TITLE: THE CONTROL OF BLOOD PRESSURE WITH DEEP BRAIN STIMULATION

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Abstract;
It has been known for some time that stimulation of the Periaqueductal Grey region in animal models can influence the autonomic nervous system. 15 patients were routinely implanted with Periventricular/Periaqueductal Grey (PVG/PAG respectively) deep brain stimulators for the alleviation of chronic neuropathic pain syndromes. We measured continous blood pressure (BP) and heart rate in these patients post-operatively (and in 3 patients intraoperatively) whilst altering the stimulation parameters. In 7 patients, we were able to reduce BP and in 6, we raised BP. Localisation of the electrodes using a post-operative magnetic resonance (MR) image shows that there is a functional localisation within the area in that the ventral electrodes produced a depressor response and the dorsal electrodes produced a pressor response. Further analysis of changes in pulse pressure, no change in heart rate, and power spectral analysis suggest that the changes are secondary to changes in sympathetic outflow. These results have ramifications for the control of blood pressure using neuromodulation as well as providing an interesting insight into the possible mechanisms of neuropathic pain.