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# Ameliorative Effect of Nerolidol on Cyclophosphamide-Induced Gonadal Toxicity in Swiss Albino Mice: Biochemical-, Histological- And Immunohistochemical-Based Evidences

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## Abstract

Cyclophosphamide (CP) is commonly used as antineoplastic and immunosuppressant drug with noticeable gonadotoxic profile. Nerolidol (NER) is a sesquiterpene with potent antioxidant and anti-inflammatory properties. Thus, the present study was designed to explore its possible gonadal protective potential against cyclophosphamide-induced testicular, epididymal, seminal and spermatozoal toxicities. Animals were ...ve groups: control (normal saline for 14 days), treatment group (NER 200 and 40... ...ng with a single dose of cyclophosphamide (200 mg/kg, i.p) on 7th day, toxic an... groups (cyclophosphamide 200 mg/kg i.p) on 7th day and NER 400 mg/kg for 14 days respe... were sacrificed on the 15 day, and body weight, weight of reproductive organs, testosterone...

count, biochemical parameters, histopathological and immunohistochemical studies were performed in the testes, epididymis and in the serum. CP administration induced oxidative stress, nitrative stress, inflammation, reduced testosterone level, sperm count, increased expression of MPO and caused histological aberrations in the testes, epididymis and seminal vesicles. CP caused reduced sperm count, sperm motility and testosterone level which got reversed upon treatment with nerolidol in a dose-dependent manner. Nerolidol thus acted as a gonadoprotective molecule and prevented the gonadotoxicity of CP.

**Keywords:** adjuvant therapy; chemotherapy; myeloperoxidase; testicular inflammation; testosterone.



## Nerolidol Attenuates Cyclophosphamide-Induced Cardiac Inflammation, Apoptosis and Fibrosis in Swiss Albino Mice

A Iqubal et al. Eur J Pharmacol 863, 172666. 2019. PMID 31541628.

Incidence and prevalence of cancer is an alarming situation globally. For the treatment of cancer many anticancer drugs have been developed but, unfortunately, their pote ...

## Nerolidol Ameliorates Cyclophosphamide-Induced Oxidative Stress, Neuroinflammation and Cognitive Dysfunction: Plausible Role of Nrf2 and NF- κB

A Iqubal et al. Life Sci 236, 116867. 2019. PMID 31520598.

Findings of the study suggested that NER is a potential therapeutic molecule which can mitigate CP-induced neurotoxic manifestations via Nrf2 and NF-κB pathway. However, ...

## Dacarbazine Induces Genotoxic and Cytotoxic Germ Cell Damage With Concomitant Decrease in Testosterone and Increase in Lactate Dehydrogenase Concentration in the Testis

SG Kumar et al. Mutat Res 607 (2), 240-52. 2006. PMID 16793327.

Treatment of cancers with cytotoxic agents such as alkylating drugs often, but not always results in transient to permanent testicular dysfunction. The present study was ...

## Astaxanthin Inhibits Cytotoxic and Genotoxic Effects of Cyclophosphamide in Mice Germ Cells

DN Tripathi et al. Toxicology 248 (2-3), 96-103. 2008. PMID 18485558.

Cyclophosphamide (CP), an alkylating agent used in the treatment of several cancers as well as an immunosuppressant in rheumatoid arthritis. It is used against several ca ...

## Protective Effect of Diallyl Disulfide on Cyclophosphamide-Induced Testicular Toxicity in Rats

SH Kim et al. Lab Anim Res 29 (4), 204-11. Dec 2013. PMID 24396385.

This study investigated the protective effects of diallyl disulfide (DADS) against cyclophosphamide (CP)-induced testicular toxicity in male rats. DADS was gavaged to rat ...

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Iqubal A, et al. Life Sci 2019.

**Nerolidol** (NER) is a lipophilic bioactive molecule with antioxidant and anti-inflammatory properties but it has not been explored for neuroprotective potential in CP-induced neurotoxic manifestations. ...

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

Iqubal A, et al. Exp Hematol 2020.

**Nerolidol** (NER) is a lipophilic, bioactive sesquiterpene reported to have neuroprotective, cardioprotective, gastroprotective, and renal protective potential, but its myeloprotective potential is underexplored. ...