Correlation Between Antinociception and Aversion from Stimulation of Forebrain Sites in the Rat

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At many sites in the brain, electrical stimulation with low current intensity is both aversive and causes antinociception. In view of the well documented antinociception caused by various types of stress (Watkins *et al.* 1982) and pain (Wand-Tetley 1945; Le Bars *et al.* 1979), it is possible that in some parts of the brain the antinociception is secondary to the stress of the stimulation. At 114 sites in the rat brain the intensity of stimulation required to evoke an aversive response (struggle, escape or vocalization) has been compared with the antinociceptive current intensity (tail-flick to noxious heat). Only stimulation in the dorsal hippocampus and pretectal area caused antinociception without significant aversion. Strong aversion resulted from stimulation of 46% of the sites including the central grey and nucleus raphe magnus. Antinociception was significantly correlated with the aversiveness of the stimulation ($p < 0.005$) although in 15% of the stimulation sites strong aversion was seen with no antinociception.

TABLE 1. THE NUMBER OF SITES SHOWING AVERSIVE AND ANTINOCICEPTIVE RESPONSES TO STIMULATION UP TO A MAXIMUM CURRENT OF 35 μA r.m.s.

		antinociception		
		present	absent	total
aversion	present	35 $(i_{an} = 27.4 \pm 1.8\ \mu A)$ $(i_{av} = 24.0 \pm 1.6\ \mu A)$	17 $(i_{av} = 24.3 \pm 2.7\ \mu A)$	52
	absent	25 $(i_{an} = 22.3 \pm 2.7\ \mu A)$	37	62
	total	60	54	114 $(i_{an} = 24.9 \pm 1.8\ \mu A)$ $(i_{av} = 24.1 \pm 1.5\ \mu A)$

i_{an} = mean brain stimulation current threshold for antinociception $\pm$ s.e.
i_{av} = mean aversive current threshold $\pm$ s.e.

It is concluded that there can be little justification in assigning a primary antinociceptive role to a brain area that evokes strong escape reactions when stimulated.

References

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