
Chemoprotective action of septilin Against Cyclophosphamide Toxicity

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Oral administration of septilin was found to protect mice from cyclophosphamide-induced leukopenia. Total leukocyte counts in Septilin treated animals on day 12 were 2400 cells/mm³ which was significantly higher ($p < 0.005$) compared to controls (700 cells/mm³) and reached the base line value on day 16 (12,000 cells/mm³). The bone marrow cellularity was also significantly higher compared to controls. There was no change in the hemoglobin levels in septilin treated animals. Moreover, Septilin treatment prevented the loss of body weight and reduced the mortality in mice treated with cyclophosphamide. This indicates the usefulness of Septilin in chemotherapy-induced leukopenia.

EARLY revival of immune function in cancer patients, is of great importance for the successful control and protection from life threatening secondary infections resulting from immunosuppression¹. Hence the use of immunopotentiating agents along with other modalities of cancer treatment to restore the compromised immunologic system, has been suggested².

Septilin³ is a proprietary herbomineral preparation made by the Himalaya Drug Company, Bombay. It is widely used in various acute and chronic infections and the mechanism of action of this preparation appears to be through increased phagocytic activity (4). We have previously shown that Septilin administration could increase the total count of WBC as well as the percentage of polymorphs in the peripheral circulation in mice⁵.

Presently, we report the chemoprotective effect of Septilin towards cyclophosphamide (CYP) toxicity in mice.

MATERIALS AND METHODS

Septilin powder was supplied by the Himalaya Drug Company, Bombay. CYP (Endoxan) was pur-

chased from Khandelwal industries, Bombay. Swiss albino mice were purchased from Virology Department, CMC, Vellore.

Two groups of animals (7 per group) were used in this experiment. One set, which served as controls, received CYP (50 mg/kg) daily for 14 days intraperitoneally and the other group received CYP and 0.75 ml of hot water extract of Septilin equivalent to 100 mg of Septilin powder orally for 14 days. Various parameters such as total count (TC) of WBC (hemocytometer), hemoglobin levels (Drabkins method), body weight, and mortality were monitored on various days.

In a similar experiment, mice (3 per group) were sacrificed on day 15 and the femurs were removed. The bone marrow was flushed out of the femur using 25 G needle and a syringe. Total live cells were counted using a hemocytometer.⁶

STATISTICS

Statistical significance were determined using Student 't' test and was determined at a level $P < 0.005$.

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RESULTS

Septilin administration improved the total count of WBC in animals treated with CYP (Fig. 1). Total leukocyte count in control animals (CYP alone) on day 12 were 700 cells/mm³ and reached the base line value on day 21 (9500 cells/mm³). In the case of Septilin-treated group, on day 12 the total count of leukocytes were 2400 cells/mm³ and reached the base line value on day 16 (12,000 cells/mm³) which is highly significant.

Animals treated with CYP alone showed a slight decrease in hemoglobin levels (8.75 g% on day 9). But in the Septilin-treated group the hemoglobin levels were maintained at a steady level through out the experiment (Fig. 2)

Moreover, there was a significant decrease in body weight of animals treated with CYP alone (Fig. 3). On day 15, a loss of body weight by 27% was observed in control animals, but only 13% loss was found in the septilin-treated group, which was significant. Survival of the animals also increased in the group treated with CYP and Septilin (Table I). On day 30, none of the control animals survived, while 57% of the Septilin-treated group survived for more than 60 days.

Bone marrow cellularity of CYP-treated animals were found to be higher compared to controls in Septilin-treated groups (Table II). On 15th day the number of bone marrow cells in control animals were 0.72x10⁶ cells/femur and in Septilin-treated groups the number of cells were 1.36 x 10⁶ cells/femur which was found to be significant.

DISCUSSION

Septilin is a herbomineral drug preparation that has been shown to possess immunomodulatory activity⁵. It has been shown that the administration of Septilin improved the total count of leukocytes as well as the percentage of neutrophils in normal mice⁵. There are reports available to show that Septilin

