Chapter 4

Physiological Aspects of Female Sexual Development

Gestation, Lactation, Menopause, and Erotic Physiology

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The scientific inquiry into human sexuality is in many ways incomplete. Political, religious, and cultural taboos contribute to the difficulties of gathering and disseminating information. Unfounded, though popular conceptions of sexuality contribute to sexual repression and oppression. The following discussion of physiological aspects of female sexual development will assist the reader to differentiate better between myth and fact when encountering information about sexuality and to reserve acceptance of data that are not fully substantiated.

Gestation

Gestation, defined in the strictest sense, refers to the development of the embryo from conception to birth. The focus of this section is on aspects of the hormonal mechanisms of pregnancy and their effect on the mother rather than on the fetus. In every culture throughout history, there have been attempts to control fertility. In today’s medically and technologically advanced societies, women can elect when and how often to become pregnant or, having conceived, whether or not to
carry the conceptus to term. The new medical technology affects both individual physiology and societal function. Legalities, customs, and religious views have not caught up with the technological changes.

If fertilization of the ovum takes place during the midpoint of the woman’s hormonal cycle, the menstrual cyclicity is interrupted. The corpus luteum remains intact, presumably under the influence of the hormone human chorionic gonadotropin (HCG), which is secreted by the developing placenta, beginning within a week of conception. Once the placenta is fully capable of secreting progesterone and estrogen itself, approximately six to eight weeks into pregnancy, the corpus luteum of the ovary begins gradually to degenerate. These three hormones, HCG, progesterone, and estrogen, dominate pregnancy. However, their precise physiological actions on the mother, on the fetus, and on the placenta are still obscure.

HCG is the hormone measured in pregnancy tests. Originally, rabbits were injected with anti-HCG and later with the urine of the presumptively pregnant woman. If the rabbit died, the woman was pregnant. Modern techniques permit a more sophisticated test that does not require the rabbit. Blood can also be tested for HCG, permitting earlier detection of pregnancy. HCG sustains the corpus luteum and also causes the endometrium to grow and store nutrients. However, uneventful continuance of pregnancy occurs in animals when the corpus luteum is removed surgically. Therefore, either a backup mechanism acts to interrupt cyclicity, or HCG activity is broader in scope than is currently known. For example, HCG may act as a stimulus on the maternal adrenocortical glands. After the fetus and placenta are sufficiently mature to continue the pregnancy without the corpus luteum, HCG continues to be secreted.

During the third trimester of pregnancy, HCG production increases until the last week. It is uncertain what role HCG decrease fulfills, but it is possible that the HCG level is linked to uterine motility and that its decrease during the last week plays a part in the onset of labor.

Progesterone is secreted in moderate amounts by the corpus luteum at the beginning of pregnancy, and it is secreted in large amounts by the placenta for use as a precursor of fetal steroids. The rate of secretion increases as much as 10-fold during pregnancy. The fetus metabolizes about 30 mg of progesterone for every 100 ml of plasma reaching it through the placenta. Progesterone inhibits proliferation of the endometrium, it is important in embryonic nutrition, and it decreases contractibility of the uterus.

In addition to inhibiting the motility of uterine muscle, progesterone relaxes other smooth muscle. Relaxation of the esophageal sphinc-