

## Summary

### **Difference in $^{201}\text{TlCl}$ Accumulation Mechanism in Brain Tumors: A Comparison of Their $\text{Na}^+\text{-K}^+$ ATPase Activities**

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The accumulation levels of  $^{201}\text{TlCl}$  and  $\text{Na}^+\text{-K}^+$  ATPase activity in tumor tissue were compared among glioblastoma, benign glioma and meningioma to study the difference in the mechanism of  $^{201}\text{TlCl}$  accumulation. The subjects were 19 cases comprised of 6 glioblastoma, 2 oligodendroglioma, 1 fibrillary astrocytoma, 1 pilocytic astrocytoma and 9 meningioma. Preoperative  $^{201}\text{TlCl}$  SPECT was performed in all the cases, and Thallium Index (TL index) was calculated by a ratio of  $^{201}\text{TlCl}$  in the tumor area and the contralateral area. In addition, cell membrane was extracted from the tumor tissue collected intraoperatively to determine  $\text{Na}^+\text{-K}^+$  ATPase activity. No statistically significant difference in TL index was noted between the glioblastoma group ( $6.97 \pm 2.67$ )

and the meningioma group ( $5.87 \pm 1.99$ ). This fact showed that there was no difference in the accumulation level of  $^{201}\text{TlCl}$  between the two groups. On the other hand, the glioblastoma group indicated a higher value of  $\text{Na}^+\text{-K}^+$  ATPase activity ( $49.13 \pm 43.76 \mu\text{mole/hour/mg protein}$ ) than the meningioma group ( $7.73 \pm 13.84 \mu\text{mole/hour/mg protein}$ ) ( $p < 0.05$ , t test). These results suggested the involvement of  $\text{Na}^+\text{-K}^+$  ATPase activity in  $^{201}\text{TlCl}$  accumulation in glioblastoma and the influences of other accumulation mechanism than  $\text{Na}^+\text{-K}^+$  ATPase activity such as the volume of intratumoral vascular bed in meningioma.

**Key words:**  $^{201}\text{TlCl}$ , SPECT,  $\text{Na}^+\text{-K}^+$  ATPase activity, Brain tumor.