

## Effects of Magnesium on Mast Cell-Stabilization

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### Summary

Adrenaline is the first-choice drug for anaphylaxis, since it quickly inhibits the release of histamine from mast cells. However, there are several cases that are resistant to adrenaline. Magnesium is one of the essential minerals for human body mainly consumed from daily foods. Besides health promoting functions, such as bone formation, helping to relax muscle and nervous tension, magnesium is known to exert anti-allergic effects. In the present study, using the differential-interference contrast (DIC) microscopy, we examined the effects of adrenaline (1  $\mu$ M to 1 mM) and magnesium chloride ( $MgCl_2$ ) (1 to 100 mM) on the degranulation from rat peritoneal mast cells. Both adrenaline and  $MgCl_2$  dose-dependently decreased the numbers of degranulating mast cells. At relatively higher concentrations, such as 50 and 100 mM,  $MgCl_2$  markedly suppressed the numbers of degranulating mast cells. However, at concentrations equal to or lower than 25 mM, it did not significantly affect the numbers of degranulating mast cells. Of note, higher concentrations of  $MgCl_2$  synergistically enhanced the suppressive effect of adrenaline on mast cell degranulation. The results provided in vitro evidence that magnesium dose-dependently inhibited the process of exocytosis, and that it synergistically potentiated the mast cell-stabilizing property of adrenaline.