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Effect of Kt6 Variant Cowpea (*Vigna Unguiculata*) Extract on Matrix Metalloproteinase-9 and VEGF Expression of Corneal Inflammation Rat Model (*Rattus novergicus* Strain Wistar)

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Abstract: Matrix metalloproteinase-9 (MMP-9), a specialized enzymes capable of proteolytically degrading extracellular matrix proteins, have been postulated to play an important role in angiogenesis. VEGF expression caused activation of angiogenesis stages includes proteolysis, proliferation of endothelial cell, migration and tubulogenesis. Genistein has been reported to be the most potent inhibitor of cancer cell growth in vitro but also impair the proliferation of vascular endothelial cells in corneal neovascularization. In this interventional experimental study, we evaluate the effect of genistein in cowpea (*Vigna unguiculata*) methanolic extract on MMP-9 and VEGF expression in rat corneal-alkali induced inflammation. Sixty three rats were randomly chosen, 3 rats as control, 60 rats were induced with NaOH 1M and administered with 25 μ M, 50 μ M and 100 μ M of genistein from cowpea methanolic extract four times daily. Alkali burn as inflammation model using NaOH 1M infiltration through filter paper which were applied on the center cornea of the right eye for 60 seconds as positive control and cowpea methanolic extract were administered immediately after alkali burn by NaOH. MMP-9 and VEGF expression was observed at 6, 24, 48, 96, and 168 hours by immunohistochemistry. Each dose of cowpea methanolic extract significantly decreased the MMP-9 and VEGF expression ($p=0.000$). Interaction between time of administration and dose of administration had influenced the MMP-9 and VEGF expression. Genistein in cowpea methanolic extract decreased the MMP-9 and VEGF expression on NaOH alkali burn corneal inflammation in rats but time of administration not affected.

Keywords: extracellular matrix (ECM), MMP-9 expression, VEGF expression, cowpea (*Vigna unguiculata*) methanolic extract, NaOH alkali burn.