

## RELATIONSHIP BETWEEN SERUM ESTROGEN / PROGESTERONE LEVELS AND EXPRESSION OF THEIR RECEPTORS, AND STRESS URINARY INCONTINENCE IN LATE PREGNANT PRIMIPARA

### Hypothesis / aims of study

To study the relationship between serum concentrations of estrogen/progesterone and their receptors, and stress urinary incontinence (SUI) in late pregnant primipara, and to investigate the remodeling conditions of pelvic floor in late pregnancy.

### Study design, materials and methods

From Feb. 2008 to Dec. 2010, 71 late pregnant primipara who took regular prenatal examination in the out-patient department were studied. They signed a consent form approved by the institutional review board. All of them had neither pregnant complications nor medical conditions such as diabetes, hypertension, chronic respiratory diseases. 33 women with SUI composed SUI group. The other 38 without SUI were as the control group. Serum samples were extracted during 36~40 week's pregnancy. The serum concentrations of estradiol (E2), estriol (E3), progesterone (P) were detected by Chemiluminescent enzyme immunoassay. In 51 vaginal delivery women, the pelvic floor tissue expression of estrogen receptor (ER) and progesterone receptor (PR) were determined by Immunohistochemistry (IHC). The pathological examination with HE staining and examination with transmission electron microscope (TEM) of deep pelvic floor tissues were carried out in those 51 women. Otherwise, 3 normal voluntary women were as the control group.

### Results

The serum E2 concentrations of the SUI group and control group were  $24.3 \pm 7.68 \mu\text{g/L}$  and  $24.2 \pm 7.92 \mu\text{g/L}$  respectively, and the serum concentration of E3 were  $18.9 \pm 12.2 \mu\text{g/L}$  and  $17.2 \pm 11.5 \mu\text{g/L}$  respectively. There were no significant differences in E2 and E3 between the two groups ( $P > 0.05$ ). But the serum concentration of P in the SUI group was significantly lower than that in the control group ( $184.7 \pm 48.2 \mu\text{g/L}$  vs  $223.2 \pm 93.5 \mu\text{g/L}$ ,  $p < 0.05$ ). The examination of both pathology with HE staining and TMC showed there were vacuolar degeneration, filament alteration and edema in the smooth muscles of deep pelvic floor. The expression ratios of ER and PR were significantly higher in non SUI women than that in SUI women. There were significant differences in ER and PR expression between two groups ( $P < 0.05$ ). There was on ER or PR expression in pelvic floor skeletal muscles.

### Interpretation of results

Estrogen works in the ani muscle, connective tissues and pelvic floor nerves. The estrogen and progesterone receptors were decreased in the SUI patients after menopause. Findings from our study showed that lower serum concentrations of estrogen/progesterone and lower expression of estrogen and progesterone receptor in the pelvic floor tissue related with pelvic floor dysfunction during pregnancy. So we speculate that estrogen and P correlated with the dysfunction in pregnancy.

### Concluding message

Both estrogen and progesterone protected the pelvic floor in late pregnant primipara.

### References

8. Copas P, Bukovsky A, Asbury B, et al. Estrogen, progesterone, and androgen receptor expression in levator ani muscle and fascia J. J Womens Health Gend Based Med. 2001,10(8):785-95.
4. Reisenauer C, Shiozawa T, Oppitz M, et al. The role of smooth muscle in the pathogenesis of pelvic organ prolapse--an immunohistochemical and morphometric analysis of the cervical third of the uterosacral ligament J. Int Urogynecol J Pelvic Floor Dysfunct. 2008, 19(3):383-9
7. Zong W, Meyn LA, Moalli PA. The amount and activity of active matrix metalloproteinase 13 is suppressed by estradiol and progesterone in human pelvic floor fibroblasts J. Biol Reprod, 2009, 80(2):367-37

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<b>Is this a clinical trial?</b>	No
<b>What were the subjects in the study?</b>	HUMAN
<b>Was this study approved by an ethics committee?</b>	Yes
<b>Specify Name of Ethics Committee</b>	the institutional review board of hospital
<b>Was the Declaration of Helsinki followed?</b>	Yes
<b>Was informed consent obtained from the patients?</b>	Yes