, these women had to have a latency period of at least 24 hours. Various diagnostic methods were used to determine if there was a rupture of membranes (ROM). These methods included visually inspecting amniotic fluid

passing from the cervical canal and pooling in the vagina using a sterile speculum examination, conducting a basic pH (positive nitrazine) test on vaginal fluid, examining dried vaginal fluid under a microscope to look for arborization (ferning), or measuring the amniotic fluid index (AFI) which should be less than 4 cm. Additionally, the patient's reported history of significant loss of vaginal fluid before 28 weeks of gestational age was taken into consideration. To maintain the quality of the study sample, certain criteria were used to exclude women. Those who showed clinical signs of chorioamnionitis upon arrival, experienced labour within 24 hours of membrane rupture, had a major foetal anomaly, or had PROM within 2 weeks of chorionic villus sampling/ amniocentesis were excluded. In order to maintain the consistency and accuracy of the study results, women who chose to have immediate delivery upon diagnosis of premature rupture of membranes (PROM) were also not included in the analysis.

The study comprehensively gathered data from the medical records of patients, including multiple aspects of maternal and obstetric care. The documented therapies for preterm premature rupture of membranes (PPROM) upon readmission were carefully recorded, which included the administration of latency antibiotics, a regimen of glucocorticoids to promote foetal lung maturity, and magnesium sulphate for foetal neuroprotection. During the time from when the patient was readmitted to when she gave birth, continuous inpatient observation was conducted to ensure thorough monitoring of the mother's health and well-being.

The maternal data collected from the records consisted of demographic variables, including age and body mass index (BMI). In addition, the researchers recorded the gravidity, which refers to the overall number of pregnancies regardless of the outcome, and the parity, which indicates the number of viable children born after 20 weeks of gestation. Additionally, any prior occurrences of premature deliveries were documented. Obstetric data yielded vital information about the timing of events, such as the gestational age when the membranes ruptured and when delivery occurred. The latency interval, which refers to the duration between the rupture of membranes and birth, was meticulously documented. The documentation was rigorous in recording information about the administration of antibiotics before delivery, the method of delivery (vaginal or caesarean section), and any difficulties that occurred throughout the pregnancy, such as chorioamnionitis, maternal sepsis, and cord prolapse. Furthermore, the duration of hospitalisation and utilisation of resources were assessed by calculating the maternal length of stay in the hospital, which includes initial observation, readmission, delivery, and postpartum inpatient care.

The study systematically gathered neonatal data, including multiple crucial elements of newborn health and outcomes. This involved recording cases of intrauterine foetal demise, which is the term used to describe the death of a foetus while still in the mother's womb after the 20th week of pregnancy. In addition, the neonatal birth weight, which was measured with a digital scale to the nearest 0.01 kg, offered important information about the growth and development path of the newborns. The Apgar ratings, measured at 1 and 5 minutes after birth, were meticulously documented. The values ranged from 0 to 10, with higher scores indicating superior overall health and adjustment to life outside the womb (6).

	Sign	Score		
		2	1	0
A	Appearance (skin colour)	Normal over entire body	Normal exept extremities	Cyanotic or pale all over
P	Pulse (heart rate)	> 100 bpm	< 100 bpm	Absent
G	Grimace response (refle xes)	Sneezes coughs, pulls away	Grimace	No response
A	Activity (muscle tons)	Active	Arms and legs flexed	Absent
R	Respiration (breathing rate and effort)	Good, crying	Slow, irregular	Absent

Furthermore, the study highlighted the necessity of being admitted to the neonatal intensive care unit (NICU), which indicates the seriousness of neonatal problems and the extent of medical attention needed. The duration of specialised medical attention was recorded, reflecting the length of stay in the NICU. The study thoroughly evaluated neonatal survival outcomes, which included three parameters: admission to the Neonatal Intensive Care Unit (NICU) with survival until discharge, admission to the NICU followed by neonatal death before discharge, or neonatal death without NICU admission.

The study carefully recorded neonatal diagnoses upon discharge from the neonatal intensive care unit (NICU), providing insight into the many health problems experienced by neonates. One of the diagnoses found was pulmonary hypoplasia, which refers to the condition of the lungs being underdeveloped or not fully grown. In addition, bronchopulmonary dysplasia was observed, which is characterised by inflammation and scarring in the lungs. This condition is commonly linked to the use of mechanical ventilation and oxygen therapy. Respiratory distress was observed, characterised by fast breathing, grunting, flaring of nostrils, and retractions of the chest wall.

In addition, intraventricular haemorrhage (IVH) was categorised into different categories, with categories III and IV being defined as severe IVH. Grade I refers to bleeding that is confined to the germinal matrix, whereas Grade II indicates intraventricular haemorrhage without enlargement of the ventricles. Grade III indicated intraventricular haemorrhage (IVH) with ventricular dilatation that filled over 50% of the ventricle, whereas Grade IV indicated IVH with bleeding within the brain tissue (7). Another diagnostic that was established is periventricular leukomalacia, which is characterised by brain damage in the white matter and the necrosis of white matter around the lateral ventricles.