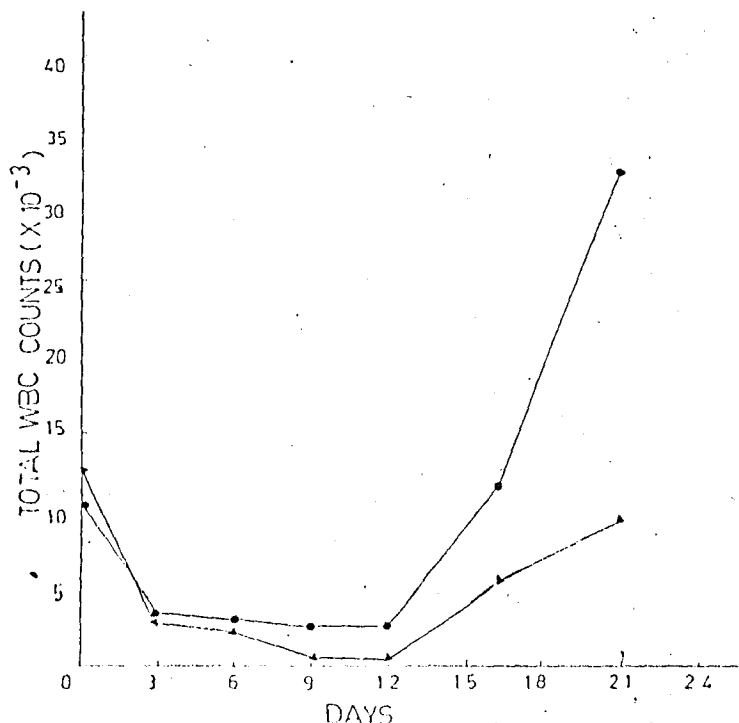


Fig.1: Effect of Septilin on the WBC count in mice treated with CYP

Δ - Δ CYP alone, ○ - ○ CYP and Septilin treated

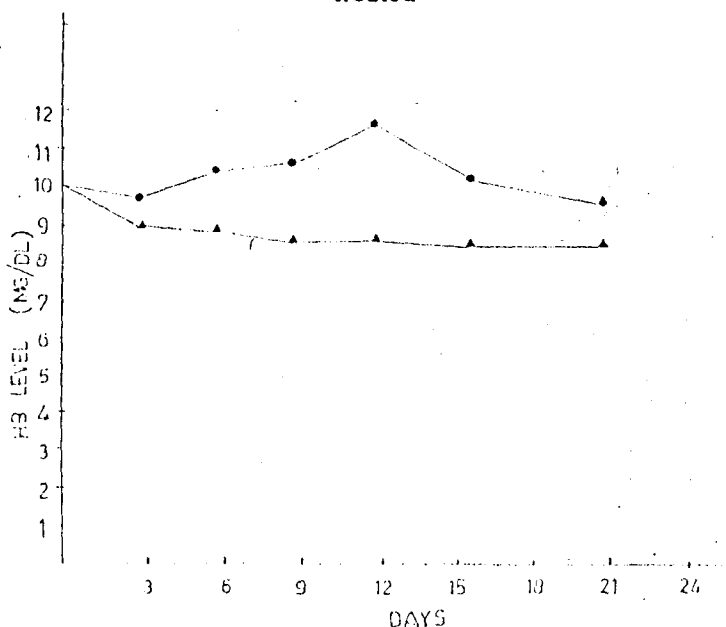


Fig. 2: Effect of Septilin on the hemoglobin levels in mice treated with CYP

Δ - Δ CYP alone, ○ - ○ CYP and Septilin

improved phagocytosis.⁴ Moreover, we have previously shown that the tumour reducing property of Septilin was mainly due to its immunostimulant properties.⁵ In the present report we have determined its protective effect during CYP treatment in mice.

Table I: Effect of Septilin on the Survival of animals treated with CYP

Treatment	Days	10	15	20	25	30	40	60	% mortality
Control Cyclophosphamide		5/7	5/7	2/7	2/7	2/7	0/7	0/7	100
Septilin + Cyclophosphamide		7/7	7/7	6/7	5/7	4/7	4/7	4/7	42%

Table II: Effect of Septilin on Bone marrow cellularity of CYP treated mice

Treatment	No. of cells/ femur (x 10 ⁻⁶)
Control	0.72 ± 0.29
Septilin	1.36 ± 0.08*

*P < 0.005

These experiments indicate that administration of Septilin may partially reduce the CYP-induced toxicity and could be used as an adjuvant in cancer therapy.

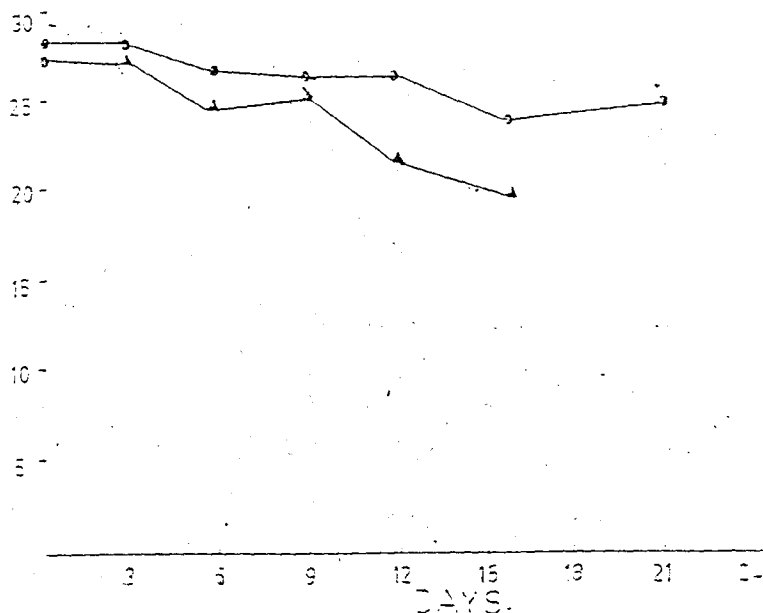


Fig. 3: Effect of Septilin on the body weight of mice treated with CYP

Δ - Δ CYP alone, O - O CYP and Septilin

Total leukocyte counts in CYP-treated animals were significantly increased by oral Septilin administration. This increase could be observed 48 hr after the completion of the CYP treatment which is highly significant. Moreover, the number of bone marrow cells were significantly high in Septilin-treated groups when compared to controls indicating that Septilin administration positively increased the regeneration of WBC. The hemoglobin levels were maintained at a steady level through out the experiment in Septilin-treated animals. Septilin also had a significant effect in reducing the loss of body weight as well as improving the survival of CYP-treated mice.

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