

Estimation the Antibiotics Activity Against Vaginal Pathogenic Microorganisms in Pregnant Ladies with Early Rupture Membrane and their Fetal Outcome

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Abstract

Background: The Preterm Labor: is the main reason of the (80%) from the neonatal intrapartem, postpartum morbidity and mortality. Recently, vaginal infections have been related to high risks of PPRM and PROM. However, preterm labor and subsequent neonatal bad outcome can be avoid through several protective actions. **Methods:** This study was prepared through the period from January to December 2018 at Babylon Province, were for estimate the effect of vaginal infections in patients pregnant women with premature rupture membrane, the samples were 100 pregnant women, 50 were vaginal infected (as patients) and 50 were no(as controls). **Results.** Shows significant increasing of the fetal weight, while significant decreasing of the Maternal age and duration time in the patients, also elevation in the percentages of C/S and PROM in patients when comparing all these with controls. The pathogenic microorganisms; were CONS (*coagulase negative staphylococcus auerus*) are major insulated organism followed by *Candida*, and *Bacteriod* spp., and to less extent were *Staph.*, *Proteus* and *Bacteriod*. The Cifixum, Ampicillin, Clotrimazol and Metronid were appropriate antibiotics used for treatment of the vaginal infections.

Keywords: *Premature Rupture Membranes (PROM), Preterm Premature Rupture Membranes (PPROM), F.Outcome, Antibiotics and Pathogenic Microorganisms.*

Introduction

Preterm delivery is the reason of (80%) from illness and death of the neonates, this occur earlier to 37 weeks of gestation, the premature rupture membrane is the natural rupture membrane and happen after 37 weeks from gestation before active labor, the preterm prelabour rupture membrane is the sobontaneous split of the membrane and take place between (28 to 37) weeks from gestation without active labor ⁽¹⁾. Time from premature rupture membrane to usual active labor proposes occur within (24) hours of membranes rupture and (65%) of pregnant women go into usual active labor, in addition, the rise of the pathogenic microorganisms along the vagina will eventually infect the amniotic sac and fluid and this leads to the rupture of the sac and premature labor ⁽²⁾.

The genital infections and inflammations among the pregnant ladies lead to membranes rupture, the maximum serious consequence of the preterm, membranes rupture,

preterm premature and rupture of membranes is frequently related with the infections of the maternal and the results that assessed showed the (12%) from perinatal deaths are directly or indirectly related to PROM, however, the all reasons of PPRM and PROM are not recognized, but a variety of conditions have been joined to vaginal infections, and the vaginal infections within ladies in age of reproduction were connected with amplified dangers to premature rupture of membranes⁽²⁻⁶⁾.

The microbial toxins are produced after connection of pathogenic microorganism to specific receptors on the membrane and this lead to change in tensile power for amniotic membranes and it result inflammations then PPRM formation ⁽⁷⁾. These lead to increase metalloproteinase production, which responsible for collagen degradation and causes rupture of the membrane ⁽⁷⁻⁸⁾. The fact that collagen is the main component membrane which maintain the tensile power for amniotic membranes. Though, infection formed by going up pathogenic microorganisms may happen

owing to PPRM [9-10]. The microorganisms which were generally existing in the flora of vaginal, comprising group *E. coli*, *Staph. aureus* and *B. streptococci* organisms and others which lead to bacterial vaginosis, secrete proteases & damage collagen then the amniotic membranes resulting in PROM⁽¹¹⁻¹²⁾. Intrauterine infection had proved for up to (65%) from patients⁽⁹⁻¹⁰⁾.

Additional modern information advocate several attack amniotic sac from the bloodstream after dissemination from distant places, e.g. from the gastrointestinal tract⁽¹³⁾. The single greatest threat to infant with preterm delivery, PPRM and PROM is respiratory distress syndrome (RDS). Prematurity is concomitant with approximately 60% of perinatal mortality⁽¹⁴⁾. There is increased incidence of perinatal mortality which may be owing to RDS, sepsis and asphyxia. Other reasons of death were cord accidents, intracranial hemorrhage and necrotizing enterocolitis. Incompetent blood brain barrier creates them more predisposed to brain damage. Since preventive methods can prevent the above phenomena, taking these facts into our attention.

However, several species of bacteria colonize both reproductive and gastrointestinal tracts, and have ability to colonize of the vagina and cause infections⁽¹⁵⁾. There are several types of antibiotics which include Ciprofloxacin, Norfloxacin, Gentamycin, Ampicillin, Cotrimoxazole, Amoxicillin, Tetracyclin, Erythromycin and Clindamycin, these antibiotics have different mode of activity against vaginal infected bacteria and these bacteria include *E. coli*, *S. aureus*, *Pseudomonas*, *Enterobacter*, *Klebsiella*, *Proteus* and *Group B streptococci*⁽¹⁶⁾. Many antimicrobials have been used against pathogenic bacterial vaginosis, such as Metronidazole types and/or Clindamycin⁽¹⁷⁾.

