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DISTINCT GENE AND PROTEIN EXPRESSION PROFILE IN HUMAN URETHRAL RHABDOSPHINCTER

Hypothesis / aims of study

Urethral rhabdosphincter (RS) has an important role to keep urinary continence but has been reported to be possibly different anatomically and embryologically from the other skeletal muscles (e.g. limb muscles or pelvic floor muscles etc.), and therefore suggested that RS may be different in gene and/or protein expressions from other skeletal muscles. In this study, we identified specific mRNAs and proteins to human RS compared to levator ani (LA) muscles, which was a part of pelvic floor muscles.

Study design, materials and methods

Human RS and LA were obtained from bladder cancer patients who underwent radical cystectomy. A portion of RS and LA specimens were immediately frozen in isopentane, and stored in liquid nitrogen until used. They were sectioned as 10-µm thick slices with a cryostat. To identify the specific genes and proteins to RS, we examined 1) cDNA microarray analysis of RS and LA, 2) Liquid chromatography coupled with tandem mass spectrometry (LC-MS/MS) of the muscle fibers. On the basis of these data, we consecutively examined the expression of specific transcripts and/or proteins in RS by quantitative RT-PCR, western blotting and immunohistochemistry.

Results

1) The cDNA microarray analysis revealed significant upregulation of 654 genes in RS such as muscle specific gene, neural receptor, adhesion molecule and cytokine related genes compared to LA.
2) LC-MS/MS, 89 and 80 proteins were detected in muscle fibers in RS and LA, respectively, and 38 were specifically detected in RS. Among those specifically overexpressed genes and proteins in RS, 18 genes and protein were commonly detected in both cDNA microarray and LC-MS/MS analysis.
3) The data of qRT-PCR and western blotting validaqted the overexpression of decorin, which a part of extracellular matrix, in human RS.

Interpretation of results

The present study demonstrated the distinct gene and protein expression profile in human RS and suggested the different characteristic functions of RS from those of the skeletal muscles.

Concluding message

Decorin is one of the specific factors in RS and may be related to an important role of urinary continent mechanism.

Disclosures

Funding: none **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** oita university **Helsinki:** Yes **Informed Consent:** Yes