American Journal of Pharmacology and Pharmacotherapeutics
ISSN 2393-8862
2020
Vol.7 No.3

Thymol differently affects rat cellular immune response after L-arginine injection

Nikola Stojanović,

MD, Faculty of Medicine, University of Niš;

Abstract

Statement of the Problem: Thymol (2-isopropyl-5-methylphenol) is a natural monoterpene phenol,a derivative of *p*-cymene, and an isomer of carvacrol [1]. It is one of the most important constituents of thyme essential oils, which have been used for centuries in traditional medicines of many nations. Acute pancreatitis (AP) is an inflammatory process of the pancreas, which exhibits a broad clinical spectrum and can be either mild or severe. Since AP is an inflammatory disorder, a complex cascade of immunological events, which affect both the pathogenesis and the progression of the disease, is developed [2]. Thus, the aim of the present study was to investigate the potential modulatory properties of thymol on rat immune cell viability and activity after acute pancreatitis induction. **Methodology:** Acute pancreatitis was induced by injecting L-arginine in a single dose of 350 mg/100 g of body weight [3]. Three experimental groups of animals (six rats per group) were treated *per os* 1 h before injection of L-arginine. Group I (control/vehicle-treated) received olive oil in a dose of 0.4 ml/kg, while groups II and III (thymol treated) received 50 and 100 mg/kg of thymol, respectively. Viability of peritoneal macrophages and bone marrow cells (BMCs) was evaluated in an MTTassay, while the functional characteristics of macrophages were tested in methylene blue and myeloperoxidase (MPO) assays. **Findings:** Thymol at the lower dose caused a statistically significant decrease in macrophage viability when compared to the viability of peritoneal cells isolated from rats with AP. The higher tested dose of thymol (100 mg/kg) showed BMCs viability increase in comparison to the viability of BMCs isolated from rats with AP. The macrophage adherence was increased after AP induction, but both tested doses of thymol statistically significant decreased this function of the immune cells. On the other hand, further results showed that MPO activity was increased in peritoneal macrophages after L-arginine injection. Thymol, in the higher dose, additionally increased the enzyme activity.In this study, we showed that thymol has the potential to modulate immune cell viability and functioning in an inflammatory reaction, such as the one seen during the course of AP.

Image

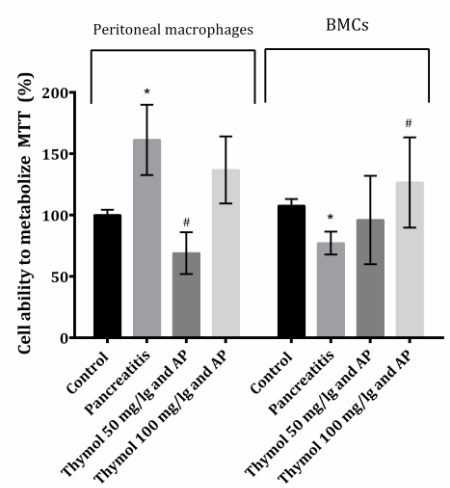

Figure 1. Macrophage and bone marrow cells (BMCs) ability to metabolize MTT. Data are presented as the mean ± SD; the statistical significance was calculated by One-way ANOVA followed by Tukey's post hoc test. *p < 0.01 vs. the control group.; #, p<0.0001, thymol treatment (50 mg/kg) vs. induced pancreatitis.

.Biography:

Nikola Stojanović (born in 1990) obtained his MD degree at the Department of Medicine (Faculty of Medicine, University of Niš, Serbia) and was awarded as the best graduate student for the school year 2014/2015. He began his research work during the second year of his studies (9 years ago) and he is now doing a large number of specialized *in vivo* and *in vitro* experiments in the fields of pharmacology, toxicology, biology, immunology, and microbiology of active natural/synthetic compounds. Besides that, Nikola Stojanović is an author and co-author of a number of publications in highly esteemed peer-reviewed journals.

Speaker Publications:

Recent publications

1. Peixoto-Neves D, Silva-Alves KS, Gomes MD, Lima FC, Lahlou S, Magalhaes PJ, Ceccatto VM, Coelho-de-Souza AN, Leal-Cardoso JH (2010) Vasorelaxant effects of the monoterpenic phenol isomers, carvacrol and thymol, on rat isolated aorta. Fundam. Clin. Pharmacol. 24:341-350.
2. Habtezion A, Algul H (2016) Immune modulation in acute and chronic pancreatitis. Pancreapedia: Exocrine Pancreas Knowledge Base.
3. Hegyi P, Rakonczay Jr Z, Sári R, Góg C, Lonovics J,

Takács T, Czakó L (2004) Larginine-induced experimental pancreatitis. World J. Gastroenterol. 15:2003–2009.

8thEdition of International Conference on Pharmacognosy and Medical plants; Rome, Italy- March 09-10, 2020.

Abstract Citation:

Nikola Stojanović, Thymol differently affects rat cellular immune response after L-arginine injection**,** Pharmacognosy 2020, 8thEdition International Conference on Pharmacognosy and Medical Plants; Rome, Italy- March 09-10, 2020.