Centella asiatica (L.) Urban extract administration prevent macrophage polarization towards M1 macrophage on the kidney of diabetic nephropathy rat model

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Background: Diabetic nephropathy (DN) is one of the most devastating complications of diabetes mellitus (DM). Diabetic nephropathy development in diabetes is related with macrophage polarization towards M1 macrophage. Centella asiatica (L.) Urban (C. asiatica) is one of herbs used for nephron-protective agent. It is known to inhibit the activity of Angiotensin Converting Enzyme (ACE).

Objective: To investigate the effect of C. asiatica extract on kidney macrophage polarization of diabetic nephropathy rat model.

Method: Rat was treated with Streptozotocin-Nicotinamide to develop type 2 Diabetes Mellitus (DM). The diabetic nephropathy developed 8 weeks after type 2 DM developed. The rats were divided into 6 groups of treatment which are non DM, DM without treatment, DM with captopril, DM with C. asiatica extract 250 mg / kg BW / day, DM with C. asiatica extract 500 mg / kg BW / day and DM with C. asiatica extract 1000 mg / kgBW / day. Treatment was given for 8 weeks. In the end of the treatment, the rats were put in metabolic cage for urine collection. Blood samples were taken to measure urea serum level. Rats were sacrificed and the kidney was collected for histological examination and M1 and M2 macrophage marker mRNA expression measurement were lower in

Results: Urine protein, serum ureum level and glomerulosclerosis score were lower in C. asiatica extract treated group compared to those on DM without treatment group ($p < 0.05$). The highest M1 macrophage mRNA marker was in DM group. Meanwhile the lowest M2 macrophage mRNA marker was in DM group. The M1/M2 macrophage mRNA marker ratio C. asiatica extract treated group compared to those on DM without treatment group ($p < 0.05$).

Conclusions: C. asiatica extract prevent macrophage polarization towards M1 on rat model of diabetic nephropathy.