

Risk Factors Management in Women with Premature Rupture of Membrane: A Proposed Protocol

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Abstract

Aim: This study aimed to propose a protocol for management of risk factors in women with premature rupture of membrane (PROM). **Subjects and Methods:** A descriptive design was utilized in this study that was conducted in Menoufia University Hospital and Shebin El-kom Teaching Hospital in the Obstetric Units. A purposive sample composed of 120 women with different ages, education and BMI were recruited from the above mentioned settings. The study tools were: 1) Self-administered questionnaire sheet to assess risk factors of women with PROM (Demographic, obstetric, physical, psychological and social) and women's knowledge about PROM. 2) Hamilton anxiety scale to evaluate studied nurses' anxiety level. **Results:** More than half of studied women had the age of 20 – 40 yrs. and there were many risk factors (Demographic, obstetric, physical, psychological and social) in women with premature rupture of membrane. In addition, many solutions were suggested by them for the management of risk factors. **Conclusion:** There were statistically insignificant differences between both studied hospitals as regards the risk factors among women with PROM, added to their levels of satisfactory knowledge and anxiety. Furthermore, score of Menoufia University Hospital was slightly higher than Shebin El-kom Teaching Hospital. **Recommendations:** Further research study should be done to implement and investigate the effect of the proposed protocol for risk factors management on decreasing the incidence of PROM. **Key words:** Risk factors, PROM, Proposed Protocol

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I. Introduction

Premature rupture of membranes (PROM) is one of the major factors that have been found to correlate with adverse pregnancy outcome, It remains a critically important clinical and public health problem. It is a leading cause of preterm delivery with a third of all preterm births and associated with considerable increase in adverse maternal, fetal and neonatal risk. It is a condition where fluid leaks from the amniotic sac (contains fluid that surrounds and protects the baby in uterus) before labor begins (Nadeau et al., 2016 & Kane et al., 2014).

PROM occur when the fetal membranes rupture early at least one hour before labor has started. Prolonged PROM: a case of premature rupture of membranes in which more than 24 hours has passed between the rupture and the onset of labor. Preterm Premature Rupture of Membranes (PPROM): premature rupture of membranes that occurs before 37 weeks (Jia, 2014 & Greco et al., 2012).

The incidence of PROM which occurs among all births in the United States represent about 10-12%. In all term pregnancies about 8%, prolonged PROM about 20%, preterm deliveries about 30% and rupture of membranes before viability (before 24 weeks) occurs in less than 1% of all pregnancies. Since there are significantly fewer preterm deliveries than term deliveries, the number of cases make up only about 5% of all cases of PROM (Lee et al., 2016 & Teng et al. 2015).

PROM occurs in 5–10% of all pregnancies. Preterm PROM has received considerable attention in the recent obstetric literature, and deservedly so, for it is directly responsible for approximately one-third of all preterm deliveries. Interestingly, however, at least 60% of cases of PROM occur in term patients, and even at this gestational age, clinical management can be surprisingly complicated (Duff, 2016 & Kacerovskiy et al., 2014).

The cause of premature rupture of membranes PROM is not clearly understood, but the following are risk factors that have been shown to increase the chance of it happening. **Infections:** urinary tract infection, sexually transmitted diseases, lower genital infections (ex: Bacterial Vaginosis). **Cigarette smoking** during pregnancy. **Illicit drug use** during pregnancy. Having had PROM or preterm delivery in previous pregnancies. **Hydramnios:** too much amniotic fluid. **Multiple gestation:** being pregnant with two or more fetuses at one time. Having had episodes of bleeding anytime during the pregnancy. **Invasive procedures** (ex: amniocentesis).

Nutritional deficits . Cervical insufficiency: having a short or prematurely dilated cervix during pregnancy . Low socioeconomic status . Being underweight (Lamont , 2015 & Dekker et al. , 2012) .

PROM may cause unborn baby to press on umbilical cord and cut off blood supply. If baby is born before lungs are formed, may have trouble breathing, pneumonia, or other lung problems. It may cause baby to have other life-threatening conditions. Baby may not be in a head-down position, which can make it harder to deliver . Other complications of PROM include : Infection such as infections of the amniotic fluid and membranes . Separation of the placenta from the uterus . Problems with the umbilical cord . Surgical or cesarean section (C-section) delivery (Klein et al., 2014 & Schleussner, 2013) .

Significance of the study:

PROM is one of the most confusing and controversial problems facing clinicians. The exact etiology of PROM is unknown .It is an obstetric problem that lead to serious sequelae in mother and fetus. Therefore, its correct and rapid diagnosis has great importance (Duff , 2016 & Hsu et al., 2013) .

