Decreases in blood perfusion of the anterior cingulate gyri in Anorexia Nervosa Restricters assessed by SPECT image analysis

ABSTRACT

These findings suggest that some localized functions ofthe ACCare possibly relevant to the psychopathological aspects of AN-R.

INTRODUCTION

Background A number of studies have documented important and reliable differences between AN-R and AN-BP. Restrictive patients are distinguished by the presence of interrelated psychological characteristics; a distortion of body image, misperception of internal sensations, and an underlying sense of ineffectiveness, or have a weight phobia based on the preoccupation to maintain a subpubertal body weight and to avoid weight gain. Evidence from non-invasive techniques has encouraged the belief that modern neurobiological approaches can be used in the quest for understanding complex frontal cortical function. Positron emission tomography (PET) study has described relative regional hypometabolism in frontal and parietal area in the patients with anorexia nervosa. A functional MRI study revealed that visual stimuli of high calorie foods increased regional cerebral blood flow (rCBF) in ACC, insula and paralimbic area of patients with anorexia nervosa. Using the ROI (region of interest) we previously reported decreases at rest and increases after food intake in %change of blood flow over a wide range of the cerebral cortex, primarily the frontal lobes, in anorexic patients. We have recently demonstrated that AN-BP subjects may show specific activation in right anterior cortical regions using the same ROI method. It is, however, difficult to select ROIs and analyze large areas of the human brain using the ROI method of SPECT examinations. Contrary to this, the statistic parametric mapping (SPM) 96 method allows for a better ability to SPECT studies assessing brain functions in large brain areas, and may be as informative as PET or fMRI. The SPM 96 method, which was developed to analyze focal changes inregional cerebral blood flow (rCBF), is an automated and objective approach. We apply this approach to SPECT image data sets, specifying the regional abnormality in rCBF in more detail.

CONCLUSION

By using SPM analysis we have demonstrated a decreased area of rCBF in frontal lobe regions mainly containing the ACC in restrictive anorexia nervosa patients. The ACC is thought to be very important in regulating a wide range of human brain functions such as refinement of signals from organs, cognitive process of selection following somatosensory stimuli, mood regulation, and so forth. The present findings therefore suggest that disturbed higher brain function may have an important role in producing the clinical symptoms of the patients with restrictive anorexia nervosa.