Materials and Method

A. The Patients:

The 100 pregnant women have been collected through the period from Jan/2018 to Sep/2018 at Public Teaching Babylon Hospital of Maternity and Children Babylon Province. Were 50 with vaginal infection (as patients) and 50 were no (as controls).

B. Identification of the pathogenic Microorganisms:

The swabs of vagina have been taken from control

and patients groups, then send to the microbial unit for identification of the pathogenic microorganism. This were involved growing of swabs microorganisms on several type of the selective and differential media, as well as through use of several biochemical tests.

C. Detection of the antibiotics susceptibility:

Detection antibiotics activity against pathogenic microorganisms which were isolated from vaginal swabs were carry out on the Moller Hinton Agar medium through the use of several type of the antibiotics. This method involved incubated of the pathogenic microorganisms which were isolated from vaginal swabs with antibiotics discs on this medium and then measure the inhibition zone after 24 h.

D. Statistical analysis:

The results of this study were analyzed through the use of the SPSS version 20 program. This used for calculated the Mean, Standard Error, Standard Deviation and determine the least significant difference (LSD) between the study groups.

Results

Table (1) shows a significant elevation of the fetal weight in the patients women when comparing with the control ladies, whereas significant decreasing of the Maternal age and duration time in the patients ladies when comparing with the control women. Table (2) shows an increasing in the numbers of F. outcome (normal) at all three time categories in the control women. also shows an elevation in the numbers of F. outcome (RDS) at time category (0-8) hour as well as F. outcome (Sepsis) at time categories (9-17) and (18-26) hour in the patients women. Table (3) shows a number of the pathogenic microorganism isolates were identified in the infected vagina of the patients group, as well as appeared the used antibiotics types have activity with different modes against these the pathogenic microorganism.

Figure (1) shows an elevation in the percentages of C/S and PROM in patients when which comparing with control. Figure (2) shows a percent of the pathogenic microorganism isolates were identified in the infected vagina of the patients group, the largest number and percent were of *NCOS* equal to (85) and (34%) respectively, while the smallest number and percent were equal to (3) and (2%) respectively, of *Staph.*, *Proteus* and *Bacteriod*, in summation of the all disease

cases. And figure (3) shows the used antibiotics types have activity with different modes of action against pathogenic microorganism.

Table:1. Significant differences and comparison between Fetal Wt., M. age., G A and Duration time of the Patients and Controls Women

Case Study	Study Group	Mean	Standard Deviation	Standard Error	Mean Differences	LSD
Fetal Wt. (gm.)	Patients	2214.000	796.807	112.685	263.000*	0.001
	Control	2477.000	829.199	117.266		
M. age (years)	Patients	26.300	4.682	0.662	3.640*	0.001
	Control	29.940	4.752	0.672		
G A (wks)	Patients	33.160	4.127	0.583	1.700	0.983
	Control	34.860	3.692	0.522		
Duration (hrs.)	Patients	8.120	7.397	1.046	5.740*	0.001
	Control	13.860	4.993	0.706		

