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Prevalence and Patterns of Dermatological Conditions in the Himachali Population: A Cross-Sectional Study

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ABSTRACT

Dermatological conditions are prevalent across various regions of India, with unique patterns influenced by geographic, environmental, and socio-cultural factors. The Himachali population, residing in the mountainous terrain of northern India, experiences a distinct set of dermatological issues due to high-altitude UV exposure, cold weather, and traditional practices. This cross-sectional study aims to assess the prevalence and patterns of dermatological conditions in this population, highlighting common conditions such as melasma, eczema, and xerosis. The study also discusses potential environmental and genetic factors contributing to these conditions and offers insights into culturally specific treatment strategies.

Keywords: Dermatology, Himachali population, skin disorders, UV exposure, cold weather, prevalence, genetic predisposition.

INTRODUCTION

Himachal Pradesh, a northern state of India, is characterized by its high-altitude terrain, varied climate, and cultural diversity. The population of this region, referred to as the Himachali population, is exposed to unique environmental stressors such as intense UV radiation due to higher altitudes, extreme temperature variations, and low humidity. These factors significantly influence the skin health of the inhabitants. However, dermatological research specific to the Himachali population remains limited. While some common dermatological conditions like eczema and xerosis are well-documented in temperate regions, the combination of environmental conditions and genetic predispositions in Himachal Pradesh presents a distinct clinical challenge. This study seeks to fill the research gap by examining the prevalence and patterns of skin conditions in the Himachali population.

MATERIALS AND METHODS

Study Design and Population

This was a cross-sectional study conducted between January and June 2023 in various villages of Solan(Himachal Pradesh). A total of 1,000 participants from different age groups, occupations, and socioeconomic backgrounds were randomly selected for dermatological screening.

Data Collection

Data was collected through dermatological examinations, along with structured interviews focusing on lifestyle, occupation, and family history of skin diseases. Environmental factors such as altitude, UV exposure, and local climate were also recorded.

Inclusion and Exclusion Criteria

Participants included permanent residents of Himachal Pradesh with dermatological complaints or conditions diagnosed within the last six months. Those with systemic diseases known to affect skin health (e.g., diabetes, autoimmune disorders) were excluded from the study to focus on primary dermatological conditions.

Statistical Analysis

Descriptive statistics were employed to calculate the prevalence of each dermatological condition. Chi-square tests were used to assess the association between demographic variables (age, sex, occupation) and specific skin conditions.

Multivariate logistic regression was employed to identify independent predictors of skin disorders within the population.

RESULTS

Demographic Characteristics

The study population consisted of 1,000 individuals: 58% male and 42% female, with a mean age of 35.2 years (range: 12-70 years). The majority of participants were involved in outdoor occupations such as farming (42%), tourism (18%), and construction (15%), with a significant proportion reporting prolonged exposure to the sun and cold weather.

Prevalence of Dermatological Conditions

1. **Xerosis (Dry Skin)**:
   Xerosis was the most prevalent condition, affecting 38% of the population, particularly during the winter months. This condition was most commonly seen in individuals aged over 40, with symptoms worsening at higher altitudes where humidity levels were lower.
2. **Melasma**:
   Melasma, particularly in women, affected 22% of participants, with a higher incidence in individuals aged 30-50. This condition was strongly associated with increased UV exposure due to outdoor occupations and inadequate use of sun protection. Dermoscopy of melasma in this population revealed diffuse brown pigmentation and reticular patterns consistent with sun-induced melanin deposition.
3. **Eczema (Atopic Dermatitis)**:
   Eczema was diagnosed in 18% of the participants, with a higher prevalence in children and adolescents. Familial clustering was observed, suggesting a genetic predisposition in certain families. Additionally, the condition was aggravated by cold weather and dry air, which exacerbated skin barrier dysfunction.
4. **Chilblains (Pernio)**:
   Pernio or chilblains, characterized by painful, red, or purple skin lesions caused by exposure to cold, was observed in 12% of participants, primarily those living at altitudes above 2,000 meters. Symptoms typically appeared during winter and were more common in farmers and outdoor laborers.
5. **Actinic Keratosis**:
   Actinic keratosis, a precursor to skin cancer caused by prolonged UV exposure, was diagnosed in 7% of participants, primarily those over the age of 50. This condition was more prevalent in individuals with lighter skin types (Fitzpatrick III) and those working in outdoor environments.
6. **Vitiligo**:
   Vitiligo, an autoimmune condition resulting in depigmented patches of skin, affected 5% of the study population. Interestingly, a strong familial occurrence of vitiligo was noted, suggesting a genetic component in its pathogenesis. Participants reported significant psychosocial impacts, particularly in rural areas where traditional beliefs about skin conditions persist.

ENVIRONMENTAL AND GENETIC FACTORS

UV Exposure:
Participants living at higher altitudes (>2,500 meters) showed an increased prevalence of UV-related skin conditions such as melasma and actinic keratosis. Despite the high risk, only 23% reported regular use of sunscreen or sun-protective clothing, indicating a lack of awareness about skin protection in the population.

Cold Weather and Low Humidity:
Low humidity and freezing temperatures were linked to xerosis, chilblains, and exacerbations of eczema. These conditions were particularly severe in the winter months, with many participants lacking access to adequate moisturizers or protective clothing.

Genetic Predisposition:
A family history of eczema, vitiligo, and melasma was common among participants, pointing to a significant genetic influence. The prevalence of familial eczema and vitiligo was notably higher in certain districts, suggesting a need for further genetic studies in the region.

DISCUSSION

The findings of this study highlight the distinct dermatological profile of the Himachali population, shaped by a combination of environmental factors, occupational exposure, and genetic predisposition. Xerosis and melasma emerged as the most common conditions, primarily driven by environmental stressors such as UV radiation and cold weather. The high prevalence of chilblains and actinic keratosis underscores the importance of raising awareness about skin protection in high-altitude regions.

Melasma and actinic keratosis in this population also reflect the global challenge of skin conditions related to UV exposure. However, the unique occupational and environmental context in Himachal Pradesh—where outdoor work is prevalent—intensifies this risk. Public health interventions, such as educational campaigns on the use of sunscreen and protective clothing, could significantly reduce the burden of UV-related skin conditions.

Eczema and vitiligo, showing strong familial links, suggest that genetic studies targeting these conditions in the Himachali population could provide further insights into their etiology. Addressing the psychosocial impact of dermatological conditions, particularly in rural areas, is equally important, as many participants expressed concern over the stigma associated with visible skin diseases.

CONCLUSION

This cross-sectional study provides the first comprehensive assessment of dermatological conditions in the Himachali population, revealing significant associations with environmental and genetic factors. The high prevalence of xerosis, melasma, and eczema suggests a need for targeted public health initiatives, particularly focusing on skin protection, hydration, and early treatment. Further research into the genetic basis of dermatological conditions in this population is warranted to better understand their pathogenesis and improve therapeutic outcomes.

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