Apolipoprotein E Attenuates Acute Inflammatory Response of Monosodium Urate Crystal-Induced Gouty Arthritis in Rats

Mohammad Vico Rizkita Wisnu L[1], Andrew Jonatan[1], Kusworini Handono[2]

1Undergraduate student, [Faculty of Medicine], [Universitas Brawijaya], [Indonesia]
2Department of Clinical Pathology, [Faculty of Medicine], [Universitas Brawijaya], [Indonesia]

Introduction: Gouty arthritis is a joint inflammation induced by deposit of monosodium urate (MSU) crystals in the synovial fluid. It is one of the most common inflammatory arthritis and associated with irreversible joint damage. Previous studies demonstrated that Apolipoprotein E (ApoE)possess immunomodulatory effect in acute inflammatory response by altering both cellular and humoral immunity through various mechanisms. Thus, our study was aimed to investigatethe effects of ApoE administration toward activation ofacute inflammatory response ofMSU crystal induced gouty arthritis in rats.

Methods: We conduct an in vivo true experimental research with randomized post-test only controlled group design in 18-20 weeks old male Wistar strain *Rattus norvegicus*. Acute gouty arthritis was induced using 0.25mg/50 l monosodium urate (MSU) crystal injection in the right genu. Twenty five rats were divided into five groups, with group I and II served as non-treated gouty and gouty controls receiving oral colchicine therapy respectively. Group III, IV, V served as treatment groups and received three different doses of intra articular Apo E injection (0.5 µg, 1 µg, and 1.5 µg ApoE respectively). Activation of acute inflammatory response was evaluated by histopathological examination of PMN cells count in synovial tissue of the right genu and analyzing the release of inflammatory mediator by measuring serum TNF-alpha level using ELISA method.

Results: Administration of 0.5 µg Apo E resulted in marked reduction of PMN cells count compared to control group (LSD, p=0.000). Analysis of serum TNF-alpha level also shown significant difference between groups (Kruskal Wallis, p=0.021). We also demonstrated moderate to strong correlation between variables, with strong correlation between increased dose of ApoE and PMN cells count (Linier regression test, p=0.001, correlation: -0.779), and moderate correlation between ApoE doses and serum TNF-alpha levels (Linier regression test, p=0.006, correlation: -0.671).

Conclusion: Intra articular injection of ApoE attenuates the inflammatory response within the synovial tissue by suppressing humoral and cellular immune response and therefore holds promise as a novel intervention strategy for the treatment of gouty arthritis.

Keywords: Apolipoprotein E, PMN, TNF-alpha, MSU, anti-inflammatory, Acute Gouty Arthriti

INHIBITION OF VASCULAR RAREFACTION BY *Physalisangulata* L. LEAF'S WATER-EXTRACT THROUGH ANTIOXIDANT AND ANTIINFLAMMATION IN THE KIDNEY OF ENDOTHELIAL DYSFUNCTION RAT MODEL INDUCED BY L-NAME

Zahrah Febianti[1], Nur Permatasari[2*], Setyawati Soeharto[2]

[1]*Biomedical Sciences, Faculty of Medicine, Brawijaya University, Malang 65145, Indonesia*
[2]*Department of Pharmacology, Medical Faculty, Brawijaya University, Malang 65145, Indonesia*
**Corresponding author: nungky.permatasari@gmail.com*

Background: Kidney vascular density were found to decrease in chronic kidney disease, aging, and endothelial dysfunction. *Physalisangulata* L.leaf's are known to contain physalinwhich can protect vascular by increasing its NO level *invitro*, producing anti-inflammatory and antioxidant effect.

Aim : This study was to investigate the effect of *Physalis angulata*L. leaf's water extract on vascular number, MDA level, and NFkB expressionin kidney of NOS-inhibited male Wistar rats.

Method: In control group, rats were given 40 mg/kg of normal saline intraperitoneallyfor 15 days. In treatment group, rats were given 40 mg/kg of L-NAME alone intraperitoneally, L-NAME plus *Physalis angulata*L. leaf's water extract (500 mg/kg, 1500 mg/kg, 2500 mg/kg by gavage, respectively) for 15 days.

Results and discussion: L-NAME did not significantly decrease vascular number,neither increase MDA levels nor NFkB expression.Administration of extract at dose of 500 mg/kg significantly increased the vascular number but not decrease MDA levels and NFkB significantly. Increasing the dose of extract tended to rise MDA levels, NFkB expression, and decrease vascular number.

Conclusion: This study shows that 40 mg/kg of L-NAME administration i.p for 15 days could not induce vascular rarefaction, oxidative stress, proinflammation state in rat kidney. Italso suggests that *Physalis angulata*L. leaf's water extract at dose of 500 mg/kg could enhance tissue repair by promoting vascularization.

Keywords: Kidney, L-NAME, *Physalis angulata,*vascular rarefaction, MDA, NFkB