*Significant differences according to LSD system at P-Value equal to 0.05

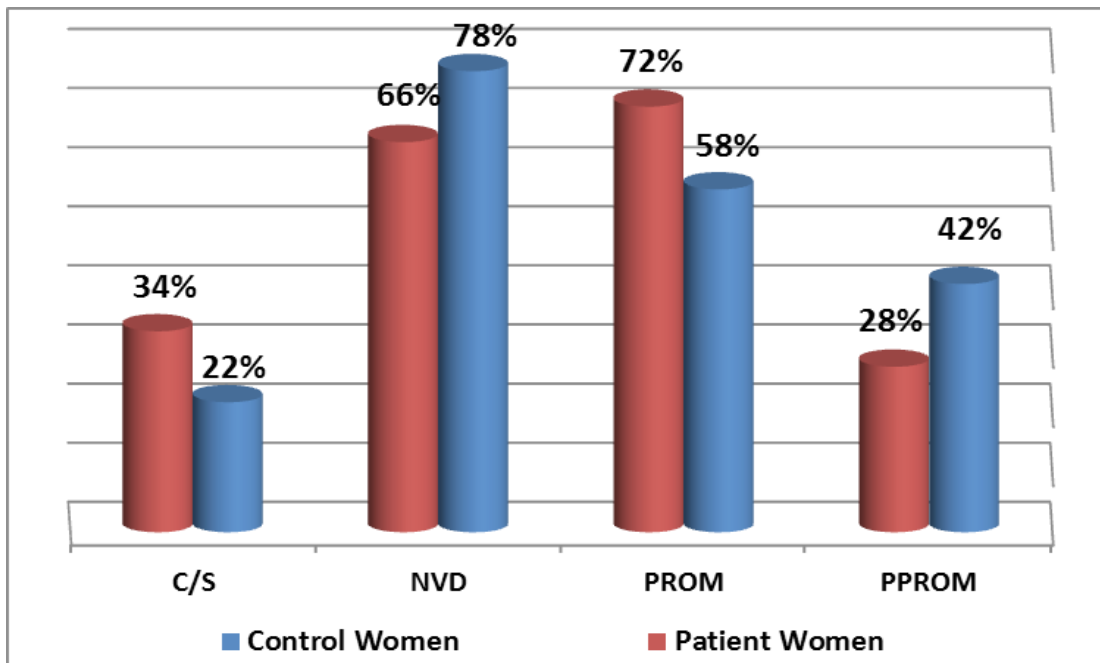


Figure:1. Percentage of the C/S, NVD, PROM and PPROM in Patients Women as well as Normal Women.

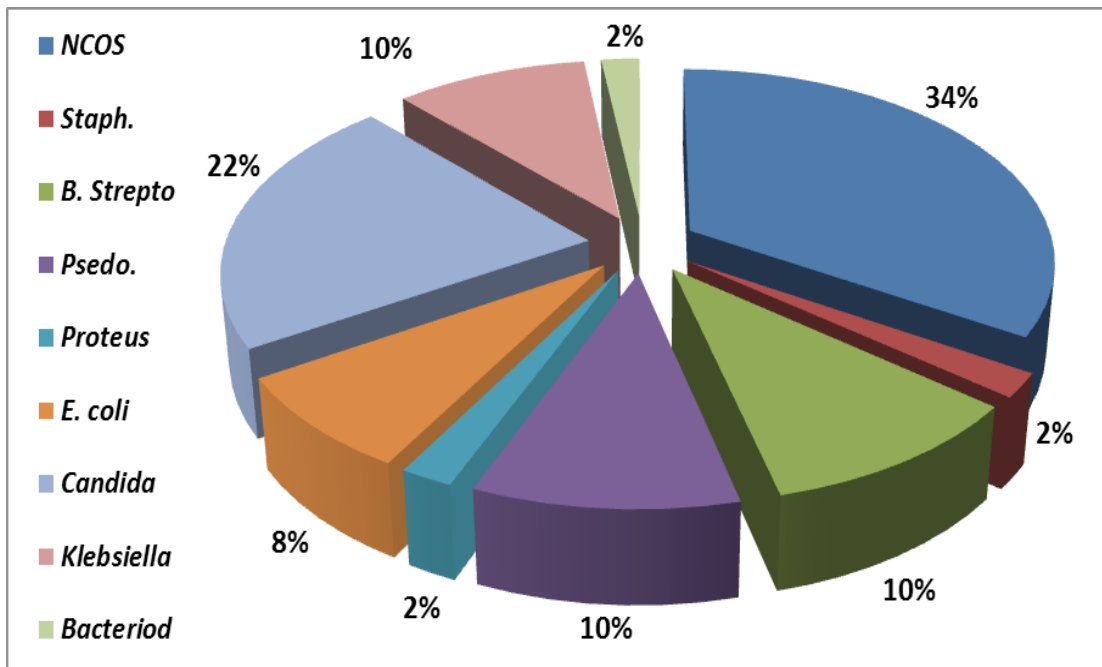


Figure: 2. Percentage of the microorganism types associated with the patients women. Number of Sensitive Microorganisms