Furthermore, instances of necrotizing enterocolitis, a grave illness characterised by inflammation and tissue death in the bowel, were documented. The evaluation of neonatal sepsis, caused by a proven bacterial infection, was thoroughly conducted using precise criteria (8). The criteria consisted of a body temperature above 38°C or below 36°C, a heart rate over 90 beats per minute, hyperventilation indicated by a respiratory rate above 20 breaths per minute or a PaCO2 below 32 mmHg, and a white blood cell count above 12,000 cells/μL or below 4,000 cells/μL. The diagnosis of each case was meticulously defined, guaranteeing precision and uniformity in evaluating the health outcomes of newborns.

Study outcomes

Primary outcome: The primary objective of this study was to evaluate the quality of care delivered to women undergoing inpatient

management with PROM compared with a recently instituted hospital protocol.

Secondary (subsidiary): A secondary objective was to investigate the maternal and neonatal outcomes of conservative management of Previable ROM at 20-28 weeks gestational ages in Qena University hospital, and to determine the impact of the protocol on hospital stay (bed occupancy rate).

Data analyzed using SPSS 25.0. Methods: Expressing data as number/percentage for qualitative variables and mean ± SD for quantitative ones. Statistical analysis included mean for central tendency and SD for dispersion. Comparison using t-test for two groups' means, checked against t-table for significance. Mann-Whitney test for non-normally distributed data, and Chi-square test for association between variables. Significance level set at $p < 0.05$, where smaller p values denote higher significance.

Results

Table (1): General data of included subjects

	Value (N = 82)
Age (Years)	27.39 ± 5.81
BMI (Kg/m^2)	25.07 ± 4.53
Underweight	7 (8.54%)
Normal	32 (39.02%)
Overweight	28 (34.15%)
Obese	15 (18.29%)
Gravidity	3.46 ± 2.3
Parity	2.2 ± 1.71
Abortion	0.93 ± 1.33
Medical History	
Anaemia	2 (2.44%)
Aphge	1 (1.22%)
Diabetes Mellitus	6 (7.32%)
Hypertension	6 (7.32%)
Renal	1 (1.22%)
Rheumatic Heart Disease	1 (1.22%)
Thalassemia	1 (1.22%)
History of previous PROM	20 (24.39%)
History of previous Preterm Labor	25 (30.49%)
WGA at rupture of membranes (Weeks)	24.93 ± 2.92
Latency period (Weeks)	5.11 ± 4.8
WGA at time of delivery (Weeks)	30.11 ± 6.17
Route of delivery	
CS	40 (48.78%)
NVD	42 (51.22%)

The participants had a mean age of 27.39 years (SD = 5.81), and the average Body Mass Index (BMI) was 25.07 kg/m^2 (SD = 4.53), with 8.54% underweight, 39.02% normal weight, 34.15% overweight, and 18.29% obese. Gravidity averaged 3.46 ± 2.3, parity was 2.2 ± 1.71, and the abortion rate was 0.93 ± 1.33. Medical history included conditions like anemia (2.44%), aphge (1.22%), diabetes mellitus (7.32%), hypertension (7.32%), renal issues (1.22%), rheumatic heart disease (1.22%), and thalassemia (1.22%). Additionally, 24.39% reported previous premature rupture of membranes (PROM), and 30.49% had a history of preterm labor. The mean weeks of gestational age at ROM were 24.93 ± 2.92, latency period in weeks was 5.11 ± 4.8, and weeks of gestational age at delivery were 30.11 ± 6.17. Delivery modes comprised 48.78% Caesarean sections (CS) and 51.22% normal vaginal deliveries (NVD).

