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Prevalence Of Premature Rupture Of Membrane And Associated Factors Among Maternal In El-Beyda Medical Center-Libya

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Abstract:

Background: Premature breakdown of membranes is an event that occurs during pregnancy when the sac containing the developing baby (fetus) bursts or develops a hole prior to the start of labor. occurs in 3% of pregnancies and is the cause of about one-third of preterm deliveries. objective of study: To evaluate the risk factors and the pooled prevalence of PROM among Maternal in El-Beyda Medical Center, in addition, to determine the relationship between PROM and its risk factors. Method: a cross-sectional, descriptive study was conducted. The study was conducted at Al-Beyda Medical Center from April 10 to May 3, 2024.The sample is 118. Data were collected using a structured questionnaire with a face-to-face interview. Result: The majority of participants belonged age group(26-35), and followed by the group that between in(36-45) at 36.4% and 35.6% respectively with mean± SD32.84±8.152. The majority of participants(70.3%) have a graduate degree, more than the half of participant's suffered from UTI(urinary tract infection at range of (65.30%). Approximately, (40.70%) suffered from anemia, and more than the half (52.50%)of them had abnormal vaginal discharge, less than quarter(22%) of participants were exposed to an accident fall during pregnancy, (16.90%) of them experience with lifting heavy objects.

In conclusion: In conclusion, the current study, found that the malformations, and infections of the urinary tract statistically significant with premature rupture of membrane at P-value < 0.05. it is important to encourage the use of ANC visits, early detection and treatment of urinary and reproductive tract infections

Keywords :Preterm Birth (PTB); Premature Rupture of Membranes (PROM); PPROM; TPROM; Risk Factors; Maternal Health; Urinary Tract Infection (UTI); Normal vaginal delivery (NVD) and Cesarean Section(C/S).

Introduction

Preterm birth (PTB) is one of the most important problems in medicine today, with an alarming frequency and economic impact(1). The World Health Organization (WHO) defines preterm birth (PTB) as occurring after 24 weeks and before 37 weeks' gestational age, or to 259 days from the onset of a woman's latest menstrual cycle (2).

When the chorioamnionitis membrane ruptures and a flood of fluid enters the birth canal before labor begins, this condition is known as premature rupture of the membrane (PROM). According to gestational age, divide prom into two categories in countless books. Premature rupture of membrane (PROM), which occurs before 37 weeks' gestational age, is called PPROM, while premature rupture of membrane (PROM), which occurs after 37 weeks' gestational age, is called TPROM(3).

Premature breakdown of membranes is an event that occurs during pregnancy when the sac containing the developing baby (fetus) bursts or develops a hole prior to the start of labor. occurs in 3% of pregnancies and is the cause of about one-third of preterm deliveries. Significant prenatal morbidity, such as placental abruption, neonatal infections, respiratory distress syndrome, and umbilical cord prolapses, can result from it. Appropriate assessment and management are important to improve neonatal outcomes.. Preterm, the prevalence of PROM varies in different countries and populations, and many factors affect its occurrence(4). Globally, preterm birth is among the three leading causes of neonatal mortality (5),and premature rupture of membranes contributes to more than 40% of preterm births(6) and is associated to 18 to 20% of premature births. and 21% of the causes, respectively, 4% of perinatal mortality and morbidity(7).

PROM affects approximately 1 in 10 women worldwide and may be complicated by prematurity, neonatal infection, or umbilical cord prolapse. According to earlier research, have shown that the earlier the PROM occurs and the gestation of the pregnancy, the greater the risk of these complications(8).

Early membrane rupture causes fetal distress (i.e., for reasons of placental abruption or compression of the umbilical cord), sepsis, and intraventricular hemorrhage; it raises the possibility of a cesarean delivery because the fetal heart rate is not reassuring(9) & (7). Hence, the aim of study, to evaluate the risk factors and the pooled prevalence of PROM among Maternal in El-Beyda Medical Center, in addition, to determine the relationship between PROM and its risk factors.

