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ASSIGNMENT

Question

Discuss the factors facilitating the movement of sperm in the female reproductive tract

Answer

1. **Antimicrobial defenses** - The vagina is open to the exterior and therefore also open to infection, especially during sexual intercourse. Defenses such as acidic pH and immunological responses can damage sperm as well as infectious organisms.
2. **Estrogen level** - estrogen regulates fluid reabsorption in the efferent ductules of the male, It is important for the uptake of water, ions and proteins from the fluid that carries the sperm. Estrogen aids in the production of cervical mucus, cervical mucus presents a greater barrier to abnormal sperm that cannot swim properly or that present a poor hydrodynamic profile than it does to normal, vigorously motile sperm and is thus thought as one means of sperm selection.
During the follicular phase, mucus deep in the channels is different in composition and less dense than that in the central portion of the cervical canal. Bull sperm enter deep channels at the external os and travel in them all the way to the uterine cavity, thereby avoiding the more viscous mucus in the center of the cervical canal that serves to discharge uterine contents.

3. **Uterine contractions of the myometrium**- The myometrium is the middle layer of the uterine wall, consisting mainly of uterine smooth muscle cells (also called uterine myocytes) but also of supporting stromal and vascular tissue. Its main function is to induce uterine contractions. The transport of sperm is therefore aided by the contractions of the myometrium. Uterine smooth muscle contractions increase in intensity during the late follicular phase. The uterine contractions occurring in women during the pre-ovulatory period are limited to the layer of myometrium directly beneath the endometrium and the contractions occurring during menses involves all layers of the myometrium. The activity of uterine muscle may draw sperm and watery midcycle mucus from the cervix into the uterus.
4. **Uterotubal junction**- The uterotubal junction presents anatomical, physiological and/or mucous barriers to sperm passage. Within the lumen of the junction, there are large and small folds in the mucosa, this arrangement of folds is designed to entrap sperm and prevent further ascent.
5. **Consistency of Calmegin**- The role of calmegin in enabling sperm to pass through the uterotubal junction. a sperm surface protein or proteins and calmegin, is required by each sperm for it to pass through the junction
6. **Stress** - stress may cause the release of steroid hormones such as glucocorticoids, which can decrease testosterone levels as well as sperm production. Oxidative stress is another possibility and has been found to adversely impact semen and sperm quality and fertility.
7. **Sperm undergo two changes in preparation for fertilization: capacitation and hyper activation.** Capacitation involves changes in the plasma membrane, including shedding of proteins and cholesterol, that prepare sperm to undergo the acrosome reaction and fertilize oocytes and therefore loss or modification of proteins on the surface of the plasma could reduce affinity for the endosalpingeal epithelium. Hyper activation, on the other hand, is a change in flagella beating that typically involves an increase in the flagella bend amplitude. This can provide the force necessary for overcoming the attraction between sperm and epithelium.
8. **Hyper activation**- At some point in the female tract, most likely in the Fallopian tubes, sperm become hyper activated, hyper activation is required by sperm to progress towards the oocyte and penetrate its

vestments. Hyper activation enhances the ability of sperm to swim through viscoelastic substances such as mucus in the tubal lumen and the extracellular matrix of the cumulus oophorus. Hyper activation also endows sperm with greater flexibility for turning around in pockets of mucosa, hyper activation also aids sperm in penetrating the zona pellucida(The thick transparent membrane surrounding a mammalian ovum before implantation)

9. **After fertilization, any sperm remaining in the female reproductive tract may be phagocytized by isthmic epithelial cells. Or may be eliminated into the peritoneal cavity where they are phagocytized.**