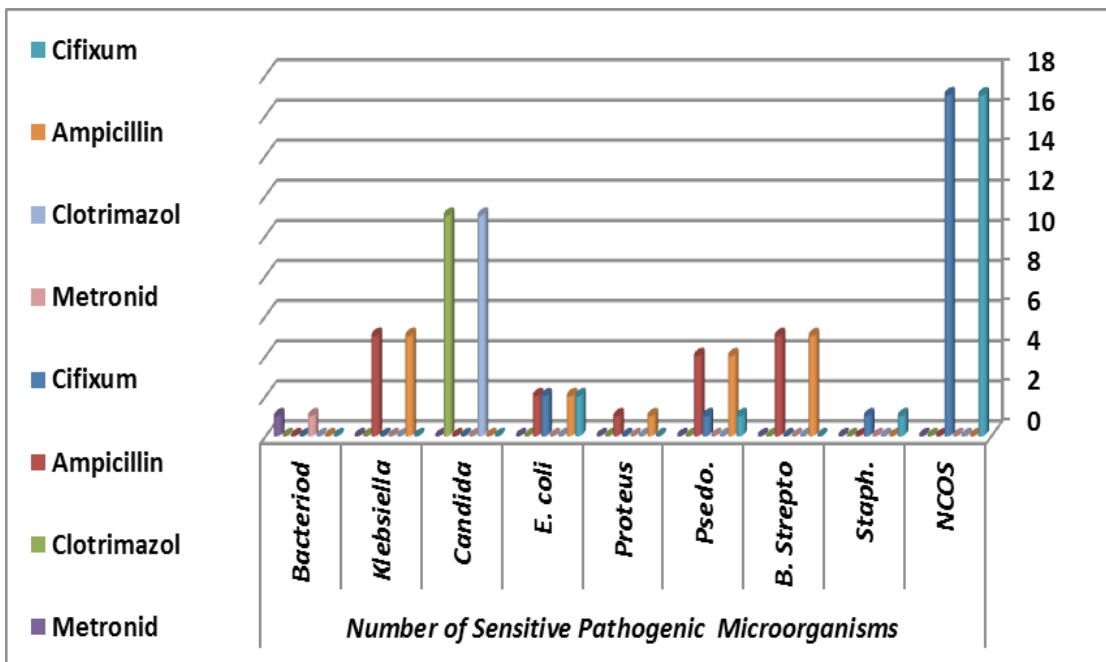


Figure: 3. Number of sensitive Pathogenic Microorganisms of the patients women.

Discussion

In this study we performed vaginal swabs of the pregnant ladies with PPROM and PROM then send to the microbiological unit lab for detection of the vaginal pathogenic microorganisms and their antibiotic sensitivity were assessed. Found the more prevalence pathogenic microorganisms were associated with virginal infection are CONS then candida and more

less prevalence pathogenic microorganisms are *Staph.*, *Proteus* and *Bacteriod*. In addition, the neonatal outcome were identified. There is good connection between micro flora of the lower genital tract and organism developed in liquor or blood of neonates with early onset sepsis. In reviews study of the McDonald *et al* ⁽¹⁸⁾ and Das *et al* ⁽¹⁹⁾, who showed that the infection was three times more common in pregnant women patients with rupture of membranes before 37 weeks of gestation than when fetal

membranes ruptured at term. In our study early rupture membrane before labor higher in patient term group (72%) while lesser in patient preterm group (58%). The (60%) of the study group had high vaginal infection in preterm pregnant while (72%) of the study group had high vaginal infection in term pregnant that may explain the higher percentage in PROM group. The study was done by Sharma who demonstrated the *E. coli* bacteria were the most commonest pathogenic microorganism isolated (20). And the studies of the Das *et al* (19), (44%), Raunt *et al* (21). Whereas the study of the Hussein who found the *Proteus* spp. and *Enterobacter* spp. were more causes of the UTI Infection (22). In our study the CONS which the most commonest bacteria were isolated with the number and percent of the isolates were 17 (34%) respectively, and second most common microorganism isolated was *Candida albicans* with the number and percent of the isolates were 11 (22%) respectively. In a study done by Lanier *et al*, the incidence of chorioamnionitis after PROM is 20% (23).

In the present study there was no case of clinical chorioamnionitis because we gave short trial for labor for pregnant with rupture membrane to prevent such complication so take rapid decision of interventions i.e all the patients in the study were given prophylactic antibiotics and decision for termination of pregnancy whether by C/S or vaginal deliveries was taken rapidly before such complication developed were i.e. within 24 hrs from the onset of PROM, PPRM). A report done by Swati, who observed that neonatal sepsis was present in 25% of the cases (24).

Conclusions

The fetal weight, maternal age and duration time were more in non vaginal infected pregnant women than vaginal infected pregnant women. C/S and PROM were more in vaginal infected pregnant women than non vaginal infected pregnant women, whereas the NVD and PPRM were more in non vaginal infected pregnant women than vaginal infected pregnant women. The NCOS and *Candida* were more pathogenic microorganisms associated with the vaginal infections in pregnant women. The Cefixim, Ampicillin, Clotrimazol and Metronid were appropriate antibiotics used for treatment of the vaginal infections, in addition to the ciprofloxacin, gentamicin, chloramphenicol group, taxim and gentamicin but we don't depend on these antibiotics because them causes of the teratogenicity through pregnancy period.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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