Methodology a cross-sectional, descriptive study was conducted. The study was conducted at Al-Beyda Medical Center. All mothers who attended the gynecology clinics, labor room, and postoperative care unit at El-Beyda Medical Center during the data collection period. A convenience sample of all mothers who attended the center and met the study criteria in Al-Beyda Medical Center from April 10 to May 3, 2024.The sample is 118. All mothers who had attended the gynecologists`s clinics, labor room, and post-operative care unit at El-Beyda Medical Center were included; in addition, the women agreed to participate, and were able to answer questions, were enrolled in this study**.** Data were collected using a structured questionnaire with a face-to-face interview. The questioners were adopted from previous studies(10, 11). Modifications to suit the local context were used to collect the data. The collected data were coded and entered into a Statistical Package for Social Sciences (SPSS) version 23 database. Data were analyzed, and quantitative variables through descriptive statistics, frequency tables, pie charts, and bar charts were used for establishing the data.

The chi-square test was used to determine the relationship between variables of demographic data, such as previous of premature rapture of membrane and risk factors of PROM. **Ethical Considerations** Ethical approval for this study was obtained from the Al-Mukhtar Committee for Biosafety and Bioethics (MCBB), under the Libyan National Committee for Biosafety and Bioethics, with the reference number NBC: 007.H.25.40, dated 17 April 2025.The research protocol, informed consent form, and all related documents were reviewed and approved by the committee. All participants were informed about the purpose, procedures, and confidentiality of the study. Written informed consent was obtained from all participants prior to data collection. Participation was entirely voluntary, and participants had the right to withdraw from the study at any time without consequences.

Results

Table1:Sociodemographic characteristics of maternal

Items		Frequency	Percent
Age group	16-25 years	26	22.01%
	26-35years	43	36.4%
	36-45 years	42	35.6%
	> 46 years	7	5.9%
	Mean± SD	32.84±8.152	
Level of education	Primary	9	7.6%
	Secondary	26	22.01%
	Graduate	83	70.3%
Family size	Less than 5	71	60.2%
	More than or equal 5	47	38.8%
Number of fetuses	Single	93	78.8%
	Twins	25	21.2%
Occupation status	Employee	64	54.2%
	Not Employee	54	45.8%
Residence	Rural	71	60.2%
	Urban	47	38.8%

The table shows the distribution of people across several demographics. The demographics include age group, level of education, family size, occupation status, and residence. The majority of participants belonged age group(26-35), and followed by the group that between in(36-45) at 36.4% and 35.6% respectively with mean± SD32.84±8.152. As seen in figure above 21.2% of the participants were pregnant with twins, at the same time as majority of them 78.8% had single pregnancy.The majority of participants(70.3%) have a graduate degree. One the one hand, that a slight majority (54.2%) of participants are employed and about45.8% were not employed. The table shows that, more than half (60.2%) have less than 5 members. While the majority of participants (60.2%) live in rural areas.

Table2:Sociodemographic characteristics of maternal

Items		Frequency	Percent
Gestational age in weeks	Less than 37 Weeks (preterm)	83	70.3 %
	37-42 Weeks	21	17.8%
	>42(Post-term)	14	11.9 %
Ever had abortion	Yes	60	50.8%
	No	58	49.2%
Previous premature rupture of membrane	yes	76	64.4%
	No	42	35.6%
Type of abortion	Spontaneous	35	29.7%
	Induce	7	5.9%
	Recurrent	18	15.3%
	No abortion	58	49.2%
Gravidity number	1-5	75	63.6%
	6-13	43	36.4%%
Parity number	1-5	99	83.9%
	6-13	19	16.1%
Vaginal bleeding	Yes	30	25.4%
	No	88	74.6%
Place of last delivery	Health center	20	16.9%
	Hospital	92	78%
	Home	6	5.1%
maternal health service-related characteristics ANC visit > 4 times	Yes	31	26.3%
	No	87	73.7%
health service-related characteristics ANC visit 2-3 times	Yes	83	70.3%
	No	35	29.7%
health service-related characteristics ANC visit 1 time	Yes	11	9.3%
	No	107	90.7%

Table 2 displays the simple according to socio demographic characteristics associated for women with different socio demographic characteristics, (70.3 %) of participants belonged to gestational age Less than 37 Weeks (preterm), (50.8%) of participants ever had abortion. The previously released table demonstrated that, while more than half (64.4%) of the women had PROM while 35.6% did not. The most common type of abortion was Spontaneous abortion 29.7%, it followed by recurrent abortion (15.3%). On the other hand , the majority of participants 63.6%had gravidity number (1-5), while83.9% parity number was83.9%(1-5). The large amount of participant's (78%) delivered their last child at a hospital, followed by health center (16.9%) and home (5.1%). A quarter of the women

