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A Review of the Systemic Impacts of Isotretinoin in People with Acne

Abstract

Acne vulgaris is a common chronic inflammatory disease of the pilosebaceous unit, which comprises the hair follicle, sebaceous gland, and arrector pili muscle. Acne can lead to significant physical and psychological morbidity, including scarring and reduced quality of life. For severe or treatment-resistant cases, systemic isotretinoin (13-cis-retinoic acid) is the gold standard treatment due to its ability to target multiple pathogenic factors, including sebum production, follicular hyperkeratinization, inflammation, and Cutibacterium acnes proliferation. A comprehensive literature search was conducted using databases such as PubMed, Google Scholar, ScienceDirect, and ResearchGate. The systemic effects of isotretinoin on hematological, inflammatory, and oxidative stress biomarkers highlight its broad impact on the body. While the drug's anti-inflammatory properties are beneficial for acne treatment, its effects on oxidative stress and hematological parameters may pose risks, particularly in susceptible individuals. The observed reduction in neutrophil and RBC counts, along with elevated platelet counts and Hb levels, suggests that isotretinoin influences multiple hematological pathways. Similarly, the reduction in IL-8 and elevation in CRP levels underscore its complex role in modulating inflammation. The increase in MDA and decrease in TAS levels indicate that isotretinoin may disrupt the balance between oxidative stress and antioxidant defenses, potentially contributing to its adverse effects. Systemic isotretinoin therapy is highly effective for severe acne but is associated with significant systemic effects on hematological, inflammatory, and oxidative stress biomarkers. Future research should focus on elucidating the mechanisms underlying these changes and identifying strategies to mitigate adverse effects while preserving the drug's therapeutic benefits.