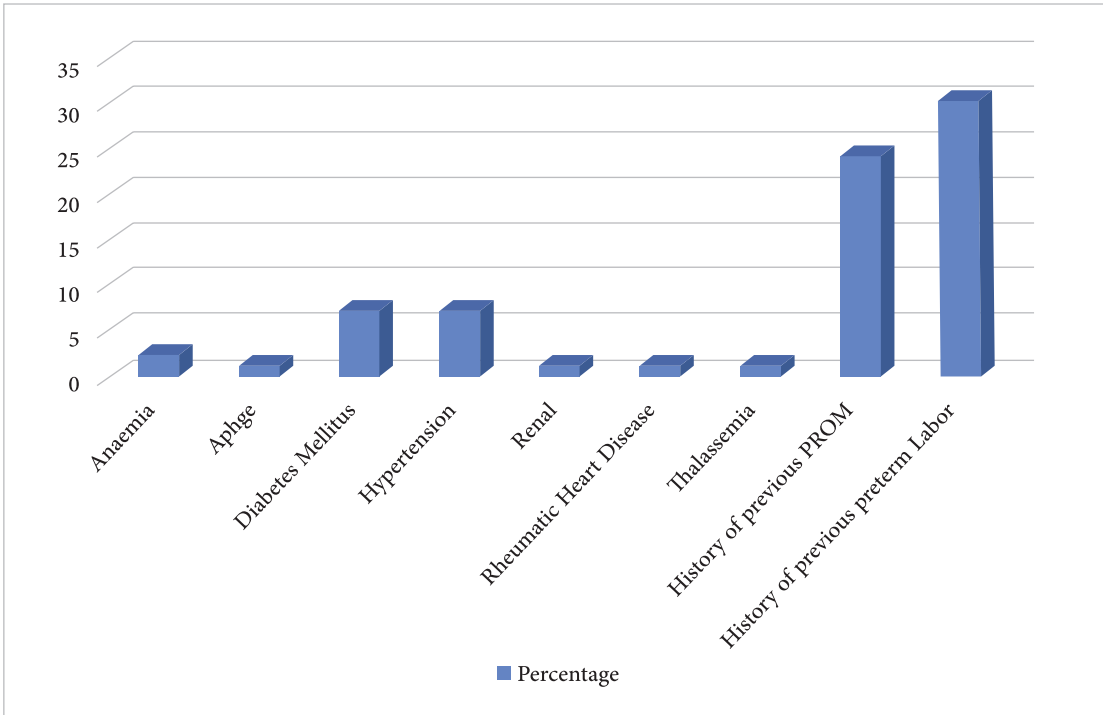

Figure (1): Medical History among included subjects

Table (2): Comparison between viable and not viable fetuses regarding maternal data

	Viable (N = 57)	Not Viable (N = 25)	P. Value
Age (Years)	27.72 ± 5.98	26.64 ± 5.33	0.4447
Gravidity	3.47 ± 2.16	3.44 ± 2.59	0.9521
Parity	2.16 ± 1.59	2.29 ± 1.96	0.781
Abortion	0.88 ± 1.22	1.05 ± 1.57	0.6286
Medical History			
Anaemia	2 (3.51%)	0 (0%)	0.3491
Aphge	1 (1.75%)	0 (0%)	0.5112
Diabetes Mellitus	5 (8.77%)	1 (4%)	0.4512
Hypertension	5 (8.77%)	1 (4%)	0.4512
Renal	0 (0%)	1 (4%)	0.1319

Rheumatic Heart Disease	1 (1.75%)	0 (0%)	0.5112
Thalassemia	1 (1.75%)	0 (0%)	0.5112
History of previous PROM	12 (21.05%)	8 (32%)	0.2937
History of previous Preterm Labor	15 (26.32%)	10 (40%)	0.2202
WGA at rupture of membranes (Weeks)	26.21 ± 2.19	22.01 ± 2.17	<0.0001*
Latency period (Weeks)	6.68 ± 4.55	1.51 ± 3.14	<0.0001*
WGA at time of delivery (Weeks)	33.2 ± 4.47	23.07 ± 2.85	<0.0001*
Route of delivery			
CS (Caesarean Section)	38 (66.67%)	2 (8%)	<0.0001*
NVD (Normal Vaginal Delivery)	19 (33.33%)	23 (92%)	
Maternal complications			
Chorioamnionitis	2 (3.51%)	10 (40%)	<0.0001*
Maternal sepsis	1 (1.75%)	3 (12%)	0.0481*
Cord prolapse	1 (1.75%)	5 (20%)	0.0031*
Antibiotic			
Type (Ultracellin or Ceftriaxone)	57 (100%)	17 (68%)	<0.0001*
Dose (1.5 g/12 h… 1g/24h)	57 (100%)	17 (68%)	<0.0001*
Route (I.V.)	57 (100%)	17 (68%)	<0.0001*
Glucocorticoids			
Dose (6mg/8 h)	42 (73.68%)	3 (12%)	<0.0001*
Type (Dexamethasone)	42 (73.68%)	3 (12%)	<0.0001*
Magnesium sulfate			
Loading dose (6gm/15-20 min)	9 (15.79%)	1 (4%)	0.1303
Maintenance dose (1gm/hour/24h)	9 (15.79%)	1 (4%)	0.1303

Non-significant changes were found in maternal age (27.72 ± 5.98 vs. 26.64 ± 5.33, p = 0.4447), gravidity (3.47 ± 2.16 vs. 3.44 ± 2.59, p = 0.9521), parity (2.16 ± 1.59 vs. 2.29 ± 1.96, p = 0.781), and abortion rates (0.88 ± 1.22 vs. 1.05 ± 1.57, Medical history showed few differences, including anemia (3.51% vs. 0%, p = 0.3491), aphge (1.75% vs. 0%, p = 0.5112), diabetes mellitus (8.77% vs. 4%, p = 0.4512), hypertension (8.77% vs. 4%), renal issues (0% vs. 4%, p = 0.1319), rheumatic heart disease (1.75% vs. 0%, p = 0.5112), and thalassemia (1.75% vs. Non-viable instances showed substantial decreases in WGA at ROM (26.21 ± 2.19 vs. 22.01 ± 2.17, p < 0.0001*), latency time (6.68 ± 4.55 vs. 1.51 ± 3.14), and WGA at delivery (33.2 ± 4.47 vs. 23.07 ± 2.85, p < 0.0001*). Significant differences were observed in Caesarean section (66.67% vs. 8%, p < 0.0001*) and normal vaginal delivery (33.33% vs. 92%) rates. Non-viable patients showed significant increases in chorioamnionitis (3.51% vs. 40%, p < 0.0001*), maternal sepsis (1.75% vs. 12%, p = 0.0481*), and cord prolapse (1.75% vs. 20%, p = 0.0031*). Significant increases in antibiotic and glucocorticoid use were observed in viable instances (100% vs. 68%, p < 0.0001*), but magnesium sulfate administration revealed no significant difference (15.79% vs. 4%, p = 0.1303).