The nurse has a crucial role in the management of PROM and preventing its subsequent fetal, maternal and neonatal complications. Nursing care for the woman experiencing PROM includes prompt and thorough assessment of the women on admission to the hospital, obtaining or assisting in collection of laboratory specimens and administration of prescribed medications and therapies (Scott et al. , 2013 & Elizabeth , 2011).

Aim of the study:

This study aims to propose a protocol for management of risk factors in women with premature rupture of membrane through the following :

- Assess of risk factors among women with PROM (Demographic , obstetric , physical, psychological and social).
- Assess of studied women's knowledge about PROM .
- Assess studied women's level of anxiety .
- Obtain the suggested solutions for risk factors from the studied womens
- Propose a protocol for management of risk factors among women with PROM .

Research questions:

- What are the risk factors among women with PROM ?
- What are the level of knowledge and anxiety among the studied women ?
- Is there a relation between the risk factors among the studied women and the proposed protocol ?

Subjects and Methods:

Operational definitions:

Risk factors : Includes demographic , obstetric , physical, psychological and social items).

Protocol: Is a set of “Rules” and “Regulations” for sending and receiving information by using the standard protocols.

Research Design: A descriptive design was used for the conduction of this study.

Setting: This study was conducted in the following hospitals: Menoufia University Hospital and Shebin El-kom Teaching Hospital in the Obstetric Units

Subjects: A purposive sample was composed of 120 women with different ages, education and BMI . They were taken as follows:

Menoufia University Hospital :

Women (n= 60) : taken from Obstetric Unit and Outpatients` Clinics .

Shebin El-kom Teaching Hospital :

Women (n= 60) : taken from Obstetric Unit and Outpatients` Clinics .

They were taken from the previously mentioned settings as follows:

Inclusion criteria for the studied women :

- Women willing to participate in the study
- Women with PROM
- No co morbid condition

Tool of Data Collection:

1- Self-administered questionnaire sheet that was designed by the researchers after reviewing related literature and consulting experts. It was written in simple Arabic language and divided into the following parts :

Part I: Characteristics of the studied women as regards age, qualifications , BMI , job and smoking .

Part II: Risk factors assessment sheet. It included series of questions related to the risk factors among the studied women (Demographic , obstetric , physical, psychological and social).

Demographic risk factors : Age , BMI , heavy smoker , education , social standard and financial burden .

Obstetric risk factors (past history) : Multiple pregnancy , mode of delivery(Cesarean section) , polyhydramnios , antepartum hemorrhage , previous history of preterm delivery , prior cervical surgery , maternal complications , trauma , congenital abnormalities , mal presentation and sexually transmitted disease .

Obstetric risk factors (present history) : Duration of pregnancy , unwanted pregnancy , number of fetus , hypertension / fever / edema , abortion , cervical incompetence , chorioamnionitis , intercourse (sexual activity) , cervical / vaginal infection , RH.negative , pre- existing medical illness .

Physical risk factors : Heavy physical activities , poor nutrition , improper hygiene , sleeping disturbance , irregular follow up visits , traveling and transferring

Psychological risk factors : Anxiety / depression , nervous / poor coping , fear from labor , incorrect information , fear from complications , decrease sense of safety and security , poor health condition adjustment .

Social risk factors : Strenuous work stress , decrease social support/ relations , decrease recreational activities , poor communication with health care team (Medical and nursing staff) , difficulties with traveling and transferring .

Scoring system :

Answers of the studied women regarding the presence of risk factors (scored as two marks) or absence (scored as one mark) and then categorized into either yes or no.

The total items of risk factors = 47 , whereas absence of risk factors was considered from (1– 47) and presence of risk factors from (47 - 94).

Part III: Women's knowledge assessment sheet which included the following : Definition / importance of PROM , risk factors of PROM , priorities of care , effect of PROM on mother / fetus , life style changes , regular antenatal care , correct times for follow up and suitable nutrition

Scoring system :

The satisfactory level was considered from 60% , while the unsatisfactory level was less than 60%.

2- An opinionaire sheet for studied women to obtain the solutions in relation to risk factors : It included awareness for newly pregnant women , nutrition , communication with health care team , anxiety and worries from labor , health insurance support , physical activities , follow up visits and emergent call .

Content validity:

It was assured by a group of experts from Maternal and Newborn health nursing . Their opinions were collected as regards to tools format layout, consistency and scoring system. Tools` contents were tested regarding to the knowledge accuracy, relevance and competence .

II. Ethical considerations

Approval was obtained from Directors of the above mentioned settings in the planning stage. All women were informed about the study and their rights according to medical research ethics to participate or not in the study. Then they consent to participate in the study .

Pilot study:

A pilot trial was conducted on 10% of the total study subjects to test the clarity and practicability of the tools, in addition to sample and settings. Pilot sample were later included in the study as there were no radical modifications in the tools.

