



KASR ALAINY

# **Correlation between Increased Vaginal pH and Abnormalities in the Vaginal Flora in Relation to Cervical Length and their Role in the Prediction of Preterm Birth**

## **Thesis**

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Obstetrics & Gynecology

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## Abstract

Preterm birth continues to be a major challenge in obstetrics. One of the most important avoidable causes of prematurity is ascending genital infection. Regular screening for signs of such a disturbance using vaginal pH-measurements makes possible the detection of an "early marker" to prevent prematurity in an effective and inexpensive way. Abnormal vaginal flora (AVF), bacterial vaginosis & aerobic vaginitis (AV) are associated with preterm birth. Abnormal vaginal flora in the first trimester may be a risk factor for shortening cervix length at second and third trimester and may predict preterm delivery.

**Keywords:** Preterm birth, Vaginal pH, Abnormal vaginal flora, Bacterial vaginosis, Aerobic vaginitis, Cervical length.

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## List of Abbreviations

|                         |                                             |
|-------------------------|---------------------------------------------|
| <b>AFP</b>              | Alpha fetoprotein                           |
| <b>AV</b>               | Aerobic vaginitis                           |
| <b>AVF</b>              | Abnormal vaginal flora                      |
| <b>BV</b>               | Bacterial vaginosis                         |
| <b>CL</b>               | Cervical length                             |
| <b>COX</b>              | Cyclo-oxygenase                             |
| <b>E<sub>3</sub></b>    | Estriol                                     |
| <b>EPTB</b>             | Early preterm birth                         |
| <b>FFN</b>              | Fetal fibronectin                           |
| <b>G.vaginalis</b>      | Gardnerella vaginalis                       |
| <b>hCG</b>              | Human chorionic gonadotrophin               |
| <b>ICAM-1</b>           | Intra-cellular adhesion molecule 1          |
| <b>IGFBPs</b>           | Insulin-like growth factor binding proteins |
| <b><i>M.hominis</i></b> | <i>Mycoplasma hominis</i>                   |
| <b>MoM</b>              | Multiple of median                          |
| <b>NPV</b>              | Negative predictive value                   |
| <b>OR</b>               | Odds ratio                                  |
| <b>PPROM</b>            | Preterm premature rupture of membranes      |
| <b>PPV</b>              | Positive predictive value                   |
| <b>PROM</b>             | Premature rupture of membranes              |
| <b>PTB</b>              | Preterm birth                               |

|                       |                                                 |
|-----------------------|-------------------------------------------------|
| <b>PTD</b>            | Preterm delivery                                |
| <b>SPTB</b>           | Spontaneous preterm birth                       |
| <b><i>Staph.</i></b>  | <i>Staphylococci</i>                            |
| <b><i>Strept.</i></b> | <i>Streptococci</i>                             |
| <b>TVU CL</b>         | Transvaginal ultrasonography<br>cervical length |
| <b>TVUSS</b>          | Transvaginal ultrasonography                    |
| <b>US</b>             | Ultrasound                                      |

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## Introduction

Preterm birth continues to be a major challenge in obstetrics, and there are few methods available to reliably predict true preterm labor in women who present with symptoms of labor (*Hill et al, 2008*).

An estimated 50% of spontaneous preterm births are associated with ascending genital tract infection, and those occurring before 30 weeks' gestation are even more likely to be infection-related. Because the earliest preterm births account for a disproportionate percentage of neonatal morbidity, infection associated preterm birth represents an attractive area for intervention (*Klein and Gibbs, 2005*).

Some US studies demonstrated that an elevated vaginal pH ( $>4.5$  or  $\geq 5.0$ ) by itself, or combined with an elevated Nugent Gram stain score, or with elevated neutrophils was associated with preterm delivery and LBW (*Simhan et al., 2003; Causi et al., 2005*).

Normal vaginal microflora were associated with a 4-fold decreased risk of spontaneous preterm birth., while women who showed at least once bacterial vaginosis-like microflora, atypical gram-positive rods, or pronounced vaginal leukocytosis of unknown cause had an adjusted odds ratio of 5.2 for spontaneous preterm birth (*Verstraelen et al., 2007*).