608

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SEX AND AGE-RELATED CHANGES OF CONNEXIN 43 EXPRESSIONS IN NORMAL RATS

Hypothesis / aims of study

Gap junctions are intercellular channels that facilitate electrical and metabolic communication between the intracellular compartments of adjacent cells and exchange of electrical signals. Connexin 43 is the most predominant connexin expressed on rat detrusor muscle cells [1]. Many previous studies have reported increased connexin 43 expression in overactive bladder or partial bladder outlet obstruction [2-3]. However, no sex or age-related changes of connexin 43 expressions were reported on normal bladder yet. We investigated connexin 43 expressions in various age groups in either sex in normal rats.

Study design, materials and methods

A total of 80 sprague-dawley rats were divided into male group and female group and were A total of 80 Sprague-Dawley rats were divided into male group and female group and were quantified at 1 week, 2 weeks, 1 month, 3 months, and 6 months of age. In each animal, bladder was removed and fresh-frozen in liquid nitrogen. Total RNA extraction was done with easy-BLUE total RNA extraction kit. RTPCR was done for connexin 43 and GAPDH as an internal control using ImProm-II Reverse Transcription System.

Results

In female rats, no age-related change was detected in connexin 43 expressions. In male rats, connexin expression at 3 month of age showed significant decrease than 1 week, 2 weeks, and 6 months of age ($p<0.05$, figure). Comparing connexin expression at the same age in male and female, only 3 months group in male showed significant decrease.

Interpretation of results

Some of the previous studies for connexin 43 expressions in rat model used weight criteria (for example, 200-220 gram of weight) and not signify ages of the experimental animals. Our data suggest that the expressions of connexin 43 mRNA in normal detrusor muscle cell showed age-related changes especially in male rats. Although it is difficult to interpret these findings at this stage, age should be considered as a possible compounding factor affecting connexin 43 expressions in male rats.

Concluding message

The expressions of gap junction protein connexin 43 showed age-related changes in male rats. Adult male rats showed decreased connexin 43 expression than infant or old rats. The clinical implication of these findings needs further investigation.

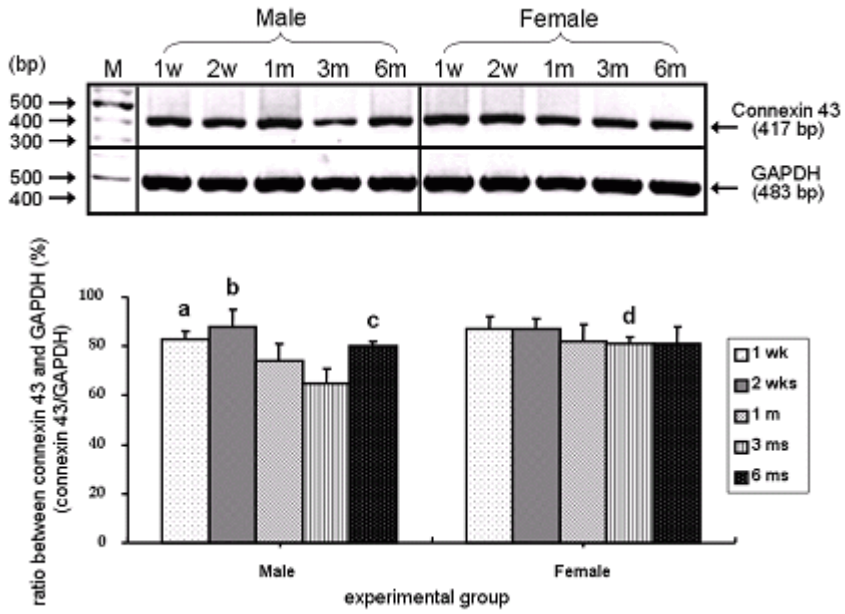

Figure. Quantitative determination of the PCR bands for connexin 43 in normal rats.
M, marker; 1w, 1 week-group, 2w, 2 week-group; 1m, 1 month-group; 3m, 3 month-group; 6m, 6 month-group;
a, b, c, d : significant increase than male 3 month-group ($p< 0.05$).

References

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Were guidelines for care and use of laboratory animals followed or ethical committee approval obtained?	**Yes**
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