



Transmissive Infections (TI) and Reproductive Technologies

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Transmission Infections (TI)

- HIV

- HCV

Infertility

- ☞ TI positive and TI negative workup is no different
- ☞ One year of unprotected intercourse
- ☞ History/sexual practices
- ☞ Sperm evaluation
- ☞ Urologic evaluation
- ☞ GYN evaluation
- ☞ Appropriate treatment

Risk of Transmission

- ✓ Unprotected vaginal intercourse
 - Male to female = 3% to 10% per contact
 - Female to male = 10% to 17% less efficient

Risk of Transmission

- ✓ In unprotected vaginal intercourse leading to pregnancy the risks are twofold:
 - Partner's risk of infection
 - Baby's risk of infection

TI in Body Fluids

- ✓ Blood
- ✓ Semen
- ✓ Cervical secretions
- ✓ Breast milk
- ✓ Spinal fluid

HIV in Semen

- ✓ Higher in acute HIV infection in men
- ✓ Correlation between viral levels of HIV in blood and semen
- ✓ Men hyperinfectious before symptoms of HIV infection occur (lasts 6 weeks)
- ✓ Could infect 7 to 24% of partners during first 2 months of infection
- ✓ STD would increase this rate (in either partner)

JID 2004; 189:1785-1792

HIV in Cervical Secretions

- Varies in menstrual cycle (due to hormone variation)
- Highest just before menses start
- Risk of transmission riskiest as menses approach
- The Lowest level at mid-cycle
- Explains increase of HIV in cervical secretions in women on oral contraceptives
- No increase of cervical shedding in menses
- Less variation in serum than genital secretions
- Less virus in vaginal than cervical in secretions

Heterosexual Transmission Risks Increase With

- ✔ Genital ulcer or STD
- ✔ Cervical ectopy
- ✔ Sex during menses
- ✔ Bleeding during intercourse
- ✔ Receptive anal intercourse
- ✔ Partner with high viral load

Risk of Vertical-Transmission

- ☞ Mother
 - cigarette smoking
 - older maternal age
 - high viral load
 - low CD4
 - vaginal delivery
 - prolonged rupture of membranes >4hrs
 - acute HIV infection
- ☞ Baby
 - prematurity
 - breastfeeding

Vertical Transmission

- In utero - <10%
- Peripartum – 40 – 70%
- Breastfeeding – 0.5% per month risk
- Most important factor is viral load

Cesarean Delivery

AZT	C/S	Transmission rate
No	No	18%
No	Yes	10.4%
Yes	No	7%
Yes	Yes	2%

International Perinatal HIV Group NEJM 1999:340-977

Negative Female Positive Male

- ☞ Timed unprotected intercourse (as above) not recommended
- ☞ Intrauterine insemination (IUI) after “sperm washing”
- ☞ Intracytoplasmic sperm injection (ICSI) one sperm-one egg with zygote implanted in uterus (aliquots tested for cell free virus) via laser manipulation

Negative Male Positive Female

- ☞ Timed unprotected intercourse (using basal body temperature monitoring)
- ☞ “Turkey baster” method self insemination
- ☞ Ovarian stimulation with artificial insemination (partner/donor)
- ☞ In vitro fertilization

Positive Male Positive Female

- Remember undetectable viral load in serum does not mean undetectable genital viral load
- It may be possible to impart resistant virus from one partner to the other

Superinfection

- ☞ Controversial
- ☞ 5 published verified cases
- ☞ Appears to occur but difficult to verify
- ☞ Usually occurs shortly after initial infection
less likely later on
- ☞ HIV positive people prefer other HIV positive people

Reproductive Decisions

- ☞ Artificial insemination
- ☞ In vitro fertilization
- ☞ Intracytoplasmic sperm injection – most expensive
- ☞ Self insemination
- ☞ Timed intercourse
- ☞ Transmission rates Mother-to-Child Transmission (MTCT) $<1\%$ in women with VL <1000 copies

Timed intercourse (U.S.-data)

- Condoms at all times
- No condom during fertile times
- 4% transmission rate (for female if male HIV+)
- Men – semen sample – count motility, progression, morphology
- Women – ultrasound during follicular phase and endocrine profile

Self insemination (U.S.-data)

- Women inseminate themselves with fresh semen using syringe (without needle) or disposable Pasteur pipette (cheap, safe)

IVF (U.S.-data)

- IVF – for infected male for uninfected female sperm processed and single sperm used to fertilize egg of HIV infected woman
- No seroconversion and no HIV+ infants
- Intracytoplasmic sperm injection

Sperm Washing

- Infected male followed by intrauterine insemination
- 29% success rate for pregnancy
- No seroconversion of females

Sperm Washing

- ☞ For use in cases where male is HIV+
- ☞ Ejaculate is processed in laboratory separating semen from sperm cells
- ☞ These cells are then reinserted into female (in vivo) or inserted into ovum (in vitro) for fertilization
- ☞ This process will reduce possibility of infecting HIV negative woman
- ☞ This process will reduce chance of re-infection of HIV positive woman with resistant viral strain
- ☞ Problems – expense, technical availability, needs cooperative couple and committed obstetrician

Patient Considerations

- ✔ Healthy
- ✔ CD4 >350
- ✔ VL <50,000
- ✔ Woman must have normal PAP and normal colposcopy
- ✔ If Hepatitis C must have normal liver enzymes and hepatology consult
- ✔ Been on HAART for 1 year
- ✔ Male semen sample
- ✔ No unprotected sex during this time

Goals of these Reproductive Options

- ☞ Achieve pregnancy
- ☞ Give woman choice regarding pregnancy
- ☞ Avoid transmission of TI to mother, father or baby

Conclusion

- With minimal risk it is possible for many TI positive persons to become the parents of TI negative babies