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"Study on The Effectiveness of Iron, Folic Acid, Vitamin B Complex And C for Reducing The Risk of Pre-Mature Ruptures of Membrane in Pregnancy"

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Abstract:
Background: *Preterm premature rupture of membranes (PPROM) is one of the most important complications of the pregnancy and cause perinatal morbidity and mortality. Iron, Folic acid, Vitamin B Complex and Vitamin C plays an important role in collagen metabolism and increases resistance maintenance of the chorioamniotic membranes.*
Objectives: *The aim of this study is to assess the effectiveness of Iron, Folic acid, Vitamin B Complex and Vitamin C for reducing the risk of Pre-mature Ruptures of membrane in pregnancy.*
Patients and Methods: *This clinical trial study was performed on 200 pregnant women with the history of PPROM, with singleton pregnancy and gestational age 14 weeks in a hospital in Dhaka City during February 2015 to January 2016. They were randomly divided into two groups. in the case group, 100 women prescribed 400µg folic acid daily in the first trimester, then iron tablet containing 30 mg elemental iron , chewing tablet of 100 mg vitamin C, Vitamin B complex daily were added from 14th weeks of gestation [and was continued up to 37th weeks and control group, 100 patients were treated similar except for chewing tablet of placebo insist of same shape of structured questionnaire.*
Results:
PPROM occurred in 44.7% of controls and 31.8% of cases. PROM occurred in 34.1% of controls and 18.8% of cases and mean gestational age at delivery (week) in control group 35.9 ± 2.8 and in the case group 37.1 ± 1.9. Rupture of membranes was significantly decreased in the case group.
Keywords*: PPROM, Ascorbic Acid, Pregnancy, Collagen, Premature Rupture, Prevention and Control*

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I. Introduction

Premature rupture of membranes (PROM) alludes to a patient who is past 37 weeks' incubation and has given burst of layers (ROM) preceding the beginning to the onset of labor.[1] Premature rupture of membranes defined as leakage of amniotic fluid through ruptured chorioamniotic membranes that occur before starting the labor pain at any gestational age. It is a standout amongst the most widely recognized issues in obstetrics and influences 10-20% of all pregnancies. Preterm untimely burst of films (PPROM) is ROM before 37 weeks' growth require. Eighty-five percent of neonatal dreariness and mortality is a consequence of rashness. PPROM is related with 30-40% of preterm conveyances and is the main identifiable reason for preterm conveyance. PPROM confounds 3% of all pregnancies and happens in around 150,000 pregnancies yearly in the United States.[2] At the point when PPROM happens remote from term, huge dangers of dismalness and mortality are available for both the embryo and the mother, insufficient accessibility of a few supplements amid pregnancy, for example, zinc, iron, β-carotenes, folic acid, vitamin E, and vitamin C have been recognized as risk factors for PPROM and low birth-weight.[3] Iron &Vitamin C is associated with collagen synthesis, collagen secretion and collagenolysis-processes.[4]

Event of PPROM has been related with changed examples of collagen synthesis. Folic acid, or folate, is a critical B vitamin for the strength of unborn infant. It keeps certain abnormalities of the mind, skull and spine called neural tube defect. Neural tube defect incorporate spina bifida and anencephaly. It is essential for all women who could wind up noticeably pregnant to take folic acid. A few investigations have demonstrated that

there were bring down levels of Iron, Folic acid, Vitamin B Complex and Vitamin C (ascorbic acid) in serum, leucocytes, and amniotic liquid of cases with PPROM when contrasted with the control group.[5] But they have given little data about the connection between iron, folic acid, vitamin B complex and C admission and its part in PPROM. The point of this investigation is to assess the part of Iron, Folic acid, Vitamin B Complex and Vitamin C in prevention of PPROM.

II. Objective

The aim of this study is to assess the effectiveness of Iron, Folic acid, Vitamin B Complex and Vitamin C for reducing the risk of Pre-mature Ruptures of membrane in pregnancy.

III. Patients And Methods

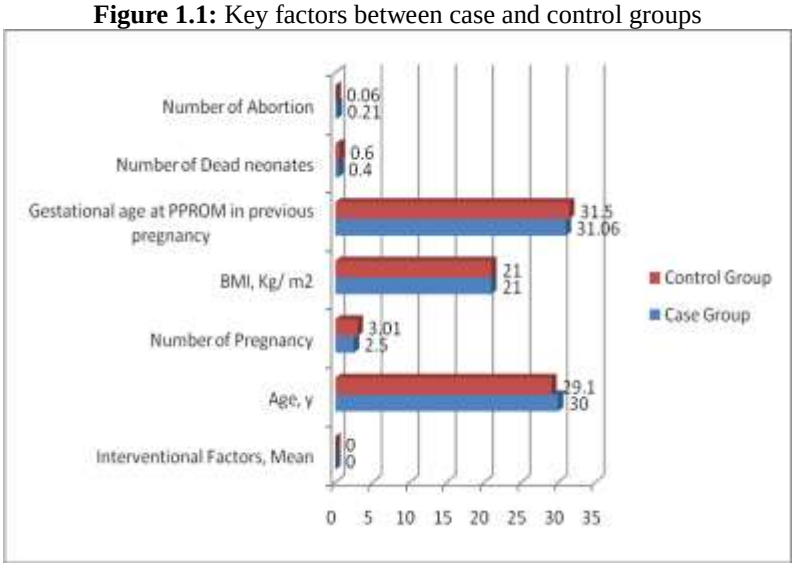
Two hundred pregnant women with 14 weeks gestational age and the history of at least one PPROM with singleton pregnancy were enrolled in this clinical trial, after being completely explained about study conditions and signing informed consent. The study was followed the ethical consideration and was performed in hospital during a time period of February 2015 to January 2016 Inclusion criteria was the history of at least one PPROM in previous pregnancies, body mass index (BMI) of 18.5-30 kg/m2, singleton pregnancy, normal fetus and normal amniotic fluid insonography, mother age of 18-35yrs, normal cervix length (more than 25mm), no Tobacco usage, and no consumption of iron, Vitamin C, folic acid and vitamin B complex. The patients were divided randomly into two groups such as 100 women in the case group, 400µg folic acid daily was prescribed in the first trimester, then iron tablet containing 30 mg elemental iron chewing tablet of 100 mg vitamin C, Vitamin B complex daily were added from 14th weeks of gestation [6] and was continued up to 37th weeks.