Table (3): Comparison between viable and not viable fetuses regarding maternal Amniotic Fluid evaluation at time of admission by US

	Viable (N = 57)	Not Viable (N = 25)	P. Value
Average Amniotic Fluid	16 (28.07%)	1 (4%)	0.013*
Mild Oligohydramnios	29 (50.88%)	3 (12%)	0.0007*
Severe oligohydramnios	2 (3.51%)	3 (12%)	0.1425
Anhydramnios	9 (15.79%)	18 (72%)	<0.0001*
Polyhydramnios	1 (1.75%)	0 (0%)	0.5112
Placenta Previa	2 (3.51%)	0 (0%)	0.3491
Placental Separation	1 (1.75%)	1 (4%)	0.5497
Polycystic Kidneys	1 (1.75%)	0 (0%)	0.5112
Fibroid	1 (1.75%)	0 (0%)	0.5112
IUGR	1 (1.75%)	0 (0%)	0.5112
Dead Fetus	0 (0%)	1 (4%)	0.1319

Statistically significant distinctions were observed in average amniotic fluid volume (28.07% vs. 4%, p = 0.013*), mild oligohydramnios prevalence (50.88% vs. 12%, p = 0.0007*), anhydramnios incidence (15.79% vs. 72%, p < 0.0001*), and various other parameters. Minimal disparities were noted in severe oligohydramnios, polyhydramnios, placenta previa, placental separation, polycystic kidneys, fibroid, intrauterine growth restriction (IUGR), and the occurrence of a dead fetus. From all viable fetuses, 35 were admitted to the NICU and 22 weren't admitted to the NICU.

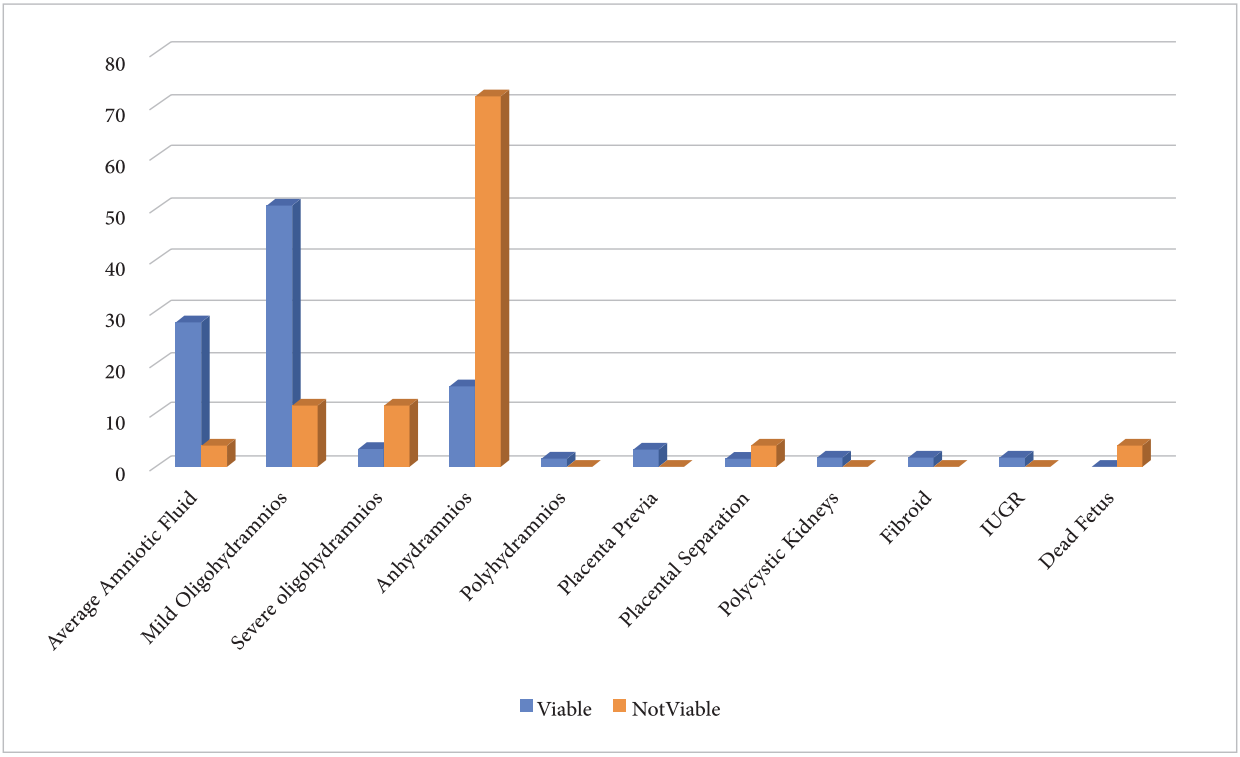

Figure (2): Comparison between viable and not viable fetuses regarding maternal Amniotic Fluid evaluation at time of admission by US

