

Stimulation of Cellular Immunity by IMMBO in Experimental Models



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Introduction

Delayed-type hypersensitivity (DTH) is a hallmark of cell-mediated immunity, involving the activation of CD4+ T-helper cells, macrophages, and the release of cytokines. This response is critical for immune surveillance and is often impaired in immunosuppressed conditions, such as those induced by cyclophosphamide.

IMMBO, a standardized herbo-mineral Ayurvedic formulation derived from Ras Shastra, has shown promise in enhancing immune functions. This study focuses on assessing the impact of IMMBO on DTH responses in cyclophosphamide-induced immunosuppressed rats.

Materials and Methods

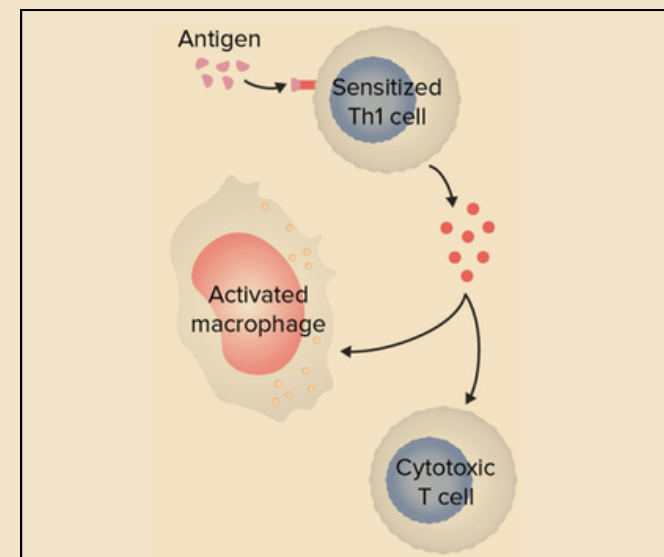
Animal Model and Experimental Design

- Subjects:** Healthy Wistar albino rats (6-8 weeks old)
- Immunosuppression:** Induced by a single intraperitoneal injection of cyclophosphamide (100mg/kg) on Day 0.
- Sensitization:** Rats were injected with 0.1mL of SRBC into the right hind footpad to sensitize them; the left footpad received a PBS injection as control.
- Booster and Treatment:** On Day 7, a booster dose of SRBC was administered to elicit the DTH response.

- Treatment Groups:**
 - Control:** Received saline.
 - Cyclophosphamide Alone:** Received no further treatment.
 - Reference Group:** Received Levamisole (20mg/kg, orally)
 - IMMBO Group:** Received IMMBO at 800mg/kg (orally).

Assessment of DTH Response

- On Day 14, footpad thickness was measured using a Vernier caliper on both the antigen-challenged (right) and control (left) hind paws.
- The DTH response was quantified as the difference in thickness between the challenged and control footpads.



Results

- Enhanced Footpad Swelling:** IMMBO-treated rats showed a significant increase in footpad thickness compared to the cyclophosphamide-only group, indicating a robust DTH response.
- Comparable to Levamisole:** The magnitude of the DTH response in the IMMBO group was comparable to that in the Levamisole-treated group, demonstrating that IMMBO effectively restores cellular immunity even under immunosuppressive conditions.

Discussion

The enhanced DTH response in IMMBO-treated rats suggests that IMMBO stimulates the cell-mediated arm of the immune system. The observed increase in footpad swelling indicates improved activation of T-cells and macrophages-key players in DTH reactions.

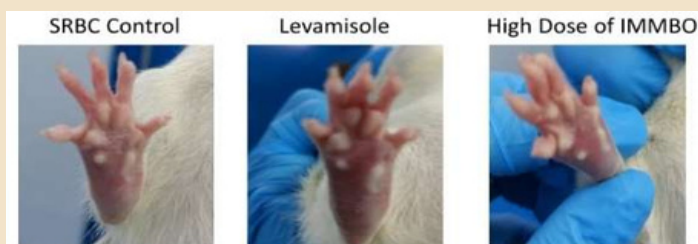
These results are significant in an immunosuppressed setting induced by cyclophosphamide, highlighting IMMBO's potential to bolster immune surveillance and cellular immunity.

Conclusion

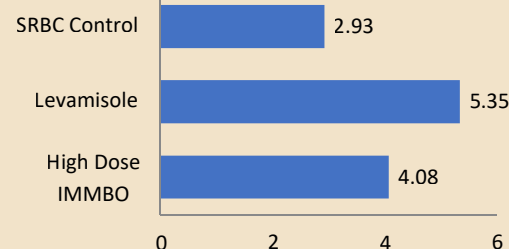
IMMBO significantly enhances the delayed-type hypersensitivity response in cyclophosphamide-induced immunosuppressed rats.

By restoring cellular immune function, IMMBO demonstrates promising therapeutic potential for conditions characterized by compromised cellular immunity.

Fig: Outcome of the delayed type hypersensitivity study; IMMBO group showed better control of hypersensitivity response



Mean increase in paw thickness (in mm)



References

- Huber B, Devinsky O, Gershon RK, Cantor H. Cell-mediated immunity: delayed-type hypersensitivity and cytotoxic responses are mediated by different T-cell subclasses. *J Exp Med.* 1976 Jun 1;143(6):1534-9. | 2. Prakash VB, Sati ST, Rao YK, Prakash S, Negi N. Immunomodulatory Effects of a Herbo-Mineral Ayurvedic Formulation in Experimental Models. *Cureus.* 2024;16(4):e58913.

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