HSR London International Conference on Multidisciplinary Academic Research
(HSR-ICMAR) 2026
https://houghtonstreetreview.com/index.php/conference

IMMUNOHISTOCHEMICAL EVALUATION OF THE EFFECT OF SILYBUM MARIANUM OIL ON CD3 EXPRESSION IN THE LYMPH NODES OF OUTBRED WHITE RATS

M.M.Malikov
Independent Researcher, Bukhara State Medical Institute
E-mail: Mirik.malikov.93@mail.ru

Abstract: This study investigated the effect of biocorrection with Silybum marianum (milk thistle) oil on CD3 marker expression in the lymph nodes of 3-, 6-, and 12-month-old outbred white rats using an immunohistochemical approach. The findings demonstrated that biocorrection enhanced T-lymphocyte activity, increased the number of CD3-positive cells, and preserved the morphofunctional integrity of the lymph nodes. Although these changes were observed in all age groups, their intensity varied according to age. A pronounced increase in CD3-positive T lymphocytes within the paracortical zone confirmed the activation of the cellular immune response. The obtained results provide morphological and immunohistochemical evidence supporting the immunomodulatory properties of Silybum marianum oil and indicate its potential application as an effective biocorrective agent.

Keywords: CD3, immunohistochemistry, lymph node, T lymphocyte, Silybum marianum, biocorrection, outbred white rats, paracortical zone, immunity.

Introduction: CD3 is considered one of the principal immunohistochemical markers for evaluating the functional status of T lymphocytes in lymph nodes. The assessment of immune system alterations induced by naturally occurring biologically active compounds represents an important area of contemporary experimental morphology. In recent years, increasing attention has been directed toward plant-derived bioactive substances because of their immunomodulatory potential. Among these, Silybum marianum oil has attracted particular interest owing to its antioxidant, membrane-protective, and immunomodulatory properties. Therefore, the present study aimed to evaluate the effect of Silybum marianum oil on the T-lymphocyte component of rat lymph nodes.

Materials and Methods: The study was conducted on 3-, 6-, and 12-month-old outbred white rats. The animals were divided into experimental groups and groups receiving biocorrection with Silybum marianum oil. Lymph node specimens were processed for immunohistochemical detection of the CD3 marker. The level of CD3 expression and the distribution of T lymphocytes within the paracortical region and other anatomical compartments of the lymph nodes were comparatively evaluated.

Results: Following biocorrection, 3-month-old rats demonstrated a marked increase in the number of CD3-positive cells within the paracortical zone, accompanied by enhanced T-lymphocyte expression in the germinal centers and interfollicular areas. These findings indicate activation of the cellular immune response in the lymph nodes. In the 6-month-old animals, CD3 expression remained consistently high. The zonal architecture of the lymph nodes was largely preserved, whereas the increased density of T lymphocytes within the paracortical region confirmed the immunomodulatory effect of biocorrection. In addition, the morphofunctional stability of the lymph nodes was maintained.

Biocorrection also exerted a beneficial effect in 12-month-old rats. Despite age-related alterations, high CD3 expression, increased T-lymphocyte activity in the paracortical zone, and an elevated number of immunocompetent cells in the germinal centers indicated an improvement in immune function. Immunohistochemical staining demonstrated that CD3-positive cells were predominantly localized within the paracortical region. Compared with the untreated experimental animals, the biocorrected groups exhibited stronger immunoreactivity and better preservation of lymph node architecture. Active

accumulation of T lymphocytes around the germinal centers suggested enhanced functional interactions among immunocompetent cells. Although a slight age-related decline in CD3 expression was observed, treatment with Silybum marianum oil mitigated these changes and contributed to maintaining a relatively stable pattern of expression. Comparative analysis demonstrated that biocorrection improved the immunomorphological status of the lymph nodes and played an important role in preserving T-lymphocyte-mediated immune activity.

Conclusions

1. Biocorrection with Silybum marianum oil enhanced CD3 expression in the lymph nodes of all age groups.
2. Biocorrection significantly increased the density of T lymphocytes and the number of CD3-positive cells within the paracortical zone.
3. Increased activity of immunocompetent cells in the germinal centers and interfollicular regions indicated enhanced cellular immune responses.
4. In 12-month-old rats, the immunomodulatory effect of biocorrection was maintained, with high CD3 expression despite age-related changes.
5. The obtained findings demonstrate that Silybum marianum oil effectively preserves the morphofunctional integrity of lymph nodes and enhances T-lymphocyte-mediated immunity, supporting its potential use as a promising biocorrective agent.

References

1. Кононова С.В., Т.Я. Вахитов, И.В. Кудрявцев [и др.] Цитокиновый профиль и иммунологический статус у пациентов с язвенным колитом // Вопросы практической педиатрии. - 2021.
2. Краюшкин А. И. и др. Закономерности морфологии висцеральных лимфатических узлов, принимающих лимфу от различных органов и регионов тела //Вестник Волгоградского государственного медицинского университета. – 2018
3. Климов, В.А. Диагностика и лечение язвенного колита / В.А. Климов // Справочник врача общей практики. - 2019.
4. Князев О.В., А.В. Каграманова, М.Е. Чернова [и др.] Clostridium difficile при воспалительных заболеваниях кишечника // Терапевтический архив. - 2018.