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## Comparison of the effects of carbamyl- $\beta$ -methylcholine chloride administered by intravenous, intramuscular and intra-acupuncture point injections

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**Objective:** To compare the effects of carbamyl- $\beta$ -methylcholine chloride (CMCC) administered by intra-acupuncture point injection (IAI), intramuscular injection (IMI), and intravenous injection (IVI), and to analyze the mechanisms.

**Methods:** In the IAI group, CMCC was injected into the Zusanli acupoint (ST 36) immediately after 30-min stimulation by electro-acupuncture (EA) at the acupoints, and into the femoral vein and skeletal muscle in IVI and IMI groups, respectively. Intra-gastric pressure was detected. The plasma concentration of CMCC was measured at various times.

**Results:** The gastric effect of CMCC in the IVI group was enhanced and attenuated more rapidly than in the other groups. In the IAI group, this effect was significantly stronger than that in the IMI group at 2 min and 15 min, but not significantly different between the two groups at 5 min and 30 min. Plasma concentration of CMCC in the IAI group was similar to that in the IVI group at 2 min, but higher than that in the IMI group. The concentration in the IAI group was higher than that in the IV group and similar to that in the IMI group at 5, 15 and 30 min, indicating rapid increase and slower reduction of the plasma concentration of the drug in the IAI group. There was a positive correlation between the plasma concentration of CMCC and intra-gastric pressure in all groups.

**Conclusion:** The effect of IAI with CMCC was stronger than that of IMI and longer-lasting than that of IVI, which correlated with the blood concentration of CMCC.

### Biography

Junhong Gao is working as Associate Professor of Institute of Acupuncture and Moxibustion, China Academy of Chinese Medical Sciences and Master's tutor. His research interest is to explore the mechanism of acupuncture and moxibustion and joint administration of acupuncture and drugs. So far totally 3 research projects are/were granted by National Natural Science Foundation of China and Natural Science Foundation of Beijing (as the principal investigator), and more than 40 articles in total were published in reputed journals.

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