Procedure:

- The study was started and completed within 6 months.
- Aim of the study was simply explained to the studied women at first.
- The researchers started to collect data from them at the above mentioned settings using the pre constructed tools till completion of data collection.
- Data were collected 2 days/week at morning and afternoon shift
- The questionnaire was filled by the researcher according to studied women understanding and health condition as follows :
 - Risk factors assessment sheet
 - Women`s knowledge assessment sheet
- All studied women were assessed individually or in groups that entail 4-6 women according to their physical and mental readiness using the previously mentioned study tools.

- The proposed protocol was designed based on analysis of the actual women's opinions assessment by using the pre constructed tools.
- Content of the proposed protocol was consistent with the related literatures (national and international).
- The proposed protocol was cover the following items:
 - Demographic , obstetric , physical, psychological and social obstacles for the studied women .
 - Knowledge of the studied women
- Testing validity of the proposed tools using face and content validity.

Statistical analysis:

Data were organized, tabulated and analyzed using number, percentage, mean and standard deviation and t-test. Level of significance was threshold at 0.05 .

III. Results:

Table (1): Presents characteristics of the studied women, this table clarified that three fifths (60.0) of them had the age from 20 – 40 yrs. . Concerning education and BMI , one third of them had low education and with overweight (33.3 & 29.2 respectively) . As regards income , three fourths (75.0) of them were with not enough income . In relation to smoking , about one third of them was smoke .

Table (2): Shows demographic risk factors among the studied women on different hospitals. Results revealed a statistically insignificant difference between two hospitals ($t=0.37, p> 0.05$), whereas mean number of Menoufia University Hospital was slightly higher than Shebin El-kom Teaching Hospital (28.7 ± 6.9 & 28.2 ± 7.8 respectively) . Moreover , financial burden , age less than 20yrs and more than 40 yrs represent the highest percentage of risk factors in both hospitals .

Table (3): Clarifies obstetrics (past history) risk factors among the studied women on different hospitals. Results revealed a statistically insignificant difference between two hospitals ($t= 0.99, p> 0.05$), whereas mean number of Menoufia University Hospital was slightly higher than Shebin El-kom Teaching Hospital (31.8 ± 5.7 & 30.8 ± 5.3 respectively). Moreover, mode of delivery , previous history of preterm delivery and maternal complications represent the highest percentage of risk factors in both hospitals .

Table (4): Clarifies obstetrics (present history) risk factors among the studied women on different hospitals. Results revealed a statistically insignificant difference between two hospitals ($t= 0.50, p> 0.05$), whereas mean number of Menoufia University Hospital was slightly higher than Shebin El-kom Teaching Hospital (37.1 ± 6.5 & 36.5 ± 6.5 respectively). Moreover, hypertension / fever / edema and cervical / vaginal infection represent the highest percentage of risk factors in both hospitals .

Table (5): Shows physical risk factors among the studied women on different hospitals. Results revealed a statistically significant difference between two hospitals ($t=1.32, p> 0.05$), whereas mean number of Menoufia University Hospital was slightly higher than Shebin El-kom Teaching Hospital (51.8 ± 3.0 & 51.0 ± 3.7 respectively) . Moreover , heavy physical activities , poor nutrition , traveling and transferring represent the highest percentage of risk factors in both hospitals .

Table (6): Shows psychological risk factors among the studied women on different hospitals. Results revealed a statistically insignificant difference between two hospitals ($t=0.54, p> 0.05$), whereas mean number of Menoufia University Hospital was slightly higher than Shebin El-kom Teaching Hospital (51.5 ± 2.7 & 51.2 ± 3.4 respectively) . Moreover, fear from labor , incorrect information and fear from complications represent the highest percentage of risk factors in both hospitals .

Table (7): Presents social risk factors among the studied women on different hospitals. Results revealed a statistically insignificant difference between two hospitals ($t=0.81, p> 0.05$), whereas mean number of Menoufia University Hospital was slightly higher than Shebin El-kom Teaching Hospital (41.5 ± 7.4 & 40.5 ± 6.0 respectively) . Moreover, strenuous work stress, difficulties with traveling and transferring , added to decreased recreational activities represent the highest percentage of risk factors in both hospitals .

Figure (1): Presents anxiety level among the studied women on different hospitals. As shown more than half of them had sever anxiety , one third of them had moderate anxiety and the minority had mild anxiety . Moreover , Menoufia University Hospital was slightly higher than Shebin El-kom Teaching Hospital .

Table (8): Reveals studied women's satisfactory knowledge about PROM on different hospitals. Results revealed a statistically insignificant difference between two hospitals ($t=0.86, p> 0.05$), whereas mean number of Menoufia University Hospital was slightly higher than Shebin El-kom Teaching Hospital (11.6 ± 4.8 & 11.3 ± 4.7 respectively) . Moreover, effect of PROM on mother / fetus , risk factors of PROM and suitable nutrition represent the highest percentage of satisfactory knowledge in both hospitals .

