

## PCREB IMMUNOHISTOCHEMICAL STAINING OF DORSAL ROOT GANGLIA AFTER ACUTE AND REPEATED URINARY PATHOGENIC E. COLI INFECTION INTO RAT BLADDER

### Hypothesis / aims of study

Stimulation of bladder induces up-regulation of neurotrophins that may contribute to voiding reflex. Bacterial infection also can stimulate bladder. Phosphorylated responsive element of binding protein (pCREB) is an important transcriptional factor in the neurotrophin signaling pathway. Several studies have reported that pCREB is up-regulated in afferent neuron of rat DRG (dorsal root ganglia) by chemical induced cystitis(1, 2). The aim of this study is to examine the change of pCREB in DRG after repeated UPEC (Uropathogenic Escherichia coli) infection of rat bladder.

### Study design, materials and methods

Twelve, female Sprague-Dawley rats (280- 300 gm) were treated with saline (control, Group A) or with acute E.coli infection (Group B) or with repeated E.coli infection (once a week x 4 times, Group C). One day after saline instillation or E.coli infection or seven days after repeated UPEC (Uropathogenic Escherichia coli) infection, animals were anesthetized with sodium pentobarbital (60 mg/kg, ip) and perfused with PBS (0.05 Mol), followed by 4 % paraformaldehyde. After the perfusion, DRG were quickly removed and postfixed. In DRG from control, acute and repeated E.coli infection rats, positive stained cells were counted in 6-10 sections of each selected DRG (L1, L2, L4-S1). The cells with a clear visible nucleus were counted. The pCREB of immunoreactivity (IR) are presented as the number of IR positive cells in each selected ganglia (mean  $\pm$  S.D.) ANOVA test was used for comparison among control, acute and E.coli infection group and for comparison among DRG in each group.

### Results

p-CREB-IR was observed in nuclear profiles and mainly restricted to relatively small diameter cells in all DRG levels (L1-L6, S1). Number of p-CREB-IR cell of group B (acute UPEC infection) did not show significant difference in comparison with group A (control) ( $p>0.05$ ). Number of p-CREB-IR cell of group C (repeated UPEC infection) was significantly greater than that of group A ( $p<0.05$ ). The number of p-CREB-IR cell in L3-L6 and S1 DRG was significantly greater than that of group B ( $p<0.05$ ). In group A and B, p-CREB-IR cell number in L4-L5 DRG was significantly smaller than that of other level DRG ( $p<0.05$ ). In group C, p-CREB-IR cell number in L6 and S1 DRG was significantly greater than L4-L5 DRG ( $p<0.05$ ).

### Interpretation of results

The number of IR cell of p-CREB in repeated UPEC infection group increases more than in control or acute infection group.

### Concluding message

These results suggest that repeated UPEC infection might induce reorganization of voiding reflex.

### References

1. J Comp Neurol (2005) 482;142-154.
2. J Comp Neurol (2004) 469; 262-274.

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<b>Is this a clinical trial?</b>	<b>No</b>
<b>What were the subjects in the study?</b>	<b>ANIMAL</b>
<b>Were guidelines for care and use of laboratory animals followed or ethical committee approval obtained?</b>	<b>Yes</b>
<b>Name of ethics committee</b>	<b>Kyung Hee Medical Center Animal Research IRB</b>