

Cold-induced glutamate release in vivo from the magnocellular region of the paraventricular nucleus is involved in ovarian sympathetic activation

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We previously reported that centrally-induced sympathetic activation in response to cold stress is associated with a polycystic ovarian condition in rats, and thyrotrophin-releasing hormone (TRH) released locally from the magnocellular region of the paraventricular nucleus (PVN) appears to be involved in this activation. Because TRH neurones express NMDA glutamate receptors, in the present study, we investigated the role of glutamate in the increased release of TRH from magnocellular neurones induced by cold stress and its relationship to ovarian neurotransmission. Animals with a push-pull cannula stereotaxically implanted into the magnocellular portion of the PVN were exposed to cold stress (4 °C for 64 h) and subjected to intracerebral perfusion. Perfusate fractions were obtained and analysed by high-performance liquid chromatography to measure glutamate and GABA levels. Glutamate, but not GABA, release increased significantly in animals perfused under cold exposure. In vivo administ