Table (9): Shows suggested solutions in relation to PROM as reported by studied women . Results revealed insignificant difference as regards the suggested solution : Awareness program , sufficient nutrition , communication with health care team, relieve anxiety , decrease physical activities and continuous follow - up ($t = 0.98, p>0.05$) .

Result :

Table 1: Characteristics of women under the current study (n=120)

Items		No	%
Age/yrs.	20 -< 40	72	60.0
	40 & more	48	40.0
Education	High	44	36.7
	Moderate	36	30.0
	Low	40	33.3
BMI	Under weight (<18.5kg)	55	45.8
	Normal weight (18.5 – 25 kg)	30	25.0
	Over weight (>25)	35	29.2
Job	Employed	42	35.0
	Unemployed	78	65.0
Income	Enough	30	25.0
	Not enough	90	75.0
Smoking	Present	36	30.0
	Not present	84	70.0

Table (2) : Presentation of demographic risk factors among the studied women

Demographic	Menoufia University Hospital (n = 60)		Shebin El-kom Teaching Hospital (n = 60)	
	No	%	No	%
Age less than 20yrs	36	60.0	37	61.7
Age more than 40 yrs	35	58.3	34	56.6
High body mass index	28	46.7	27	45.0
Smoker	18	30.0	16	26.7
Decrease educational level	31	51.7	32	53.3
Low social standard	24	40.0	23	38.3
Increase financial burden	45	75.0	44	73.3
Mean No ± SD	28.7±6.9		28.2±7.8	
% of Mean	47.8%		47.0%	
T test	0.37 > 0.05 (Insig.)			
P value				

Table (3): Presentation of obstetrics (past history) risk factors among the studied women

Past obstetric history	Menoufia University Hospital (n = 60)		Shebin El-kom Teaching Hospital (n = 60)	
	No	%	No	%
Multiple pregnancy	32	53.3	31	51.7
Mode of delivery(Cesarean section)	38	63.3	36	60.1
Polyhydramnios	31	51.7	30	50.0
Antepatum hemorrhage	34	56.7	33	55.0
Previous history of preterm delivery	37	61.7	35	58.3
Prior cervical surgery	29	48.3	28	46.7
Maternal complications	36	60.0	35	58.3
Trauma	27	45.0	28	46.7

Congenital abnormalities	19	31.7	18	30.0
Mal presentation	35	58.3	34	56.7
Sexually transmitted disease	20	33.3	19	31.7
Mean No ± SD	31.8 ± 5.7		30.8±5.3	
% of Mean	53.0 %		51.3%	
T test P value	0.99 > 0.05			

Table (4): Presentation of obstetrics (present history) risk factors among the studied women

Present obstetric history	Menoufia University Hospital (n = 60)		Shebin El-kom Teaching Hospital (n = 60)	
	No	%	No	%
	Duaration of pregnancy	37	61.7	38
Un wanted pregnancy	31	51.7	32	53.3
Number of fetus	33	55.0	31	51.7
Hypertension / fever / edema	49	81.7	48	80.0
Abortion	34	56.7	35	58.3
Cervical incompetence	35	58.3	36	60.0
Chorioamnionitis	36	60.0	34	56.7
Intercourse(sexual activity)	38	63.3	36	60.0
Cervical / vaginal infection	48	80.0	47	78.3
RH.negative	30	50.0	28	46.7
Pre- existing medical illness	37	61.7	36	60.0
Mean No ± SD	37.1±6.5		36.5±6.5	
% of Mean	61.8 %		60.8 %	
T test P value	0.50 >0.05			

Table (5): Presentation of physical risk factors among the studied women

Physical	Menoufia University Hospital (n = 60)		Shebin El-kom Teaching Hospital (n = 60)	
	No	%	No	%
	Heavy physical activities	56	93.3	55
Poor nutrition	53	88.3	54	90.0
Improper hygiene	50	83.3	49	81.7
Sleeping disturbance	48	80.2	46	76.7
Irregular follow up visits	52	86.7	51	85.0
Traveling and transferring	54	90.0	53	88.3
Mean No ± SD	51.8 ±3.0		51.0±3.7	
% of Mean	86.3 %		85 %	
T test P value	1.32>0.05			