(25.4%) experienced vaginal bleeding. The table(2) indicated that, the majority of participant's(70.30%) had two to three ANC visits, and only (9.30%) of them had one visit, while (26.30%) of contributor's had more than 4 visits. For more details in the table

Table3:Sociodemographic characteristics of maternal related to pregnancy

Items		Frequency	Percent
Previous history of preterm birth	Yes	26	22%
	No	92	78%
Placenta abruption	Yes	38	32.2%
	No	80	67.8%
Previous history of cesarean section	Yes	48	40.7%
	No	70	59.3%
Mode of delivery of the last birth	Normal(NVD)	82	69.5%
	C/S	36	30.5%
Statues of outcome	Alive	101	85.6%
	FSB	10	8.5%
	MSB	7	5.9%
Lifting heavy object	Yes	20	16.9%
	No	98	83.10%
Accidental fall during pregnancy	Yes	26	22%
	No	92	78%
Gestational diabetes mellitus	Yes	17	14.4%
	No	101	85.6%
Abnormal vaginal discharge	Yes	62	52.5%
	No	56	47.5%
Urinary tract infection	Yes	77	65.3%
	No	41	34.7%
anemia	Yes	40	40.7%
	No	70	59.3%

According to table (3), It clarified that (78%) of the participants didn't have previous history of preterm birth. While (22%) have experience of previous history of preterm birth. Also (67.8%) of participants didn't have Placenta abruption, but (32.2%) have it. On the one hand, the table illustrate that a breakdown of the data of previous history of c/s, where (40.7%) of mothers had a previous cesarean section, while 59.3% did not. The majority of participant (69.5%) had a normal delivery, while 30.5% had a cesarean section. The greater part of statues of outcome (85.6%) of the newborns were alive, while 8.5% were born fresh stillbirth(FSB) and 5.9% were macerated stillbirth(MSB).According to the previous table, less than quarter(22%) of participants were exposed to an accident fall during pregnancy, (16.90%) of them experience with lifting heavy objects. The previous result on the table(3) showed that (85.60%) of participant's did not have gestational diabetes mellitus and about 14.40% had it. On the other hand, the chart showed that, more than the half of participant's suffered from UTI(urinary tract infection at range of (65.30%). Approximately, (40.70%) suffered from anemia, and more than the half (52.50%)of them had abnormal vaginal discharge.

Table4:Relationship between risk factors and Premature Rupture of Membrane

Risk factor		**Premature Rupture of Membrane**		**P-value**
Maternal health service – related characteristics ANC visit		Yes	**No**	
More or equal four visits	Yes No	19(16.1%) 12(10.2%)	57(48.3%) 30(25.4%)	0.669
Two to three visits		57(48.3%) 26(22.1%)	19(16.1%) 16(13.6%)	0.147
One visit		6(5.1%) 5(4.2%)	70(59.3%) 37(31.4%)	0.518
Medical disorder of maternal				
Urinary tract infection		55(46.6%) 22(18.6%)	21(17.8%) 20(16.9%)	**0.043**
Abnormal vaginal discharge		39(33.1%0 23(19.5%)	37(31.4%) 19(16.1%)	0.848
Gestational diabetes		11(9.3%) 6(5.1%)	65(55.1%) 36(30.5%)	1.000
Anemia		32(27.1%) 16(13.6%)	44(37.3%) 26(22%)	0.700

Falling in accident				
Lifting heavy objects		16(13.6%) 4(3.4%)	60(50.8%) 38(32.2%)	0.130
Accidental fall during pregnancy		17(14.4% 9(7.6%)	59(50%) 33(28%)	1.000

