

STUDY ON ESTROGEN RECEPTORS (ER α AND ER β) IN TISSUES AROUND LEVATOR ANI MUSCLES OF FEMALE STRESS URINARY INCONTINENCE.

Hypothesis / aims of study

To study the estrogen receptor α and β (ER α and ER β) status around levator ani muscles (LAM) of patients with stress urinary incontinence (SUI) and to explore its relation with SUI.

Study design, materials and methods

The biopsy specimens of LAM were obtained from 26 subjects of SUI undergoing hysterectomy and tension-free vaginal type procedures. Twenty-one control specimens were obtained also. The histological structures around LAM were examined with routine HE staining. The ER α and ER β in pelvic floor structure were detected by immunohistochemical staining and western blotting.

Results

(1) Positive biopsy rate of tissue around of LAM in SUI group was less than that in controls, and positive biopsy rate of postmenopausal SUI group was significant less than the premenopausal (P<0.01). There was no significant difference in positive biopsy rate between premenopausal and postmenopausal control women (P>0.05). (2) Serum estradiol level of premenopausal SUI group is significantly less than the controls (p<0.05). (3) There was no ER α and ER β expression in the LAM of specimens. (4) ER α stained positively in the tissue around LAM. Positive expression rate of ER α in the tissue around LAM was lower in SUI group and postmenopausal group (p<0.05). (5) The expression of ER β in the tissue around LAM was significantly less in SUI group, compared to control groups (p<0.05). There was no significant difference in ER α expression in the tissue around LAM between premenopausal and postmenopausal control group (P>0.05). There was no significant difference in ER α expression in the tissue around LAM among the premenopausal SUI, postmenopausal SUI and control groups (P>0.05). (6) Western blotting demonstrated that ER α expressed lower than ER β in tissues around LAM. ER α and ER β expression in SUI group was lower than the control group.

Interpretation of results

(1) Our data showed that the thicknesses of pelvic muscle and contracting muscle were degraded with age. The lower biopsy rate of SUI group also indicated that SUI women had weak muscle fiber, low skeletal muscle component and connective tissue replacement of levator ani muscle.

(2) From our data, serum estradiol level was lower in postmenopausal women and premenopausal SUI women, suggested that SUI of premenopausal women must have relation with lower serum estrogen.

(3) Our data illustrated that there was no ERs expression in levator ani muscles. It may suggest that levator ani muscle was not the direct target organ of estrogen, and estrogen may have effect on levator ani muscle cell in some other way.

(4) It seemed that lower serum estrogen level and expression of ER α acted to depress regulating function of estrogen on pelvic fascia tissue, recessive of pelvic fascia tissue and function of levator ani muscle covered by it. The positive expression rate of ER α degraded in SUI, suggested that ER α had different way to introduce estrogen regulation of functional gene in target cell. It meant that ER played an important role in etiology of SUI. Also, ER β possibly played a different function of occurrence of SUI. The lower ER β in the tissues around levator ani muscle of SUI women may be the reason that estrogen replace treatment was not effective for SUI.

Concluding message

Pathogenesis of premenopausal SUI had relation with lower serum estradiol level. There was significant correlation between the expressions of ER α and SUI. There was also significant correlation between the positive expression rate of ER α and ER β and ER α may play different functions in occurrence of SUI.

References

- 1 BJU Int 2004;93 (3):415-6.
- 2 Obstet Gynecol 2003;102 (6):1283-90.
- 3 Am J Obstet Gynecol 2002;186 (3):416-21.

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| Specify source of funding or grant | No. |
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| What were the subjects in the study? | HUMAN |
| Was this study approved by an ethics committee? | Yes |
| Specify Name of Ethics Committee | Peking Union Medical College Hospital ethics committee |
| Was the Declaration of Helsinki followed? | Yes |
| Was informed consent obtained from the patients? | Yes |