

The Effect of Coffee Aroma on the Brain Function: Results from the Studies of Regional Cerebral Blood Flow Through Positron Emission Tomography and Event-Related Potential (ERP)

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SUMMARY

The effect of coffee aroma on the brain function was compared with the other odours by measuring rCBF and ERP. RCBF was measured in 24 ROIs in both hemispheres by using PET scanner. The P300, one of the ERP components, was recorded during the visual oddball task.

The rCBF value under coffee aroma was highest among the three samples (coffee aroma, lavender oil, distilled water) in the most ROIs of the right hemisphere particularly in the four areas (piriform cortex, hippocampus, nucleus accumbens septi, orbitofrontal cortex) closely related to emotional expression, and processing of an olfactory input. Compared with the rCBF value under coffee aroma of the left hemisphere, the value of the right hemisphere was higher in any pair of ROIs. On the other hand, rCBF value of the aforementioned four areas including some parts of the limbic systems was higher in the left hemisphere compared with in the right hemisphere under the other two samples. In the P300 experiment, the effect of coffee aroma was compared with that of lemon oil odour, lavender oil odour, isovaleric acid odour and distilled water. Different from the result of the male subjects, the P300 amplitudes of the female subjects under coffee aroma were significantly larger than those under isovaleric acid odour, and under lavender oil odour. Moreover, the amplitudes of the females was significantly larger than those of the males but lavender.

The hemispheric differences of rCBF caused by coffee aroma show the physiological evidence of the unique effect of coffee on human brain function through its aroma. Furthermore, it is suggested from the result of ERP that coffee aroma affects males and females in a different way.