Table5:Relationship between risk factors and Premature Rupture of Membrane

Risk factor		**Premature Rupture of Membrane**		**P-value**
Chronic disease		Yes	**No**	
Diabetes mellitus	Yes No	13(11%) 7(5.9%)	63 (53.4) 35(29.7%)	1.000
Hypertension		28(23.7%) 15(12.7%)	48(40.7%) 27(22.9%)	1.000
Diagnosed polyhydramnios		34(28.8%) 13(11%)	42(35.6%) 29(24.6%)	0.171
Heart disease		4(3.4%) 0 (0%)	72(61%) 42(35.6%)	0.295
Number of foetuses				
Single		58(49.2%)	18(15.3%)	0.258
Twins		35(29.7%)	7(5.9%)	
Uterine and cervical factors				
History of endometriosis pregnancy ulcer		11(9.3%) 2(1.7%)	65(55.1%) 40(33.9%)	0.133
Cervical incompetence		17(14.4%) 6(5.1%)	59(50%) 36(30.5%)	0.339
Cervical cerclage		8(6.8%) 6(5.1%)	68(57.6%) 36(30.5)	0.563
Malformations		7(5.9%) 0(0%)	69(58.5%) 42(35.6%)	**0.050**

According to previous tables(4&5) showed that there was no association the almost of risk factors and premature membrane rupture, with the exception of urinary tract infections(**P=0.043**)and where there were statistically significant differences between malformations and premature membrane rupture (p = **0.050**).

Discussion

Recent global estimates indicate that more than 1 in 10 children, or approximately 15 million children born in 2010, were premature, of whom,over than 1 million died as a result of premature birth and associated complications(12). According to our study, the majority of participant's belonged age 26-35 years at (36.4%), this result consist with similar study was done in Tripoli, where, age group was between 21-30 years 29.70%(13).This result showed similar percentage in Yemen, where majority of maternal age belonged to26- 35year(44.5%)(14).But it also its dissimilarity with the result establish in Franc& Canada, where the maternal age less than the current study and it was 30 in about 4.3%(15). The study revealed that the mother's level of education was high, participants(70.3%) have a graduate degree, greater than that of studies conducted in Canada and France, 39.4% of the sample having completed secondary school, their outcome indicated that they lacked a diploma(15). Moreover, this result dissimilar to study was conducted in Yemen, that indicated that(39.4%) having secondary school(14). The current study has showed that, family size member were less than 5 in about(60.2%), this result disagreement with the result found in Yemen, they were less than five in about (51.6%)(14).This result consist with result confirmed in gorge, they were less than five in about (48. 5%)(16). The our study indicated that the gestational in week was less than 37(preterm),(70.3%), this finding was comparable to that of the study was carried out in Yemen their result was in week less than 37, (71.3%),this result dissimilar percentage to that of the study carried out in Indonesia, of which the result was (37-42), 71.7. %(15).

According to the current study, less than half (45.8%) of participants are not employed, it is comparable to result was carried out in Ethiopia (49.8%) were house wives(17).The current study found that 60.2% of respondents lived in rural areas, which is dissimilar to the another result was done in Yemen at 64.5% were live in urban area(14).Our study found that 49.2% of participants did not undergo an abortion, which is agreement with findings from research conducted in Northeastern Nigeria their result (36.2%.)(18).The present study found that, more than half of maternal(63.6%) had gravidity number from 1 to 5, this finding agreement with study carried out in Yemen, in which (86.8%)were had (1-5). In contrast to Maiduguri, who stated that they had a gravidity number of(34.2%),which reported that their fathers' religion prevented them from choosing their desired number of children or spacing them out, believing that these actions were not in accordance with Islamic customs(19).

The present study found that, more than half of maternal(63.6%) had gravidity number from 1 to 5, this finding agreement with study carried out in Yemen, in which (86.8%)were had (1-5)(14).In contrast to Maiduguri, who stated that they had a gravidity number of(34.2%),which reported that their fathers' religion prevented them from choosing their desired number of children or spacing them