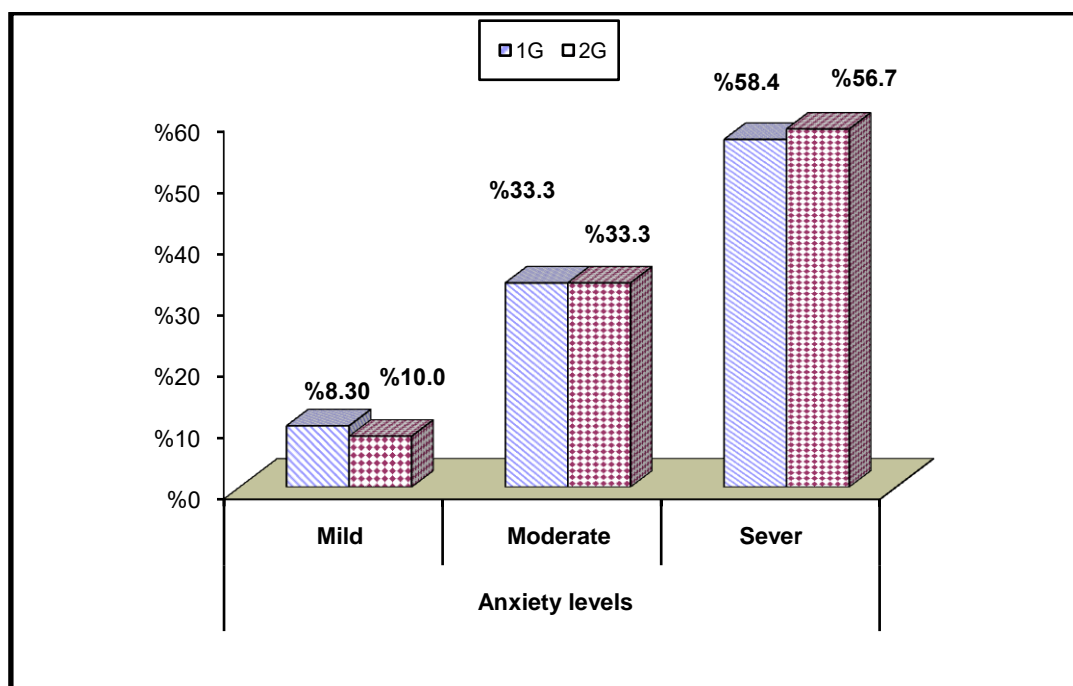
Table (6): Presentation of psychological risk factors among the studied women

Psychological	Menoufia University Hospital (n = 60)		Shebin El-kom Teaching Hospital (n = 60)	
	No	%	No	%
	Anxiety / Nervous	48	80.0	49
Poor coping	51	85.0	50	83.3

Fear from labor	55	91.7	57	95.0
Incorrect information	53	88.3	52	86.7
Fear from complications	53	88.3	52	86.7
Decrease sense of safety and security	49	81.7	47	78.3
Poor health condition adjustment	50	83.3	48	80.0
Mean No ± SD	51.5±2.7		51.2±3.4	
% of Mean	85.8%		85.3%	
T test	0.54 >0.05			
P value				

Table (7): Presentation of social risk factors among the studied women

Social	Menoufia University Hospital (n = 60)		Shebin El-kom Teaching Hospital (n = 60)	
	No	%	No	%
Strenuous work stress	51	85.0	49	81.7
Decrease social support/ relations	33	55.0	35	58.3
Decrease recreational activities	42	70.0	40	66.7
Poor communication with health care team (Medical and nursing staff)	40	66.7	38	63.3
Difficulties with traveling and transferring	47	78.3	45	75.0
Mean No ± SD	41.5±7.4		40.5±6.0	
% of Mean	69.2 %		67.5 %	
T test	0.81 >0.05			
P value				



G1 :Menoufia University Hospital

G2 :Shebin El-kom Teaching Hospital

Fig. (1): Presentation of anxiety levels among the studied women

Table (8): Presentation of studied women's satisfactory knowledge about PROM

Items	Women's satisfactory knowledge			
	Menoufia University Hospital (n = 60)		Shebin El-kom Teaching Hospital (n = 60)	
	No	%	No	%
Definition / Importance of PROM	12	20.0	11	18.3
Risk factors of PROM	15	25.0	16	26.7
Priorities of care	6	10.0	5	8.3
Effect of PROM on mother / fetus	20	33.3	18	30.0
Life style changes	10	16.7	11	18.3
Regular antenatal care	7	11.7	6	10.0
Correct times for follow up	11	18.3	12	20.0
Suitable nutrition	15	25.0	13	21.7
Mean No ± SD	11.6± 4.8		11.3±4.7	
% of Mean	19.3%		18.8%	
T test	0.86 >0.05			
P value				

Table (9): Suggested solutions as reported by the studied women in relation to PROM risk factors

Suggested solutions	Menoufia University Hospital (n = 60)		Shebin El-kom Teaching Hospital (n = 60)	
	No	%	No	%
Continuous awareness program for newly pregnant women	48	80.0	47	78.3
Sufficient nutrition supplement	52	86.7	51	85.0
Good communication with health care team	50	83.3	52	86.7
Relive anxiety and worries from labor	47	78.3	46	76.7
Health insurance support	45	75.0	44	73.3
Decrease physical activities	50	83.3	49	81.7
Continuous follow up visits and emergent call	53	88.3	52	86.7
Mean No ± SD	48.7 ± 2.5		48.2 ± 3.1	
% of Mean	81.2 %		80.3 %	
T test	0.98			
P value	>0.05			

IV. Discussion

Premature rupture of membranes (PROM) is spontaneous rupture of membranes at any time before the onset of labor pains irrespective to the gestational age . PROM happens in many premature births and a baby born too early may have many serious problems (Duffet al., 2016 and Kugelman et al. , 2013) .

