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Determination of Histamine Released from Rat Hypothalamic Mast Cells Activated by Compound 48/80

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INTRODUCTION

The objective of the present study was to apply a reliable combined methodology for the determination of histamine release from hypothalamic mast cells, following administration of compound 48/80 (C48/80) (1-4). This study was based on the currently limited data regarding the interaction between mast cell-derived and neuronal histamine in the brain (5).

METHODS

Male Wistar rats were used throughout the experimental procedures. Immediately after sacrifice, the brain was removed and the hypothalamus was dissected out. Rat brain mast cells (RBMC) were obtained from hypothalamic tissue following a double digestion with tryptase, after modification of the method of Purcell and Atterwill (3). Aliquots of RBMC were incubated either in the absence (control) or in the presence of 0.1mg/ml C48/80 alone or in combination with sodium 0.055mg/ml cromoglycate (CRM). The histamine released in the incubation medium after 30 min of incubation was measured fluorophotometrically, following the extraction of the amine (1,2). The total histamine content of the RBMC samples was also quantified.

RESULTS

The histamine levels in the incubation medium of the RBMC incubated with C48/80 for 30 min were statistically significantly reduced to 32.21±2.7 % (n=6-9, $P<0.001$) upon co-administration of CRM.

CONCLUSIONS

By using the combined method for the isolation of RBMC and the fluorophotometric determination of the released histamine, it was demonstrated that histamine release following degranulation with C48/80 was dependent upon the stabilization of the mast cell membrane. Therefore, the presented methodology is reliable and could be applied in the pharmacological differentiation of the role of neuronal and mast cell-derived histamine in the central nervous system.

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