Table (4): Comparison between NICU survival neonates and those who died at NICU regarding maternal data

	NICU Survival (N = 20)	Death at NICU (N = 15)	P. Value
Age (Years)	27.9 ± 6.37	28.27 ± 4.84	0.8576
Gravidity	3.3 ± 2.03	3.93 ± 1.69	0.3479
Parity	2.12 ± 1.28	2 ± 1.31	0.809
Abortion	0.76 ± 0.88	1.29 ± 1.67	0.2895
Medical History			
Anaemia	0 (0%)	1 (6.67%)	0.2541
Aphge	1 (5%)	0 (0%)	0.3945
Diabetes Mellitus	1 (5%)	1 (6.67%)	0.8394
Hypertension	2 (10%)	1 (6.67%)	0.7367
Renal	0 (0%)	0 (0%)	
Rheumatic Heart Disease	0 (0%)	1 (6.67%)	0.2541
Thalassemia	0 (0%)	0 (0%)	
History of previous PROM	2 (10%)	7 (46.67%)	0.0131*
History of previous Preterm Labor	9 (45%)	3 (20%)	0.1305
WGA at rupture of membranes (Weeks)	26.64 ± 1.83	25.97 ± 2.01	0.3239
Latency period (Weeks)	6.74 ± 3.23	2.63 ± 3.21	0.001*
WGA at time of delivery (Weeks)	33.65 ± 2.8	28.69 ± 3.43	0.0001*
CS	16 (80%)	9 (60%)	0.206
NVD	4 (20%)	6 (40%)	
Maternal complications			
Chorioamnionitis	0 (0%)	2 (13.33%)	0.086
Maternal sepsis	0 (0%)	1 (6.67%)	0.2541
Cord prolapse	0 (0%)	1 (6.67%)	0.2541
Antibiotic			
Type (Ultracellin or Ceftriaxone)	20 (100%)	15 (100%)	-
Dose (1.5 g/12 h… 1g/24h)	20 (100%)	15 (100%)	-
Route (I.V.)	20 (100%)	15 (100%)	-
Glucocorticoids			
Dose (6mg/8h)	17 (85%)	10 (66.67%)	0.2125
Type (Dexamethasone)	17 (85%)	10 (66.67%)	0.2125
Magnesium sulfate			
Loading dose (6gm/15-20 min)	5 (25%)	2 (13.33%)	0.4081
Maintenance dose (1gm/hour/24h)	5 (25%)	2 (13.33%)	0.4081

In the comparison between neonates who survived in the Neonatal Intensive Care Unit (NICU) and those who died, maternal general data showed no significant differences, including maternal age (27.9 ± 6.37 vs. 28.27 ± 4.84, p = 0.8576), gravidity (3.3 ± 2.03 vs. 3.93 ± 1.69, p = 0.3479), parity (2.12 ± 1.28 vs. 2 ± 1.31, p = 0.809), and abortion rates (0.76 ± 0.88 vs. 1.29 ± 1.67, p = 0.2895). Similarly, medical history parameters showed no significant differences. However, focusing on maternal gestational age (GA) metrics at rupture of membranes (ROM) and delivery, neonates who survived in the NICU demonstrated a significant increase in the latency period (6.74 ± 3.23 vs. 2.63 ± 3.21, p = 0.001*) and weeks of gestational age (WGA) at delivery (33.65 ± 2.8 vs. 28.69 ± 3.43, p = 0.0001*). Caesarean section rates (80% vs. 60%) and normal vaginal delivery rates (20% vs. 40%) did not exhibit significant differences. Maternal complications, including chorioamnionitis, maternal sepsis, and cord prolapse, also displayed no significant differences between the two groups. Examination of maternal medications during pregnancy revealed no significant differences in antibiotic administration (100% vs. 100%) and glucocorticoid use (85% vs. 66.67%).

Table (5): Comparison between NICU survival neonates and those who died at NICU regarding maternal Amniotic Fluid evaluation at time of hospital admission by US

	NICU Survival (N = 20)	Death at NICU (N = 15)	P. Value
Average Amniotic Fluid	2 (10%)	0 (0%)	0.2188
Mild Oligohydramnios	13 (65%)	9 (60%)	0.7702
Severe oligohydramnios	1 (5%)	1 (6.67%)	0.8394
Anhydramnios	4 (20%)	4 (26.67%)	0.6537
Polyhydramnios	0 (0%)	1 (6.67%)	0.2541
Placenta Previa	1 (5%)	1 (6.67%)	0.8394
Placental Separation	0 (0%)	1 (6.67%)	0.2541
Polycystic Kidneys	0 (0%)	1 (6.67%)	0.2541
Fibroid	1 (5%)	0 (0%)	0.3945
IUGR	0 (0%)	1 (6.67%)	0.2541

Assessing amniotic fluid evaluation at hospital admission via ultrasound, NICU survival neonates exhibited no significant differences compared to those who died. No notable disparities were observed in average amniotic fluid volume, oligohydramnios, severe oligohydramnios, anhydramnios, polyhydramnios, placenta previa, placental separation, polycystic kidneys, fibroid, and intrauterine growth restriction (IUGR).

