The Effect of Centella Asiatica L. Extract on Callus Formation in the Healing Process of Femur Fracture in White Rats (Rattus norvegicus) as an Animal Model

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Abstract:

Background: Bone fractures pose a risk of complications if healing is disrupted, influenced by both mechanical and metabolic factors. *Centella asiatica*, rich in glycosides, may accelerate healing by inhibiting pro-inflammatory cytokines.

Objective: To evaluate the effect of *Centella asiatica* on callus activity during femur fracture healing in white rats (*Rattus norvegicus*).

Method: This laboratory experimental study used a post-test only control group design with a complete randomized design (CRD). Thirty Wistar rats (*Rattus norvegicus*) were divided into three groups: a positive control (fractures treated with NaCl) and two treatment groups receiving *Centella asiatica* extract at doses of 50 mg/kg BW and 100 mg/kg BW. Observations were conducted on days 7, 14, and 21.

Results: This study shows that *Centella asiatica* L. leaf extract significantly enhances callus formation during femur fracture healing in Wistar rats. Both the 50 mg/KgBW/day (Treatment 1) and 100 mg/KgBW/day (Treatment 2) doses increased callus volume compared to the control group, with significant differences observed (P = 0.0001). The higher dose (Treatment 2) resulted in a larger callus volume, suggesting that higher doses of *Centella asiatica* L. extract accelerate fracture healing.

Conclusion: *Centella asiatica* L. extract significantly enhances callus formation during femur fracture healing in Wistar rats. Both doses (50 mg/KgBW and 100 mg/KgBW) increased callus volume, with the higher dose showing a greater effect. This suggests that *Centella asiatica* L. accelerates fracture healing, likely by modulating pro-inflammatory cytokines.