Vaginal Microbiota in Preterm Labour with Intact Membranes

Thesis
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LIST OF ABBREVIATIONS

ACC	Amsel's composite criteria
AV	Aerobic vaginitis
AVF	Abnormal vaginal flora
BV	Bacterial vaginosis
C trachomatis	Chlamydia trachomatis
C. perfrengiens	Clostridium perfrengiens
C. sporogenes	Clostridium sporogenes
CIN	Cervical intraepithelial neoplasia
CRH	corticotropin- releasing hormone
E. coli	Escherichia coli a
G V	Gardnella Vaginalis
GBS	Group B Streptococcus
gest age	gestational age
GPAC	Gram-positive anaerobic cocci
HIE	Hypoxic-ischemic encephalopathy
HPF	high-power field
HUAM	Home uterine activity monitoring
IQR	Interquartile range
IVF	In vitro fertilization
LBG	Lactobacillary Grade
LMP	Last menstrual period
MAFP	Maternal alpha fetoprotein
MH	Mycoplasma hominis
N. gonorrhea	Nisseria gonorrhea

N. meningitis	Nisseria meningitis
NBM	Nugent's Gram stain evaluation of bacterial morphotypes
NSAID	nonsteroidal anti-inflammatory drug.
17 OHP-C	17 a-hydroxy progesterone Caproate
P4	Endogenous progesterone
PCR	Polymerase chain reaction
PDA	patent ductus arteriosus
pH	Power of hydrogen
PIGFBP-1	Phosphorylated insulin like growth factor binding protein-1
PROM	Prelabor Rupture Of Membrane
PTB	Preterm Birth
PTL	Pre Term Labor
RDS	Respiratory distress syndrome
ROP	Retinopathy of prematurity
S. aureus	Staphylococcus aureus
SD	Standard deviation
spp.	species
TSST-1	Toxic-shock syndrome toxin-1
UU	Ureaplasma urealyticum
VC	Vaginal Candidiasis

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Introduction

Several hormonal changes are produced during pregnancy that can increasingly predispose to infections of the lower genital tract ***(Yadkin, 2005).***

These infections are associated with a great number of gynecologic and obstetric complications, such as preterm birth, premature rupture of the membranes, chorioamnionitis, endometritis, postpartum infections, inflammatory pelvic disease, intrauterine growth retardation, and low birth weight ***(De Seta et al., 2005).***

Preterm labor (PTL) is defined as contractions that cause cervical changes before 37 weeks of gestation ***(Cootauco and Althaus, 2007).***

More than 12% of infants born in the USA are preterm ***(Martin et al., 2010).***

To date, **causes of prematurity** can be found in less than one half of all cases ***(Mc Gregory and French, 2000).***

The search for causes of preterm birth has had limited success, with no strong, modifiable determinants found thus far ***(Behrman et al., 2007).***

There are a number of powerful predictors of preterm birth, including multifetal gestation, prior preterm birth, African-American ethnicity, mid-pregnancy fetal fibronectin, and short cervical length ***(Behrman et al., 2007).***

Smoking, low prepregnancy weight, and inadequate gestational weight gain are the only established modifiable predictors, each associated with a modestly increased risk ***(Berkowitz et al., 2010).***

The failure to identify individually strong, modifiable causes of preterm birth is not due to insufficient research, given numerous studies focused on psychosocial stress ***(Behrman et al., 2007).***

PTL (preterm labor) is the major cause of perinatal and neonatal mortality and morbidity in the developed world ***(Fellman et al., 2009).***

In addition, a growing body of evidence suggests that maternal genital tract infection is associated with preterm labor. Such evidence is based

On studies showing recovery of organisms from the amniotic fluid of women in preterm labor ***(Romero et al., 2002), histological*** evidence of choir ammonites.

In normal conditions, vaginal microflora comprises lactobacilli that exert a crucial role in maintaining the natural

healthy balance of the vaginal flora and in protecting the women from genital infections. Through the production of lactic acid, lactobacilli lower vaginal PH and help prevent the development of potentially pathogenic microorganisms ***(Witkin et al., 2007).***

During pregnancy, normal vaginal microbiota, which consists primarily of lactobacilli, is substituted by anaerobic bacteria such as *Gardnerella vaginalis* and *Mycoplasma homini*, resulting in a significant reduction in lactobacilli and increased pH (greater than 4.5) ***(Donders, 2010).***

Reported studies in general have focused on a single organism without simultaneously investigating other organisms present, or interactions between them. In addition, many of these studies have not taken account of other confounding clinical, demographic and social variables that may predispose to preterm labor.

For that reason, a comprehensive prospective study is needed to investigate all possible associations between vaginal carriage of different organisms and preterm labor.

Aim of the Work

The aim of this study is to study the vaginal microbiota in women with preterm labor with intact membranes and determine, whether, the presence of specific vaginal organism is significantly associated with onset of preterm labor.

THE VAGINA

The vagina is a fibromuscular canal that extends from the vulva to the uterus ***(Cunningham et al., 1994).***

The vaginal walls consist of a mucosal layer lined by stratified squamous epithelium, a layer of smooth muscle and an outer adventitial layer. In the relaxed state, the vaginal wall collapses to obliterate the lumen and the vaginal epithelium is thrown up into folds ***(Burkitt et al., 1993).***

Vaginal secretions contain many things, including sweat, sebum, and secretions from Bartholin's and Skene's glands at the vulva, endometrial, and oviductal fluids, cervical mucus, exfoliated cells, and secretions of the vaginal walls themselves, which increase with sexual arousal. A normal physiological discharge is a white or clear, non-offensive discharge that varies with the menstrual cycle ***(Spence and Melville, 2007).***

Natural defenses of the vagina

Anatomically, the closure of the anterior and posterior vaginal walls by apposition prevents the ascent of infection and allows the formation of a thin film of acidic vaginal secretions, which is bactericidal. The stratified squamous epithelium lining the vaginal wall is unbroken by glands and has no crypts