The oestrogen receptor (ER) in normal and abnormal uterine tissue

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Abstract

Glandular epithelium and stroma of the endometrium show typical behavioural patterns in the expression of oestrogen receptors (ERs) due to both endogenous and exogenous hormonal influence. Thus, the ER is increasingly expelled under the influence of oestrogen during the first half of the cycle. Under the influence of progesterone, the ER disappears during the luteal phase and is not even detectable after day 21. During menopause, the atrophic endometrium typically shows very little, if any, ER expression. In cases of oestrogen-induced hyperplasias, the receptor can again be demonstrated. The ER only disappears when nuclear irregularities occur in cases of adenomatous hyperplasia. In cases of invasive carcinoma, a heterogenous picture is seen which closely correlates with the degree of differentiation.

Keywords: Oestrogen receptor; Endometrium

1. Introduction

With the help of conventional histological diagnostics, it is presently possible to accurately describe changes of the endometrium during different phases of a woman's life. The use of monoclonal antibodies (MAbs) against the ER allows an even more subtle insight into the function of the endometrium [1,3].

In order to evaluate this aspect more closely, the endometrium of pre- and postmenopausal women was examined immunhistochemically in 144 hysterectomy samples [2].

2. The premenopausal endometrium

During the follicular phase, the endometrium continually grows under the influence of oestrogen up until mid-cycle. Immunohistochemical staining of the ERs can be demonstrated in glands as well as in stroma.

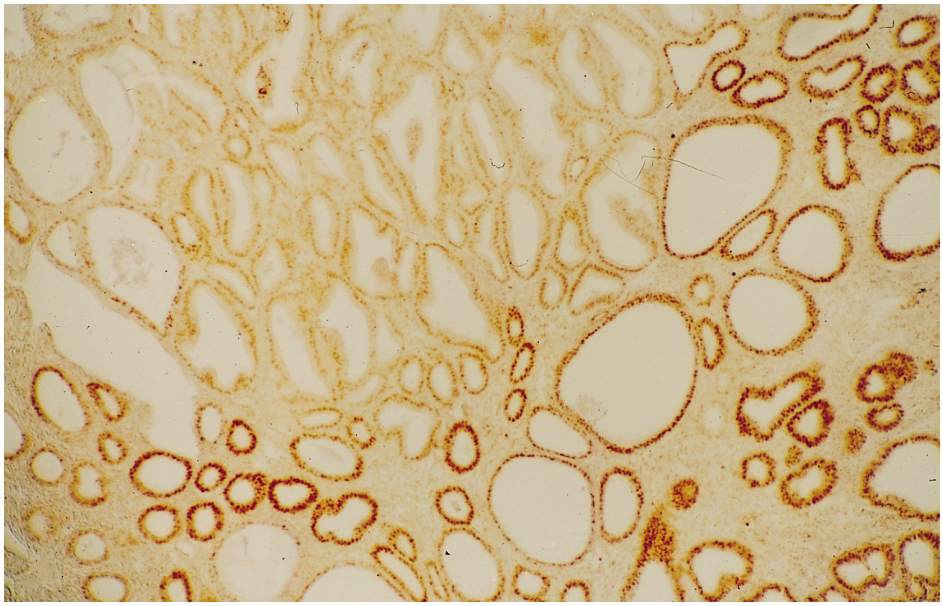

Fig. 1. Well-differentiated carcinoma resulting from hyperplasia with partial loss of oestrogen receptor (ER) expression.

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During the luteal phase, the endometrium continues to increase in thickness. The ER continues to be demonstrable, even when the pending influence of progesterone causes retronuclear brightness in endometrial glands. In the following days the increase of progesterone results in the steady decline of the ER expression. Starting at day 21, the oestrogen receptor can no longer be demonstrated.

Glandular epithelium is effected by these changes more distinctly than stroma. Nevertheless, stroma stains less strongly than the epithelia. The above changes predominantly take place in the functional endometrium. The basal zone, as well as the epithelial surface, undergo little histological change.

3. Postmenopause

The postmenopausal endometrium is characterised by atrophy. The scarce glands are either receptor-negative or display only isolated oestrogen receptor-positive cells. The same applies to the stroma.

Under the influence of oestrogen, during the climacteric either as a result of follicle persistence or exogenous hormone application, a renewed proliferation occurs up to the point of glandular-cystic hyperplasia. Glands and stroma again become ER-positive. Only the pressure-atrophic epithelia of cystically altered glands do not react.

The glandular epithelium in adenomatous hyperplasias, originating under the influence of oestrogen, also displays a high concentration of ERs. Yet, this only applies to grade 1 and grade 2 adenomatous hyperplasias.

Hyperplasias with nuclear irregularities (grade 3) do not display ERs. Evidently the cell's endeavours towards autonomy are so strong in these cases, that the receptor production becomes secondary.

Endometrial carcinoma shows different behavioural patterns depending on its genesis and histological grades (Fig. 1). Type I carcinomas, which originate in hyperplasia, generally show a receptor-rich behaviour. Type II carcinomas, which originate *de novo* and usually display a low histological grade, are receptor-poor.

4. Conclusion

The expression of oestrogen receptors in the endometrium is controlled by oestrogens and progesterones. This applies to both normal as well as pathological tissue. ER expression can completely disappear during the transition to a carcinoma. In invasive carcinoma, the ER concentration is dependent upon the histological grade.

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The oestrogen receptor (ER) in vulva, vagina and ovary

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Abstract

The oestrogen receptor (ER) has been identified in normal and neoplastic epithelia of the vulva, vagina and ovary using biochemical, immunohistochemical (IHC) and molecular techniques. Its presence has not translated into effective antineoplastic therapy for malignancies arising from these sites.

Keywords: Oestrogen receptor; Immunohistochemistry; Vulva; Vagina; Ovary

1. Introduction

While oestrogen receptor (ER) has been identified in the epithelium of the vulva, vagina and ovary by biochemical, immunohistochemical (IHC) and molecular techniques, none of the epithelial malignancies arising from these sites are routinely hormonally sensitive [1–10]. This presentation will review the ER status of normal and neoplastic epithelial tissues derived from these sites.

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