The present study aimed to propose a protocol for management of risk factors in women with premature rupture of membrane . As regards demographic risk factors, the current study presented a significant indifference among the previously mentioned hospitals. Women reported that, their pregnancy is affected negatively by age , BMI , heavy smoker , education , social standard and financial burden . Nadeau et al.(2016)found that demographic risk factors such as young or advanced age were associated with premature rupture of membranes and preterm labor .In addition , the women who had primary level of education or no education at all were two times likely to develop PROM as women who had secondary or higher level of education . Jia (2014) clarified that the association of low socioeconomic status and PROM could be due to poor nutrition and stressful life conditions which may lead to over reactivation of the sympathetic nervous system.

Considering obstetric risk factors (past history) . Results revealed a significant indifference among the previously mentioned hospitals. Women in mentioned hospitals reported that their pregnancy is affected negatively by multiple pregnancy , mode of delivery(cesarean section) , polyhydramnios , antepatum hemorrhage , previous history of preterm delivery , prior cervical surgery , maternal complications , trauma , congenital abnormalities , mal presentation and sexually transmitted disease . Dodd et al. (2013) and Mohangoo et al. (2010) stated that many genes play a role in inflammation and collagen production , therefore inherited genes may play a role in predisposing a women to PROM .

As regards obstetric risk factors (present history) . Results revealed a significant indifference among the previously mentioned hospitals . Women in mentioned hospitals reported that their pregnancy is affected negatively by duration of pregnancy , unwanted pregnancy , number of fetus , hypertension / fever / edema , abortion , cervical incompetence , chorioamnionitis , intercourse (sexual activity) , cervical / vaginal infection . there is a higher incidence of PROM in primiparous than multiparous mothers . **Lee et al. (2016) and O'Brien et al. (2009)** mentioned that women with PROM at any age are at high risk of infection because the membranes are open and allow bacteria to enter. Women are checked often (usually every 4 hours) for signs of infection .

Concerning physical risk factors results revealed a significant indifference among the previously mentioned hospitals. Women in mentioned hospitals reported that their pregnancy is affected negatively by heavy physical activities , poor nutrition , improper hygiene , sleeping disturbance , irregular follow up visits , traveling and transferring . These findings were supported by **Wang et al. (2015)** who pointed out that, prolonged walking or standing, strenuous working conditions and long weekly work hours were factors associated with premature rupture of membranes . In addition , about 25% followed the standard visiting schedule during , 57% made more visits, and 17% fewer visits . **Lamont (2015)** reported that vitamin C supplementations after 14th weeks of gestation can prevent from complications in women with the history of pre term PROM.

As regards psychological risk factors, the current study presented a significant indifference among the previously mentioned hospitals. Women reported that, their pregnancy is affected negatively by anxiety / depression , nervous / poor coping , fear from labor , incorrect information , fear from complications , decrease sense of safety and security , poor health condition adjustment . This findings could be attributed to the reports of nurses about short stay of the women in the hospital , also the researchers observed that there is no psychological preparations by the nurses . **Lee et al. (2016)** cleared that, psychological preparation play a vital role in the successful outcome and psychological assessment should be made to assist in alleviating any worries

Concerning anxiety assessment , the current study indicated that more than half of the women had severe anxiety. This result may be due to lack of psychological preparation and other cases fear from complications . The previous findings confirmed by **Kacerovsky et al. (2014)** and **Elizabeth (2011)** who listed that majority of the nurses perform psychological preparation incorrectly and stressed on the value of the women preparations in reducing anxiety. He also adds that, anxiety results when women are unable fully to comprehend the world around their condition .

Regarding social risk factors, findings revealed an insignificant difference among the previously mentioned hospitals. Women reported that their pregnancy is affected negatively by strenuous work stress , decrease social support/ relations , decrease recreational activities , poor communication with health care team (medical and nursing staff) , difficulties with traveling and transferring . **Teng et al. (2015)** recognized that, building up relationships with women will allow discussing the problems confidentially. So it is essential to use an efficient interaction with women stayed for a short period in the hospital .

In relation to studied women satisfactory knowledge about PROM . Findings revealed an insignificant difference among the previously mentioned hospitals in the following items : definition / importance of PROM , risk factors of PROM , priorities of care , effect of PROM on mother / fetus , life style changes , regular antenatal care , correct times for follow up and suitable nutrition . **Scott et al. (2013)** reported that there was lack of knowledge with regard to PROM and its association with premature births and quality of information provided to the women about pregnancy with risk of PROM during prenatal care was inadequate or not appropriate to their level of understanding .