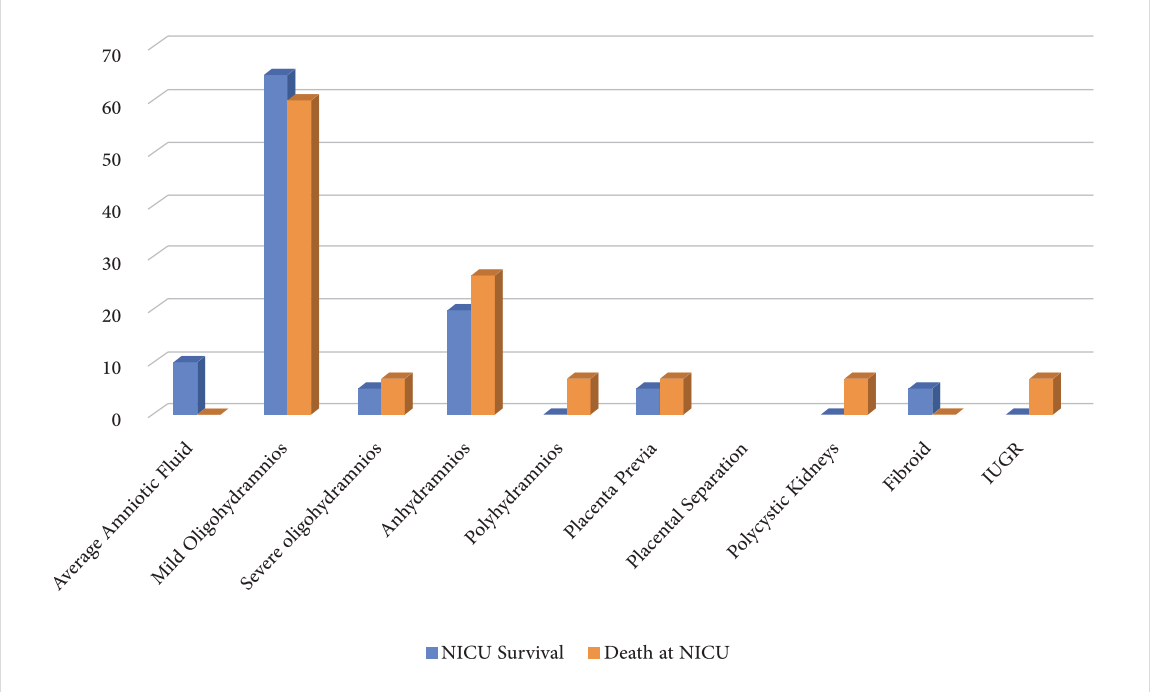

Figure (3): Comparison between NICU survival neonates and those who died at NICU regarding maternal Amniotic Fluid evaluation at time of hospital admission by US

Table (6): Comparison between NICU survival neonates and those who died at NICU regarding fetal outcomes

	NICU Survival (N = 20)	Death at NICU (N = 15)	P. Value
Neonatal outcomes			
Apgar score			
1 minute	6.4 ± 1.2	4.4 ± 1.31	0.0001*
5 minutes	7.05 ± 1.53	4.67 ± 1.62	0.0001*
Neonatal birth weight	2.52 ± 0.36	1.69 ± 0.63	<0.0001*
Length of stay (days)	9.81 ± 6.61	6.15 ± 4.7	0.1038
Neonatal complications			
Pulmonary hypoplasia	11 (55%)	14 (93.33%)	0.012*
Respiratory Distress Syndrome	8 (40%)	10 (66.67%)	0.1254
Neonatal sepsis	4 (20%)	9 (60%)	0.0145*
Intraventricular hemorrhage	0 (0%)	1 (6.67%)	0.2541
Pneumonia	4 (20%)	3 (20%)	0.99

In terms of neonatal outcomes, significant differences were observed in Apgar scores at 1 minute (6.4 ± 1.2 vs. 4.4 ± 1.31, p = 0.0001*) and 5 minutes (7.05 ± 1.53 vs. 4.67 ± 1.62, p = 0.0001*), with the survival group showing higher scores, while neonatal birth weight exhibited a significant decrease (2.52 ± 0.36 vs. 1.69 ± 0.63, p < 0.0001*). All neonates were admitted to the NICU in both groups, with no significant difference in length of stay (9.81 ± 6.61 vs. 6.15 ± 4.7, p = 0.1038). Regarding neonatal complications, there was a significant increase in the incidence of pulmonary hypoplasia among those who died compared to the survival group (55% vs. 93.33%, p = 0.012*). Respiratory distress syndrome showed a non-significant increase in the

death group (40% vs. 66.67%, p = 0.1254), while neonatal sepsis exhibited a significant increase in the death group (20% vs. 60%, p = 0.0145*). Intraventricular hemorrhage and pneumonia showed no significant differences between the two groups (0% vs. 6.67%, p = 0.2541 and 20% vs. 20%, p = 0.99, respectively).

