



Letter to the Editor

EPINEPHRINE AND NOREPINEPHRINE INCREASE LYMPHOCYTE MIGRATION IN A DOSE-DEPENDENT MANNER

I. Frydas*

Aristotelian University, Laboratory of Microbiology and Infectious Diseases, School of Veterinary Medicine, Thessaloniki, Greece.

*Correspondence to:

Ilias Frydas, MD,
Laboratory of Microbiology and Infectious Diseases,
School of Veterinary Medicine,
Aristotle University of Thessaloniki,
Thessaloniki, Greece.
e-mail: frydas@vet.auth.gr

KEYWORDS: *epinephrine, norepinephrine, lymphocyte, inflammation, immune response*

INTRODUCTION

Epinephrine and norepinephrine are endogenous anti-inflammatory catecholamines, highlighted in the 1960s by Spector and Willoughby (1). They are immediately released after an inflammatory process as a protective response to try to restore the normal physiological state of the tissue. Furthermore, norepinephrine inhibits vascular permeability, an effect that characterizes the inflammatory process (2).

Catecholamines are endogenous compounds that have long been known to modulate inflammatory responses (3-6). Receptors for catecholamines have been shown on the lymphocyte cell membrane; neurotransmitter agonists and antagonists have been used to study lymphocyte proliferation and modulate antibody synthesis (7,8). Catecholamines inhibit NF- κ B in various cell types via the activation of cyclic AMP/protein kinase A (cAMP/PKA), which leads to the activation of 5' adenosine monophosphate-activated protein kinase (AMPK) (9). In addition, epinephrine and norepinephrine inhibit NF- κ B, which leads to the suppression of pro-inflammatory cytokines (5).

Here, in this study, we report that epinephrine and norepinephrine increase the migration of lymphocytes in outbred young rats.

Chemotaxis assay:

Wistar rats were used as donors of lymphocytes from the thymus. The tissues were minced and passed through cotton wool and a nylon filter to eliminate the cell debris. After filtering the cells, they were washed in Eagle's minimal essential medium and spun at 150 x g.

Lymphocyte locomotion assay was performed using modified Boyden chambers. A cell suspension of 0.5 ml (1x10⁶ cells/ml) was pipetted into the upper compartment of the chamber, which was separated from the epinephrine or norepinephrine-containing compartment below by an 8 μ m pores filter. After incubation (at 37°C for 5 h), the filters were fixed, and cells were counted at every 10 μ m level, starting from the proximal to distal surface. The locomotion index (LI+m) was calculated as described by Moderato et al. (10).

Received: 18 January, 2019
Accepted: 02 March, 2019

2279-5855 (2019)

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RESULTS AND DISCUSSION

In this paper, we show that epinephrine or norepinephrine enhances the migration of lymphocytes in a dose-dependent manner. The dose-response bars are shown in Fig. 1 (Fig.1). The locomotion index, LI+m of the controls, is 22.5 +/- 0.9.

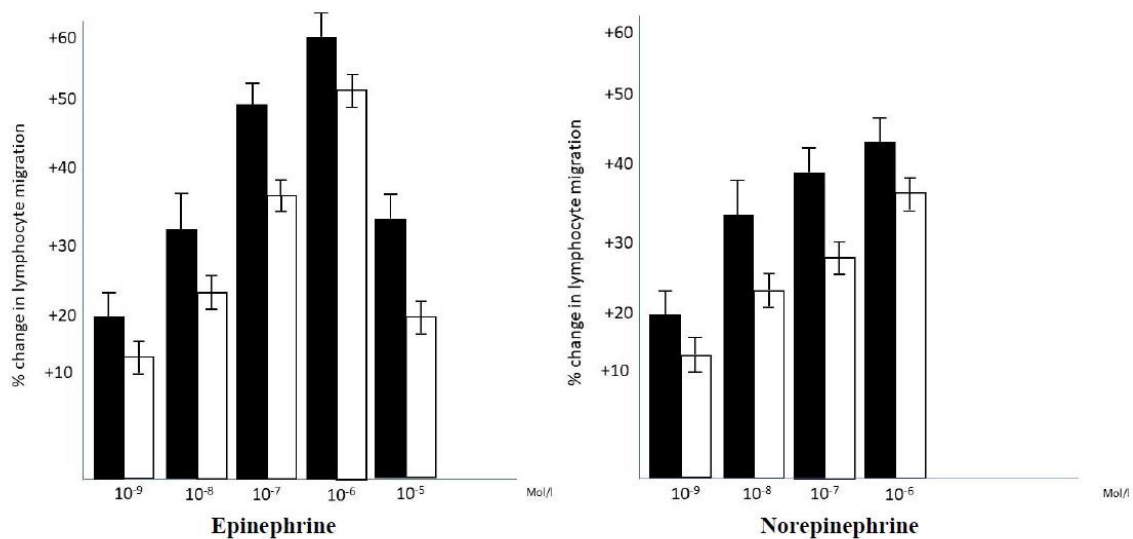


Fig. 1. Effect of epinephrine and norepinephrine on the migration of rat thymus lymphocytes. Epinephrine treatment causes an increase in lymphocyte migration (black bars) compared to lymphocyte migration without treatment (white bars). Similar effects were obtained when the cells were treated with norepinephrine. These results show that these two catecholamines increase lymphocyte migration in a dose-dependent manner.

Here we show that epinephrine or norepinephrine stimulates the migration of rat thymus lymphocytes in physiological and pathophysiological concentrations, an effect that makes these two catecholamines important players in the dynamics of the inflammatory and immunological responses.

Conflict of interest

The author declares that they have no conflict of interest.

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