Abstract:

Non-invasive methods for monitoring reproductive status based on the measurement of urinary steroid conjugates were examined. Levels of urinary oestrone-3-glucuronide, oestrone-3-sulphate, oestradiol glucuronide, oestradiol sulphate and pregnanediol-3 alpha-glucuronide were determined during the ovarian cycle and pregnancy. Sequential hydrolysis showed oestradiol conjugates to be more abundant than oestrone conjugates. The levels of sulphates and glucuronides were similar in the follicular phase whereas sulphates predominated during the luteal phase and pregnancy. Although levels of oestrone-3-sulphate were two- to fourfold lower than those of oestradiol sulphate, measured after hydrolysis, the profiles throughout the cycle and pregnancy were similar. Levels of oestrone-3-sulphate, measured by direct assay, were below 1 mumol/mmol creatinine during the follicular phase, rising 3-4 days after ovulation to reach maximum values (2-8 mumol/mmol creatinine) in the mid-luteal phase. There was no consistent increase before ovulation. Levels during pregnancy rose gradually until days 70-90, after which there was no further increase (gestation length = 144 days). The pattern of pregnanediol-3 alpha-glucuronide was similar to that of oestrone-3-sulphate during the ovarian cycle but levels did not increase during pregnancy. The patterns of excretion of oestrogen and progesterone metabolites were similar to the pattern of the circulating hormones during the ovarian cycle. Circulating and urinary hormone patterns were similar for oestrogens throughout pregnancy but pregnanediol-3 alpha-glucuronide did not reflect progesterone secretion beyond day 70 of gestation.