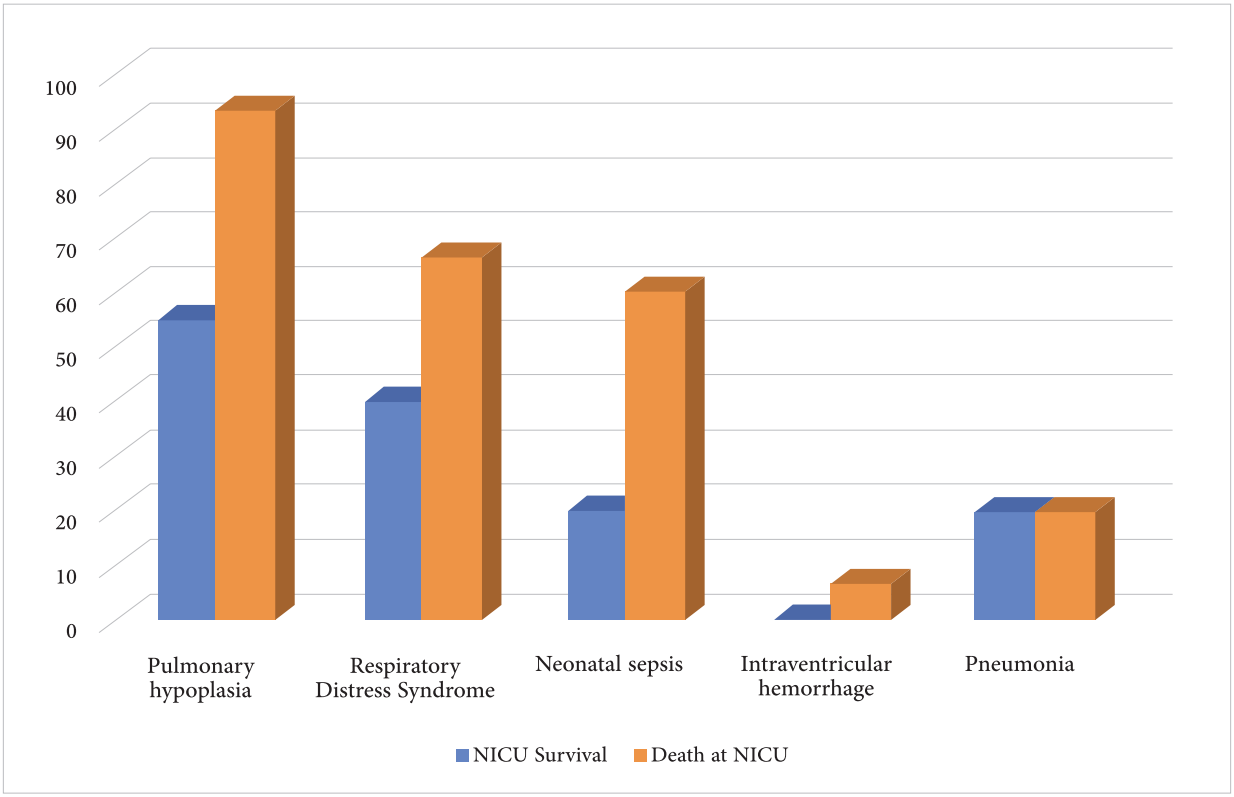

Figure (4): Comparison between NICU survival neonates and those who died at NICU regarding Neonatal complications.

Discussion

Our study reported a mean mother age of 27.39, gravidity of 3.46, parity of 2.2, and abortion rate of 0.93. Preterm labor (30.49%) and early rupture of membranes (24.39%) are notable. Mother overall data was the same for viable and non-viable fetuses. We found no significant differences in maternal age (28 vs. 30 years), gravida (2 vs. 2), or parity (1 vs. 1) between pre-viable and viable PPROM patients, supporting (9).

According to (10), there were no significant differences in maternal age, primigravida status, preterm labor history, or PPROM history between early and late PPROM groups (p=0.090, p=0.487, p=0.542, p=0.523, These factors were similar in early and late PPROM groups.

PPROM gestational age considerations illuminated our study. The mean gestational age at rupture of membranes (ROM) was 24.93 weeks, with a 5.11-week delay and 30.11-week delivery. Nonviable fetuses had considerably lower gestational age at ROM, latency length, and delivery.

In agreement with our findings, (11) found a mean gestational age of 20.45 ± 2.9 weeks and a mean latency duration of 44.7 ± 34.8 days at PPROM Timing is crucial, as (12) discovered significant differences in gestational age at PPROM between early and late groups.

