


**Functional Connectedness
of Lower/Upper
Reproductive Tract**

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**Pathogenesis “ascending
intrauterine infection”***

“Vaginal microorganisms appear to ascend first into the choriodecidual space, then into the amnion, then the umbilical cord, and amniotic fluid, and ultimately the fetus”

Errol R Norwitz et al
Reproduct Sci
2011;18:713-22

* “poor correlation clinical and histological chorioamnionitis.” “IAI occurs early in pregnancy” “causes uncertainty”




(Micro) Functional Uterus Anatomy
RHF Hunter Bio Rev 2011;87:244-55

(f) Endocrine, Paracrine controls
Uterus layers:

- Endometrium
- Transition (TZ)
- Inner 1/3 myometrium
- Mid 1/3 myometrium
- Outer 1/3 myometrium

Myometrial gap junction (f) hormones
Autonomic nervous input
“Oviduct fluids”
Counter-current circulation (steroids PG)



Cervicovaginal Small Molecules of Interest in Novel Biomarkers
ER Norwitz Repro Sci 2011;18:713-37

- ▶ Bacterial products, LPS, TCA, protein, retinol, PG's, Proteases (NGAL)
- ▶ Arachadonic acid
- ▶ Fatty acids, proteases, mucin
- ▶ Matrix metalloproteinases
- ▶ Specific cell surface receptors
- ▶ Cell signals (BcLA, caspase 3)
- ▶ Cytokines
- ▶ Microorganisms NOT mentioned

Microbicide Excipients Can Greatly Increase Susceptibility to Infections
TR Muench, RJ Mumper BMC Inf Dis 2010;10:331

- ▶ Vaginal microbicides HIV, STIs
- ▶ Results: contents of vaginal microbicides
 ↑ rates of infection

Study

- ▶ Patients:
 - ▶ 1) 24 y/o at day 14 of cycle with U/S Hsg
 - ▶ 2) 26 y/o G1 at 38 wks gestation with intact cervical plug
- ▶ Materials: 5 cc Albuminex™ ultrasound contrast media placed in upper vagina
- ▶ U/S observation at 1 hour

Results:

Non-Pregnant:

1. Vaginal substances transported within 1 hour @ follicular phase
2. Cervix → Fundal

Term Pregnancy:

1. Manipulation cervix → ↑↑↑ Intrauterine transport to decidua, fetal membranes

Conclusions:

1. Intact Cervical (mucous) Barriers circumvented:
 - non-pregnant @ midcycle &
 - pregnant @ term
2. Prompt translocation vaginal material by cervical touch

Active Uterine Transport

Observations:

- a) correlate with prior studies
- b) transport through apparent “mucous plug” and local host defenses
- c) transport occurs in < 1 hour at mid-cycle
- d) ↑↑↑ with cervical stimulation similar rabbits and horses

Active Uterine Transport

Clinical Suggestions:

Pre-Pregnant

- a) Screen, Treat, TOC, abnormal flora
- b) HPV vaccination
- c) Promptly evaluate symptoms
- d) Monitor healthy vaginal microecology i.e., self monitoring pH
- e) PRO/PREBIOTICS
- f) Behaviors
- g) Avoid douching (use wipes)
- h) Reduce sex exposure
- i) A) patients/partner
- j) Condom use
- k) Hormonal contraception

Pregnant

- a) Screen; treat, TOC, Early pregnancy
- b) Ensure healthy vaginal microecology, i.e., self monitoring pH
- c) Behaviors
 1. Avoid douching (use wipes)
 2. Reduce sex exposure
 3. A) patients/partner
 4. Condom use

ACOG Well woman gynecology #534
Obstet Gynecol 2012;Aug: 421

Future Research

1. Repeat to reconfirm
2. Probiotic/Prebiotic use

Suggestions for Clinical Practice

1. Virulent microbes at cervix/vagina “screen and treat
2. “Reduce EXPOSURE to pathogenic microorganisms
3. “Screen and Treat” and “TOC”
 - a. CT
 - b. GC
 - c. Vaginitis
 - d. HIV

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