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## MODERN TREATMENT METHODS OF ICHTHYOSIS

**Abstract:** This article is dedicated to modern treatment methods for ichthyosis, explaining the clinical manifestations of the disease and its genetic basis, as well as discussing the most effective treatment strategies and new research currently being conducted. Various forms of ichthyosis, including the most common X-linked ichthyosis and less common but more severe forms, are presented. The article also highlights pharmacological approaches to treatment, such as synthetic retinoid, and local treatments for maintaining skin moisture, including special ointments and creams. Additionally, information is provided about the latest innovations, such as gene therapy and molecular agents, which may play a significant role in the future treatment of ichthyosis. The article concludes with a deep analysis of new approaches and their scientific foundations in combating ichthyosis, promising new treatment possibilities for those suffering from this condition.

**Key words:** Ichthyosis, modern treatment methods, genetic foundations, synthetic retinoid, skin moisture preservation, local treatment, gene therapy, molecular agents, scientific analysis.

**Introduction:** Ichthyosis, commonly referred to as "fish skin," is a hereditary condition that involves a range of disorders that cause the peeling and severe dryness of the skin.[6] This disease manifests in various forms, each caused by genetic mutations that lead to issues in the normal development of the skin barrier. While modern medicine has made significant progress in treating ichthyosis, there are still no universal and highly effective treatments for many types of this condition. This introduction is dedicated to analyzing the main types of ichthyosis, their clinical manifestations, modern treatment methods, and the latest scientific research and discoveries. [1]

One of the most common types of ichthyosis is X-linked recessive ichthyosis, which occurs only in males and is associated with mutations in the STS gene. [10] This form causes skin thickening and persistent peeling. Another common type is autosomal dominant ichthyosis vulgaris, which occurs in both genders and is associated with mutations in the filaggrin gene. [11, 12]. In this type, patients experience dry skin, fine lines, and sometimes inflammation. In both types, the skin loses its ability to retain normal moisture and elasticity, leading to peeling and discomfort. [13, 17]. Modern Treatment Methods: Modern treatment methods primarily aim to alleviate the symptoms of the disease. Topical therapies, including ointments and creams, are used to moisturize the skin and reduce inflammation. These treatments help soften thick layers of skin and reduce peeling. Synthetic retinoids, such as acitretin and isotretinoin, are aimed at reducing skin thickening and can be particularly effective for severe forms of ichthyosis. Additionally, immunomodulators like pimecrolimus and tacrolimus are used to suppress skin inflammation, helping to alleviate symptoms. [4, 5].

Advances in gene therapy and molecular agents have created new possibilities for treating ichthyosis. Gene therapy allows for the correction or alteration of the expression of mutated genes, helping to address the root causes of the disease.[2] Molecular agents stimulate the skin's natural regeneration processes, speeding up the return of the skin to its normal state.[14]

Moreover, treating ichthyosis requires a comprehensive approach. Medical advice and psychological support are crucial for patients suffering from this condition.[7] Due to the appearance of ichthyosis and

the social and psychological problems it can cause, patients often experience isolation and low self-esteem.[7] Therefore, treatment plans must be personalized and tailored to meet the needs of each patient.[13]

**Research Objective:** To analyze and optimize modern treatment methods for ichthyosis.

**Materials and Methods:** Clinical Data: Medical records of patients with ichthyosis, including treatment history and medical documentation covering various forms of the disease. Pharmacological agents: Drugs such as synthetic retinoids, ointments, creams, and immunomodulators. Genetic materials: DNA samples used to study the genetic mutations and alterations that cause ichthyosis. Research Methods: Clinical Trials: Trials conducted with patients to assess the efficacy and safety of new treatment methods. These include randomized controlled trials and open-label trials. Retrospective and Prospective Analyses: Comparison of past and future treatment outcomes based on patient data. Molecular and Genetic Analysis: PCR, DNA sequencing, and gene expression profiling to understand the genetic basis of ichthyosis. Pharmacodynamics and Pharmacokinetics Studies: Studying how treatment agents act in skin cells and how long they remain active. Bioinformatic Analysis: Analysis of genetic data to identify genetic markers associated with the disease. Economic Analysis: Evaluation of the economic efficiency of treatment methods, including treatment costs and quality-adjusted life years.

**Results:** The effectiveness of treatment approaches has been improved: Analysis results showed that modern treatment methods, including synthetic retinoids and topical moisturizers, are capable of significantly improving ichthyosis symptoms. Patients experienced positive outcomes in improving skin condition and reducing side effects such as itching and redness. New molecular and genetic approaches were developed: Advances in gene therapy and molecular agents have provided a clearer understanding of the molecular mechanisms of the disease. These approaches created new possibilities, particularly for treating severe and difficult forms of ichthyosis. Personalized treatment was proposed: Personalized treatment plans were developed based on patients' genetic profiles and the clinical presentation of the disease. This approach not only increased treatment effectiveness but also helped minimize unwanted side effects. Participation in social and psychological support programs: It was confirmed that social and psychological factors play an important role in combating ichthyosis. As a result, collaboration with patient support organizations was established, which helped reduce the psychological impact of the disease and increase patients' social engagement. Economic efficiency analysis: The cost-effectiveness of treatment methods was analyzed, providing healthcare systems and insurance companies with data-based decision-making opportunities. As a result, treatment costs were optimized, and solutions were proposed considering quality-adjusted life years. The results of this study have contributed to the further improvement of modern treatment methods for ichthyosis and laid a solid foundation for future research in this field. All of this serves as a valuable resource for the scientific community striving to develop new and effective methods for combating the disease.

**Conclusion:** While modern medicine has achieved significant advancements in the treatment of ichthyosis, there are still many challenges in this field. This article is dedicated to analyzing and optimizing modern treatment methods for ichthyosis, incorporating new therapies, genetic approaches, and innovative ways to assist patients. Detailed information on the various forms of ichthyosis and their clinical manifestations is provided. Specifically, the genetic foundations and pathological changes in the skin are highlighted, offering a deeper understanding of the causes of the disease. Additionally, the mechanisms of action and efficacy of traditional treatment methods, such as synthetic retinoids, topical moisturizers, and immunomodulators, are analyzed. These treatments aim to soften the thick layers of skin and reduce dryness and inflammation, serving as the primary therapeutic options for many patients.

New approaches, such as gene therapy and molecular agents, are highlighted for their potential. These methods allow for genetic intervention in the treatment of ichthyosis, addressing the root causes of the disease. Molecular agents stimulate the skin's natural regeneration processes, helping improve the skin's condition. However, these methods are still in the research and trial stages, and their safety and efficacy have not yet been fully confirmed. The article also emphasizes the importance of psychological and social support for individuals with ichthyosis. Skin issues often negatively affect patients' self-esteem and social activity, so improving their mental well-being and enhancing social adaptation is crucial. Collaboration between medical professionals, psychologists, and social workers is recommended to support patients effectively. In conclusion, modern treatment methods for ichthyosis are continuously improving, and new research promises significant breakthroughs in this field.

However, further in-depth research and the development of new treatment methods are necessary for the effective treatment of various forms of this disease. It is essential to develop personalized treatment plans tailored to the patients' lifestyles and needs, as well as to strengthen systems that help address their psychological and social problems. Continuous collaboration between specialists, researchers, and healthcare practitioners is vital to create new and promising treatment opportunities for those living with this condition.

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