Abs No 217

Determination of Cytosol Estrogen and Progesterone Receptors in Uterine Tissues

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Determination of steroid receptors concentration in human tissue will help us to understand the pathophysiology of hormonal response of the tissue. This understanding may improve our knowledge about the mechanism of the hormonal action and may have applications in selection and monitoring of endocrine therapy in the future.

The uterine tissue taken from operation were immediately frozen in liquid nitrogen and stored at −70°C until analysis. The cytosol was prepared from the homogenized tissue by ultra-centrifugation (120000 x g, 45 min.). The concentration of cytosol estrogen receptor (ER) and progesterone receptor (PR) were estimated by dextran-coated charcoal method with [^{3}H] estradiol and [^{3}H] promegestone (R5020) as the tracer, respectively. For the determination of non-specific binding, diethylstibestrol and cold R5020 were used for ER and PR, respectively. The results were analyzed with Scatchard plots. The addition of testosterone or cortisol into the assay mixture did not affect the binding assay of receptors. The K_d were estimated in the range of 10^{-9}, 10^{-10}M, which not only helped us understand the properties of the receptors but also was used as a quality control index. For each run, human uterine myoma and rabbit kidney were used as the positive and negative control, respectively.

Neither ER nor PR could be detected in the myometrium at the term of pregnancy. This may due to nuclear translocation caused by high hormone concentration under this physiological condition. The content of ER and PR was determined as 183 ± 118 fmol/mg prot. (mean ± S.E.) and 412 ± 94 fmol/mg prot., respectively, in the uterus of leiomyoma (n=5). Although the uterus of cervical carcinoma (n=6) contained both receptors (ER: 99 ± 69 fmol/mg prot.; PR: 65 ± 40 fmol/mg prot.), there were no receptors detected in the tumor itself (n=3). Preliminary results also indicated that uteri from ovarian and endometrial carcinoma contained ER (16-198 fmole/mg prot.) and PR (101–849 fmol/mg prot.). In addition the ER and PR could be demonstrated in the endometria of endometrial carcinoma and hyperplasia. The possibility of using ER and PR as an index to select endocrine therapy for endometrial cancer and to rule out the direct effect of estrogen and progesterone on cervical cancer tissue are interesting and need further investigation.

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(21)