In addition , **Wang et al. (2015)** carried out surveys on women's experiences risk of PROM and found that 77% had lacking knowledge of PROM , 50% did not appreciate seriousness of the condition. The quality and readability of information needs to be appropriate for women with varying levels of health literacy .

V. Conclusion

Overall , the current study concluded that there were statistically insignificant differences between both studied hospitals as regards risk factors among women with PROM (Demographic , obstetric , physical, psychological and social) . added to their level of satisfactory knowledge and anxiety level . Furthermore, score of Menoufia University Hospital was slightly higher than Shebin El-kom Teaching Hospital . .

VI. Recommendations

The proposed protocol of women's risk factors management that's evidence based should be implemented and evaluated in relation to the incidence of PROM complications.

- An orientation program should be prepared for the womens' with PROM

- Women`s are in need to a simplified illustrated and comprehensive Arabic booklet including information about PROM .
- Further research study should be done to implement and investigate the effect of the proposed protocol for risk factors management on decreasing the incidence of PROM.
- **Based on findings of the present study, risk factors management protocol has been proposed (Appendix I).**

Appendix I

A developed management protocol for risk factors in women with premature rupture of membrane (PROM)

Kane et al. (2014), Scott et al. (2013), Dekker et al. (2012) and Elizabeth (2011)

Purpose:

It is to outline nursing responsibilities on risk factors management in women with premature rupture of membrane (PROM) .

Expected women outcomes:

- Prevent PROM by decreasing the risk factors
- Women will experience reducing level of anxiety.
- Women will follow prescribed management and safety precautions.

Who is at risk for PROM ?

The following may increase the risk :

- Having a preterm birth in a previous pregnancy
- Having an infection in reproductive system
- Vaginal bleeding during pregnancy
- Smoking during pregnancy

Initial assessment :

- There is a vaginal bleeding
- The liquor is green or offensive
- Women feels unwell or has a raised temperature
- The fetal movements are reduced
- Presentation was not cephalic at the last antenatal visit
- Women has a history of group B streptococcus (GBS) carriage in this pregnancy or has a past history of a neonate affected by GBS
- There are maternal complications
- History of previous caesarean section
- Women has a multiple pregnancy

Ongoing assessment :

The woman should be seen as soon as within 12 hours of rupture of membranes

The following assessment should take place:

- Confirm PROM from the woman`s description and visulisation of the liquor .
- Confirm diagnosis with a sterile speculum examination if no liquor has been seen.
- Avoid digital vaginal examination in the absence of good contractions
- Auscultate the fetal heart and enquire about fetal movement pattern
- Perform maternal observations including temperature and pulse rate and respiratory rate if applicable.

In patients care :

Diagnoses of PROM

Women may need any of the following

- A vaginal exam may show if women are leaking amniotic fluid or if cervix is dilated.
- A sample of vaginal fluid may show if there are leaking amniotic fluid or infection .
- Blood and urine tests may show infection.
- An ultrasound uses sound waves to show pictures on a monitor , location of the placenta and how much amniotic fluid is in uterus.
- An amniocentesis may show if baby's lungs are developed enough for delivery and check for infection in uterus .
- Monitoring baby's heart beat and contractions of uterus .

Treatment of PROM

- The goal of treatment is to delay delivery of baby if possible. Women may need any of the following:
- Hospital stay and bed rest
- Monitor for :
- Signs of labor or contractions

- Baby's movement, heart rate and other tests
- Symptoms of infection. (fever and pain)
- Informed consent
- An IV
- Wear pressure stockings to improves blood flow and helps prevent clots.

Medicines :

- Antibiotics help treat or prevent an infection caused by bacteria.
- Oxytocin is used to start contractions . It may be used at any time after membranes have ruptured.
- Tocolytic medicines . These are used to stop preterm labor.
- Steroids are given between 24 and 34 weeks gestation to help unborn baby's lungs develop faster.
- Vaginal delivery or C-section may be needed.

Ongoing management

- During the 24 hour period prior to induction of labour the woman should be advised to:
 - Check temperature every 4 hours and report a raised temperature of over 37.4°C, any change in colour or smell of vaginal loss or any concern about fetal movement pattern
 - Bathing and showering decrease risk of infection
 - Avoid sexual intercourse

Discharge instructions :

Activity:

- Bed rest: Women may need to stay in bed all the time and allowed to get up briefly to go to the bathroom .
- Pelvic rest: Women not put anything in vagina, such as tampons and sex.
- Temperature monitoring: A fever may be a sign of infection.

Contact doctors if :

- Have discharge from vagina that smells bad.
- Have a fever.
- Uterus feels tender.
- Heart is beating very fast.
- Losing weight.