out, believing that these actions were not in accordance with Islamic customs(19).According to our findings, the majority of mothers (83.9%) had parity numbers (1–5) this finding contrasts with the findings of a study conducted in Northeastern Nigeria, which found that the parity number was 42.5%(18).Regarding to the current study, (69.5%) were delivered vaginally. This study's findings are consistent with research conducted at Indonesian institutions, which found that a normal delivery rate was 24.7% and a caesarean section rate was 75.3%(15).According to the current study, from two to three was (70.30%) of prenatal visits. The findings of this investigation are consistent with the 42.1% study conducted in Gorge(20). Our investigation of maternal medical diseases revealed that the most common was urinary tract infection in almost 65.30% of cases. This finding consist with the results observed in Tripoli-Libya, which were 63% of them had urinary tract infections(13).Distribution based on the mother's uterine and cervical factors our findings show that the cervical cerclage is present in approximately 11.9%%, this result similar with result founding in Sana- Yemen(14). on the other hand, it is disagreement with finding in East African(21).In the term of chronic disease, (52.50%) of cases have abnormal vaginal discharge is consistent with another study, reported that(89%) of cases with vaginal discharge presented(22).

The current study, reported that, (40.70%) of cases have anemia. This finding agreement with another study, it established that risk of premature rupture of membrane was higher mothers than in non-anemic mothers(23).Nevertheless, based on the number of fetuses, it was discovered that 79% of the cases had a fetus, and it higher than the result collected by Damien Bouvier(15).

Distribution of sample according to chronic disease, 30.4% of cases have hypertension, and 16,9% have diabetes mellitus, which is slightly similar the study conducted by Bekele et al, 33% of cases have hypertension, and 43% have diabetes(24)

The results of our study showed that there were statistically significant differences (pvalue = 0.045) between urinary tract infection and prior premature rupture of the membrane; however, the results of Slama's study did not support our findings (0.84).

Our study revealed that there were statistically significant between urinary tract infection and previous premature rapture of membrane were p- value (P=0.043), it is consistent with another study, reported that there were statistically significant between urinary tract infection and previous premature rapture of membrane ($p<0.01$)(25) .on the other hand, our study not in the line with study done by Slama their result was no statistically significant differences between were p- value (0.84)(26)

Conclusion

In conclusion, based on the result of this study revealed that the majority of participant's belonged age 26-35 years, mother's level of education was high and they have a graduate degree, Over fifty

percent of the participants had a family size were less than 5 and almost of participant's from two to three were prenatal visits.

maternal medical diseases revealed that the most common was urinary tract infection in almost of cases. According to the risk factors of an early rupture of the membrane, it has been found that most of them had urinary tract infection and ever had abortion have been reported.

P-value < 0.05 indicated statistically significant differences between malformations, and infections of the urinary tract. Therefore, to reduce PROM among pregnant women in the research area, it is important to encourage the use of ANC visits, early detection and treatment of urinary and reproductive tract infections, customized intervention for pregnant women with a history of abortion, and PROM

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State of Libya

Libyan Authority for Scientific Research
Libyan National Committee for Biosafety and Bioethics
Al-Mukhtar Bioethics Committee

دولة ليبيا

الهيئة الليبية للبحث العلمي
اللجنة الوطنية للسلامة الحيوية والأخلاقيات البيولوجية
لجنة المختار للأخلاقيات البيولوجية

الرقم الإشاري:

التاريخ: 2025/04/17م

ETHICAL APPROVAL LETTER

Title of the research protocol: Prevalence of premature rupture of membrane and its associated factors among pregnant women El-Beyda Medical Center-Libya .

Applicant : Faiza A Muhammad Taher

Al-Mukhtar committee for Bio-safety and Bioethics (MCBB) has reviewed and discussed your application to conduct the above mentioned research in Midwifery and neonatal department, the Higher Institute of Medical Sciences and Technologies – Al Bayda

The following submitted documents have been received, reviewed and approved by the Al-Mukhtar committee chairman, and was given this reference number: **NBC: 007. H. 25. 40.**

No	Documents	
1.	Cover letter	√
2.	Ethical approval application form	√
3.	Research protocol and informed consent form	√
4.	Principal investigator/supervisor's CV	√

The approved research protocol, to be conducted in the presented form and we confirm that neither the investigator or the supervisor, nor the co-investigator(s), participating in this research project where involved in voting and decision making.
The MCBB, expect to be informed about:

1. The progress of the research project. 2. Any modifications occurring in the research protocol.

The MCBB is working accordance to its own guidelines and international applicable guidelines.

Yours Sincerely,
Ibrahim S. Milad
Chairman of the MCBB

نسخة إلى الملف الدوري للعام

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