(13) discovered significant differences in gestational age at PPROM between expectant management and termination of pregnancy groups, underlining the necessity for age-specific therapy.

Our study used a comprehensive approach to treat preterm premature membrane rupture. Most (90.24%) received Ultracellin or Ceftriaxone to avoid infections. Clinical guidelines indicate complex therapy, so Dexamethasone (54.88%) and magnesium sulfate (12.2%) were given during fetal lung maturation in viable instances.

Fetal viability affects antibiotic and glucocorticoid therapy. Increasing antibiotic use (100% vs. 68%, $p < 0.0001$*) in viable patients emphasizes the importance of infection prevention for better outcomes. Variations in glucocorticoid use (73.68% vs. 12%, $p < 0.0001$*) emphasize the necessity for viability-based therapy.

(14) advised proactive antibiotic treatment to minimize intrauterine infections. For better maternal outcomes, (15) recommended diligent antibiotic monitoring.

Our study used 54.88% glucocorticoids, compared to 37.8% in (16). Different managerial practices are suggested.

Mild oligohydramnios (39.02%) and anhydramnios (32.93%) dominated amniotic fluid. Viable and non-viable pregnancies differed in amniotic fluid volume (28.07% vs. 4%, $p = 0.013$*), mild oligohydramnios prevalence (50.88% vs. 12%, $p = 0.0007$*), and anhydramnios incidence (15.79% vs. 72%, p

(17) found 88.2% perinatal mortality from anhydramnios. After PPROM, (18) linked oligohydramnios to lower Apgar scores and longer NICU stays. Another study linked oligohydramnios severity to neonatal survival.

(9) discovered no link between amniotic fluid volume and oligohydramnios severity and neonatal outcomes. Study gestational age ranges may explain this variation. Our study focuses on previable ROM (20-28 weeks), but ÖZEL et al.'s study includes PPROM (12-33 weeks), potentially altering results.

51.22% were normal vaginal deliveries and 48.78% Caesarean sections. The study demonstrated that viability status impacts delivery outcomes, with viable cases having a higher NVD rate (33.33% vs. 92%, $p < 0.0001$*) and non-viable cases having a higher CS rate (66.67% vs. 8%, $p < 0.000$*

Our CS rate (48.78%) exceeds (17) 27.6% in singleton PPROM pregnancies before 24 weeks. (9) discovered significant CS rate differences between pre-viable and viable PPROM groups (27.5% vs. 65.2%, $p < 0.001$).

In expectantly managed preterm premature rupture of membranes (pPPROM), (2) identified a 21.1% CS rate and delivery style impacting newborn mortality. Our maternal issues included chorioamnionitis (14.63%), maternal sepsis (4.88%), and cord prolapse (7.32%), unlike Mung-Yuen and Tsz-Kin (2017) and Linehan and Walsh (2020

(19) discovered 64.7% medical terminations, 19.6% spontaneous abortions, and 29.4% intraamniotic infections. (12) report reduced severe maternal morbidity and mortality. Prenatal prognosis is challenging despite therapy advancements.

Newborns had a 69.51% viability rate, with Apgar scores of 6.6 ± 2.28 at 1 minute and 7.04 ± 2.31 at 5 minutes. NICU admissions at 61.4% and fetal survival at 73.68%. Chorioamnionitis, sepsis, and nonviable cord prolapse were maternal problems.

Subgroup analysis of viable NICU admissions found variations in our study. Out of 35 NICU-admitted neonates, 57.14% (20) survived and 42.86% (15) perished. NICU-admitted neonates showed lower latency period, WGA, mild oligohydramnios, and lower amniotic fluid volume. NICU survivors also had longer latency and gestational ages. Our study found no significant differences in maternal medication habits, delivery procedures, or Apgar ratings, but deceased newborns had higher rates of pulmonary hypoplasia and neonatal infection.

(14) documented newborn consequences include pulmonary hypoplasia (29.5%), congenital infection (56.8%), and intraventricular hemorrhage (25%). (20) noted that earlier gestational age at PPROM negatively affected newborn prognosis. (19) observed 28.6% infant mortality due to pulmonary hypoplasia and diverse morbidity. For surviving infants, (21) reported significant incidences of respiratory distress syndrome, neonatal sepsis, bronchopulmonary dysplasia, and intraventricular hemorrhage

Neonatal survival rates vary despite advancements. (15) observed NICU-admitted newborns had a 95% fatality rate, while (22) found 18.7% and 42.8% survival rates for distinct gestational age groups. (17) found a 73.3% perinatal mortality rate, with most survivors having good neurodevelopment but respiratory issues.

Conclusion

In conclusion, our study on expectantly managed pregnancies with previable rupture of membranes reveals challenges in early preterm births. Variations in medical interventions highlight the need for tailored care. Adverse neonatal outcomes in NICU-admitted neonates emphasize the necessity for targeted strategies in this vulnerable population, aiding clinicians and researchers in enhancing care and outcomes.

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