51. Hormone production by the human corpus luteum in vitro: factors modifying tissue response in a perfusion system,
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Previous studies of intact human corpora lutea in vitro showed that oestradiol production continued for about 50 h whereas progesterone production lasted for up to 5 days. In further studies slices of human corpora lutea cultured by the same method gave appreciably greater production rates of hormones. Slices from 6 glands on days 16-24 of a 28-day cycle gave average production rates of 4.4 µg progesterone/g/h and 0.2 µg oestradiol /g/h. In order to investigate changes due to different culture conditions a perfusion system was developed, similar to those used by other workers in studies of the adrenal gland and porcine corpora lutea. Freshly obtained human corpora lutea were cut by hand to give slices of 0.5-1 mm. Capsular tissue and antral clot were removed with the aid of a dissecting microscope. Perfusion of about 150 mg of tissue took place in a chamber of 2 ml volume, at 37°C. Changes in pH of perfusion fluid made no difference to hormone production rates. Addition of fetal calf serum to the basic perfusion fluid gave a 10-fold increase in progesterone production. A similar response was observed with serum from several sources. Rates of flow of perfusion fluid also had a significant effect upon hormone production rates. Careful definition of culture conditions is required if reproducible results are to be obtained in in vitro studies of the human corpus luteum.

52. Hormonal changes at female surgical castration,
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The circulating hormone changes caused by removal of functioning human ovaries were studied by sequential blood sampling in 40 pre-menopausal women undergoing surgical castration. The complicating effects of surgery and anaesthesia were examined by similar sampling in 10 pre-menopausal women undergoing pelvic surgery without castration. Blood samples were collected pre-operatively and at 1, 2, 6, 12, 24 h and then daily upto 10 days post-operatively. Short term (6 weeks) and long term (greater than 1 year) blood samples were also obtained. Each sample was analysed using precise, sensitive, specific radioimmunoassays for oestradiol (E2), oestrone (E1), oestrone sulphate (E1S), androstenedione (A), LH and FSH. After surgical castration there was a rapid fall in E2 to basal post-menopausal levels within hours. There was a gonadotrophin rise to post-menopausal levels in response to the E2 change but this rise was delayed by several days and occurred earlier with FSH than LH. E1 and E1S levels also fell post-oophorectomy but these falls were slower and less marked than with E2. A levels were unaffected by castration. The occurrence of short-term menopausal symptoms after castration was variable and no significant difference was noted in any of the hormones assayed between symptomatic and asymptomatic patients.

53. Monitoring of ovarian activity by the radioimmunological determination of estrogen glucuronides, estrone and estradiol in urine,
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Daytime, over-night and 24-h urine samples were collected over 29 cycles in 21 women and estrone (E1) estradiol (E2) and, after hydrolysis and chromatography, E1-3-glucuronide (E1-3G), estriol-3-glucuronide (E3-3G) and E3-16α-glucuronide (E3-16G) were assayed by radioimmunoassay. The day of the highest LH excretion in the urine which was followed by an increase in urinary pregnanediol-3-glucuronide and/or plasma progesterone was regarded as day 0 of the cycle. Statistical analyses of the whole material indicated that with the exception of the mean E3-3G excretion the mean output of the other estrogen metabolites in urine increased significantly from a basal level, by day -5. The mean E3-3G value first started to increase on day -3. The basal estrogen excretion could best be calculated from values over days -8 to -6 and the coefficient of variation for the mean basal values between individuals varied in 24-h urine samples between 30% (E2) and 60% (E1 and E3-16G). Within-individual variation was calculated for the mean basal values for E3-16G and was found to be only 1/3rd of that of the between individual variation. Mean E1 and E2 excretion peaked on day -1, mean E1-3G and E3-16G excretion peaked on days -1 to 0 and that of E3-3G on day 0. E1-3G was excreted in largest amounts followed by E3-3G and E3-16G. The distribution of values for all estrogen metabolites was approximately lognormal. In the region of higher values the variation was much greater. Because the estrogen glucuronides can be determined directly in diluted urine the monitoring of ovarian activity is very convenient by urinary assays. The most useful conjugate for that purpose is E1-3G which gives approximately as reliable results as the assay of E2 or E1 following hydrolysis and chromatography. However, the E1-3G method also measures some other estrogen conjugates, but this does not seem to influence its value adversely for the monitoring of ovarian activity before and during ovulation.

54. Sterility in Wobbler mice - a defect in cellular estradiol-binding activity,
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The Wobbler mouse provides a model of motor neuron disease which results from a mutant recessive autosomal gene, wr. Only animals