



# Role of N-Acetyl-Cysteine as an Adjuvant Therapy in Patients with Diabetic Foot Osteomyelitis: A Randomized Controlled Trial

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## ABSTRACT

**Introduction:** Osteomyelitis, a known complication of diabetic foot infection with a prevalence of 50%, can result in amputation if untreated. Biofilm formation by bacteria on the lower limb arises from reduced peripheral arterial blood flow, which can lead to the failure of antibiotic therapy or require longer intravenous antibiotic therapy. The adjuvant effect of n-acetyl cysteine (NAC) on inpatients with osteomyelitis who were treated with systemic antibiotics was evaluated in the current study.

**Methods and Materials:** This randomized trial was conducted on patients with diabetic foot osteomyelitis (DFO) with grade III or IV Wagner who were hospitalized to receive injectable antibiotics. Patients (n = 56) were treated with 600 mg of NAC twice daily for two weeks or assigned to the control group. Laboratory data, including white blood cells with differentiation and inflammatory factors (erythrocyte sedimentation rate [ESR] and C-reactive protein [CRP]), were measured at baseline (time 0) after one week and three weeks of initiating the intervention.

**Results:** Fifty-three eligible patients completed the study. All evaluated infectious-related parameters showed significant changes and reductions in patients who received NAC compared to the control group ( $p = 0.05$ ), except for lymphocyte proportion and neutrophil to lymphocyte ratio ( $p = 0.11$  and  $0.84$ , respectively). The change rate of ESR and CRP in NAC in comparison to the control was statistically significant at the end of the study ( $-49.44 \pm 6.04$  vs.  $-7.17 \pm 3.99$ ;  $-44.43 \pm 4.21$  vs.  $-14.02 \pm 4.05$ , respectively;  $p = 0.05$ ).

**Conclusion and Discussion:** As observed in this study, oral NAC 600 mg twice daily is effective in the treatment protocol of patients with DFO to optimize antibiotic responses and accelerate the trend of reduction in infectious inflammatory markers during therapy.

**Keywords:** Acetylcysteine, Infections, Osteomyelitis