In control group, 100 patients were treated similar except for chewing tablet of placebo insist of same shape of structured questionnaire was completed for each woman including age, weight, history of previous disease, history of previous pregnancies, and gestational age of PPROM at previous pregnancy. The patients were evaluated for bacterial vaginosisin the first visit, moreover anytime during the survey whenever the patient has been complaining of vaginosissigns, and if discovered it was treated medially. To evaluate the length of cervix and number of fetuses, Sonography was performed for all of the cases during 12-14 weeks. All of the patients were evaluated monthly during the second trimester. At the end of second trimester, they were evaluated with sonography for the volume of amniotic fluid and fetal anomalies. The fetal membrane rupture was obtained by sterile speculum and observing amniotic fluid existing from the cervix, fern test . After delivery, the questionnaire was completed by data such as the date and cause of referring to the hospital, date and time of rupture of membranes, gestational age, neonate's sex, birth-weight, and five minute Apgar score [7] (The **Apgar score** is a simple assessment of how a baby is doing at birth, which helps determine whether your newborn is ready to meet the world without additional medical assistance. Your practitioner will do this quick evaluation one minute and five minutes after your baby is born.) Data was analyzed by SPSS software (version 18). For quantitative variables, T test, and variance analysis were used if the variables were parametric. Chi-square test was used for qualitative variables. $P \leq 0.05$ was considered statistically significant.

IV. Results and Discussion

The following Figure 1.1 shows the key factors between case and control groups: There was no significant difference between case and control groups in basic interventional factors.

Figure 1.1: Key factors between case and control groups



(P>.05)

PPROM occurred in 44.7% of controls and 31.8% of cases. PROM occurred in 34.1% of controls and 18.8% of cases. Rupture of membranes was significantly decreased in the case group in the shape of PPROM, PROM and during term labor. Mean latency period was significantly (P = 0.002) higher in case group.

In the case group, 84 patients (49.4%) had normal Rupture of membrane during term delivery and mean birth weight 2840 ± 382. In the control group, 36 patients (21.2%) had normal Rupture of membrane during term delivery and mean birth weight 2630 ± 529. It was compared neonatal outcomes between case and control groups in specific patient who were involved PPROM or PROM. The mean birth-weight of women with PROM was significantly higher in the case group compared to the control (P = 0.002). The mean neonatal Apgar score in patients with PROM was 8.4 ± 0.7 in the case group and 7.83 ± 0.7 in the control group (P = 0.03). The mean gestational age at delivery was 37.1 ± 1.9 weeks in case group and 35.9 ± 2.8 Weeks in control group (P = 0.02). All the mentioned differences were statistically significant. The following table 1.1 shows that both groups were statistically different in the view of gestational age, birth-weight, and neonatal Apgar score.

Table 1.1: Outcomes of Pregnancy and Neonatal period between Case and Control Groups

Outcome	**Case Group**	**Control Group**
	n=100	n=100
Pregnancy, No. (%)		
PPROM	54 (31.8%)	76 (44.7%)
PROM	32 (18.8%)	58 (34.1%)
Normal [a]	84 (49.4%)	36 (21.2%)
Neonatal, Mean ± SD		
Mean gestational age at delivery (week)	37.1 ± 1.9	35.9 ± 2.8
Mean birth weight, gram	2840 ± 382	2630 ± 529
Neonatal Apgar score	8.4 ± 0.7	7.83 ± 0.7

a. Rupture of membrane during term delivery (P<.05)

PPROM has been known as the main cause of preterm delivery and associated with increased rates of neonatal and maternal morbidity and mortality.[8] Although it has different causes, collagen metabolism is considered as the main factor in premature rupture of membranes. Iron, Folic acid, Vitamin B Complex and Vitamin C usage during pregnancy can modulate the collagen metabolism and cause the strength of amniochorion membranes. There are many factors that affect the Preterm premature rupture of membranes (PPROM) during pregnancy. The results of this study showed that Iron, Folic acid, Vitamin B Complex vitamin C usage incase group significantly increased the gestational age at delivery, neonatal Apgar score, birth-weight, and latency period. He nant women after 20th weeks of gestation can significantly decrease the incidence of PROM and PPROM. Vitamin C, iron folic acid and vitamin B complex is an essential nutrient, involved in several biochemical functions. It is an antioxidant that blocks the damaging effects of oxidative stress in vitro.[9] Therefore, It can prevent premature rupture of membranes through its role as an antioxidant or in collagen synthesis and maintenance.[10] The present study had some limitations, we aimed to study the independent effect of Iron, Folic acid, Vitamin B Complex, but because the serum level was not assayed, isolation of the effect of a multiple nutrient is difficult. We propose a relationship between Iron, Folic acid, Vitamin B Complex intake and an increased risk of preterm premature rupture of membranes effective supplement is recommended to be administered for pregnant women with the history of PPROM during pregnancy to prevent PPROM. Nevertheless,

further studies with larger sample size and fewer limitations are needed to best clarify the role of Iron, Folic acid, Vitamin B Complex and Vitamin C in prevention of PPROM especially in women with other risk factors of PPROM.

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Reference

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