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Effect of nerolidol on cyclophosphamide-induced bone marrow and hematologic toxicity in Swiss albino mice

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Highlights

- Administration of cyclophosphamide (200 mg/kg, intraperitoneal) induces marked hematotoxicity, myelotoxicity, oxidative stress, inflammation, and histologic aberrations in femoral bone marrow of Swiss albino mice.
- Nerolidol was evaluated for its myeloprotective and hematoprotective potential in cyclophosphamide-induced myelotoxic mice.
- Administration of nerolidol ameliorated cyclophosphamide-induced hematotoxicity, myelotoxicity, oxidative stress, inflammation, and histologic aberrations in femoral bone marrow of Swiss albino mice.

Cyclophosphamide (CP) is one of the commonly used anticancer drugs, but its use is limited by myelotoxicity. Nerolidol (NER) is a lipophilic, bioactive sesquiterpene reported to have neuroprotective, cardioprotective, gastroprotective, and renal protective potential, but its myeloprotective potential is underexplored. This study was aimed at evaluating the myeloid-protective potential of NER in CP-induced myelotoxic mice. NER 200 and 400 mg/kg was given orally from the first to the 14th day. CP 200 mg/kg was administered intravenously on the seventh day. At the end of the study, mice were humanly killed, and blood and bone marrow were collected ored for hematologic, biochemical and histopathologic estimations. Bone marrow analysis ed d bone marrow cellularity, α-esterase activity, colony-forming unit granulocyte–macrophag U-(

levels, colony-forming unit erythroid (CFU-E) levels, and burst-forming unit-erythroid (BFU-E) levels. Hematologic findings revealed reduced peripheral blood count and granulocyte-colony stimulating factor (G-CSF) levels, whereas biochemical analysis revealed increased malondialdehyde (MDA), tumor necrosis factor α (TNF-α), interleukin (IL)-6, and IL-1β levels and reduced superoxide dismutase (SOD), catalase (CAT), and IL-10 levels. Histopathologic study further strengthened our findings. Treatment with NER significantly reversed the hematotoxic and myelotoxic aberrations and retained the structural integrity of bone marrow. Findings of the current study suggest that NER is a potential therapeutic molecule that can mitigate CP-induced hematotoxic and myelotoxic manifestations. However, more detailed studies are needed to explicate the mechanism underlying its protective effect.

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