Seeking care immediately if women:

- Feel a gush or trickle of fluid leaking from your vagina.
- Have bleeding from vagina.
- Have strong pains in abdomen.
- Arm or leg feels warm, tender and painful . It may look swollen and red .
- Suddenly feel lightheaded and short of breath.
- Have chest pain when take a deep breath or cough (may cough up blood) .

References

- [1] Dekker,G. , Lee, S. , North,R. McCowan,L. , Simpson,B. & Roberts, C. (2012) : Risk factors for preterm birth in an international prospective cohort of nulliparous women, PLoS ONE, 7(9):p. 64 .
- [2] Dodd, J. , Jones,L. , Flenady,V. Cinotta , R. & Crowther, C. (2013) : Prenatal administration of progesterone for preventing preterm birth in women considered to be at risk of preterm birth, Cochrane Database of Systematic Reviews , 7(63) : p. 45 .
- [3] Duff , P. (2016): Management of Premature Rupture of the Membranes in Term Patients . The Global Library of Womens` Medicine , 10(38): pp. 1756-2228.
- [4] Elizabeth, S. (2011): Manual of high risk pregnancy and delivery, 5thed, Mosby. Jaypee Brothers Medical Publishers, pp. 110-6 .
- [5] Greco,E. , Gupta,R. , Syngelaki, A. Poon,L. & Nicolaidis,K. (2012) : First-trimester screening for spontaneous preterm delivery with maternal characteristics and cervical length , Fetal Diagnosis and Therapy, 31(3) : pp. 154–61 .
- [6] Hsu, T. , Lin,H. & Lan , K. (2013): High interleukin-16 concentrations in the early second trimester amniotic fluid: an independent predictive marker for preterm birth , Journal of Maternal-Fetal and Neonatal Medicine, 26 (3): pp. 285–9 .
- [7] Jia,X. (2014): Value of amniotic fluid IL-8 and Annexin A2 in prediction of preterm delivery in preterm labor and preterm premature rupture of membranes, The Journal of Reproductive Medicine, 59(3-4): pp. 154–60 .
- [8] Kacerovsky,M. , Lenco,G. & Musilova , I. (2014) : Proteomic biomarkers for spontaneous preterm birth: a systematic review of the literature, Reproductive Sciences , 21(3) : pp. 283–95 .
- [9] Kane,S. , da Silva Costa, F. & Brennecke, S. (2014) : First trimester biomarkers in the prediction of later pregnancy complications, BioMed Research International, 20 (53): 6 pages.
- [10] Klein,J. , Buffin-Meyer,B. & Mullen , W. (2014): Clinical proteomics in obstetrics and neonatology,” Expert Review of Proteomics, 11(1) : pp. 75–89, 2014.
- [11] Kugelman , A. & Colin, A. (2013) : Late preterm infants: near term but still in a critical developmental time period , Pediatrics, 132 (4) : pp. 741– 51 .
- [12] Lamont , R. (2015): Advances in the prevention of infection-related preterm birth . Front Immunol, 6 (20): p. 566
- [13] Lee ,W. , Yeh,C. & Wang , P. (2016) : Did self-sampling improve the adherence to group B streptococci screening in pregnant women? . J Chin Med Assoc, 15 (79): pp. 51-3 .
- [14] Mohangoo, A. , Lanting , C. , Bennebroe , K. & Buiterdijk , S. (2010): Contribution of congenital anomalies to preterm birth risk in the Netherlands: 457. pediatric research . Nov , PP. 234-5 .

- [15] **Nadeau , H. , Subramaniam , A. & Andrews ,W. (2016):** Infection and preterm birth . Semin Fetal Neonatal Med, 21 (46): pp. 100-5 .
- [16] **O'Brien, J. , DeFranco, E. & Adair , C. (2009) :** Effect of progesterone on cervical shortening in women at risk for preterm birth: secondary analysis from a multinational, randomized, double-blind, placebo-controlled trial, Ultrasound in Obstetrics and Gynecology, 34(6) : pp. 653 – 9 .
- [17] **Schleussner, E. (2013) :** The prevention, diagnosis and treatment of premature labor , DeutschesArzteblatt International, 110: pp. 227 – 35 .
- [18] **Scott R, Terriky,L. & susanc , F. (2013):** Maternity and pediatric Nursing, 2nd ed. Lippincott Williams. Chapter 9 , PP. 215-20 .
- [19] **Teng ,S. , Lee, W. & Li , Y. (2015) :** An echo of an important but often neglected issue-late preterm births Taiwan J ObstetGynecol, 54 : p. 213
- [20] **Wang, P. ,Yeh, C. & Chen, Y. (2015):** Maternal serum markers and preeclampsia . Taiwan J ObstetGynecol, 54 pp. 339-40

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