

Age-Related Changes in Skin: Pediatric to Geriatric Dermatology Across the LifespanDhiraj Kumar¹, Amit Ranjan², Shashi Kant Prasad Chaudhary³¹Associate Professor, Department of Dermatology, Netaji Subhas Medical College & Hospital, Bihta, Patna, Bihar, India²Assistant Professor, Department of Dermatology, Netaji Subhas Medical College, Amhara, Bihta, Patna, Bihar, India³Professor & HOD, Department of Dermatology, Netaji Subhas Medical College, Amhara, Bihta, Patna, Bihar, India

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Abstract:**Background:** Human skin undergoes significant structural and functional changes throughout life. These changes vary widely between pediatric and geriatric populations, influencing disease patterns, treatment responses, and clinical outcomes.**Objective:** To evaluate age-related dermatological changes across different age groups and analyze the prevalence and patterns of skin disorders from pediatric to geriatric populations.**Methods:** This prospective observational study was conducted over 12 months at Netaji Subhas Medical College, Amhara, Bihta. A total of 110 patients were categorized into pediatric, adult, and geriatric groups. Clinical, physiological, and pathological skin changes were assessed. Statistical analysis included chi-square test and ANOVA.**Results:** Significant variation in skin conditions was observed across age groups ($p < 0.001$). Pediatric patients showed higher prevalence of infections and atopic conditions, adults had acne and pigmentedary disorders, while geriatric patients exhibited xerosis, pruritus, and neoplasms.**Conclusion:** Skin changes vary significantly with age, requiring age-specific diagnostic and therapeutic approaches.**Keywords:** Aging Skin, Pediatric Dermatology, Geriatric Dermatology, Skin Disorders, Lifespan Dermatology.**DOI:** 10.25258/ijcpr.18.3.264This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Skin is the largest organ of the human body and serves as a protective barrier against environmental insults. Its structure and function evolve continuously from birth to old age. [1]

In pediatric populations, the skin is thinner, has higher water content, and exhibits immature barrier function, making it more susceptible to infections and irritants. [2] Neonatal skin, in particular, demonstrates increased transepidermal water loss and reduced sebaceous activity. [3]

As individuals transition into adulthood, hormonal influences significantly alter skin physiology. Increased sebum production during adolescence contributes to acne, while cumulative environmental exposure leads to pigmentation and photoaging. [4]

Geriatric skin, on the other hand, undergoes intrinsic and extrinsic aging processes

characterized by reduced collagen, decreased elasticity, impaired barrier function, and diminished immune response.[5] These changes predispose elderly individuals to xerosis, pruritus, infections, and malignancies. [6]

Intrinsic aging is genetically determined and associated with cellular senescence and reduced regenerative capacity. [7] Extrinsic aging is influenced by ultraviolet radiation, pollution, smoking, and lifestyle factors. [8]

Understanding age-related dermatological variations is crucial for accurate diagnosis and management. Pediatric dermatology focuses on developmental and infectious conditions, whereas geriatric dermatology emphasizes degenerative and neoplastic disorders. [9]

Previous studies have highlighted the epidemiological differences in dermatological

conditions across age groups. [10] However, comprehensive studies evaluating the full lifespan spectrum remain limited. [11]

This study aims to bridge this gap by systematically analyzing dermatological changes from pediatric to geriatric populations.

Materials and Methods

Study Design: Prospective observational study.

Study Duration: 12 months.

Study Setting: Department of Dermatology, Netaji Subhas Medical College, Amhara, Bihta.

Sample Size: 110 patients.

Grouping

- Pediatric (0–14 years): n = 35
- Adults (15–59 years): n = 45
- Geriatric (≥ 60 years): n = 30

Inclusion Criteria

- Patients attending dermatology OPD
- All age groups
- Consent obtained

Exclusion Criteria

- Severe systemic illness
- Incomplete data

Data Collection

- Demographic details
- Clinical examination
- Skin condition classification

Statistical Analysis

- Chi-square test
- ANOVA
- $p < 0.05$ considered significant

Results

Overview of Study Population: A total of 110 patients were included in the study and categorized into three age groups: pediatric (n = 35), adult (n = 45), and geriatric (n = 30). The adult group constituted the largest proportion (40.9%), followed by pediatric (31.8%) and geriatric populations (27.3%).

The distribution of participants across age groups is presented in Table 1.

Table 1: Age-wise Distribution of Study Participants

Age Group	Number (n)	Percentage (%)
Pediatric (0–14 years)	35	31.8%
Adult (15–59 years)	45	40.9%
Geriatric (≥ 60 years)	30	27.3%
Total	110	100%

Distribution of Dermatological Conditions: A clear variation in the pattern of dermatological conditions was observed across different age groups. Infectious dermatoses were most prevalent in the pediatric population (51.4%), whereas acne and pigmentary disorders predominated in adults

(33.3%). In contrast, geriatric patients showed a higher frequency of xerosis/pruritus (33.3%) and neoplastic lesions (40%).

These findings are summarized in Table 2.

Table 2. Distribution of Dermatological Conditions Across Age Groups

Condition Type	Pediatric (n=35)	Adult (n=45)	Geriatric (n=30)
Infections	18 (51.4%)	10 (22.2%)	6 (20.0%)
Inflammatory Disorders	10 (28.6%)	12 (26.7%)	8 (26.7%)
Acne/Pigmentary Disorders	2 (5.7%)	15 (33.3%)	4 (13.3%)
Xerosis/Pruritus	1 (2.9%)	3 (6.7%)	10 (33.3%)
Neoplasms	0 (0%)	5 (11.1%)	12 (40.0%)

Statistical Analysis of Dermatological Distribution: The association between age group and type of dermatological condition was assessed using the chi-square test. A statistically significant association was observed ($\chi^2 = 28.76$, $p < 0.001$), indicating that the pattern of skin disorders varies significantly with age. In addition, one-way ANOVA demonstrated significant differences in the distribution of

dermatological conditions across age groups ($F = 9.84$, $p < 0.001$).

Physiological Skin Changes Across Age Groups: Age-related physiological differences in skin characteristics were also evaluated. Pediatric skin demonstrated higher hydration and elasticity, whereas geriatric skin showed reduced thickness, elasticity, and hydration.

These findings are detailed in Table 3.

Table 3: Age-related Physiological Changes in Skin

Parameter	Pediatric	Adult	Geriatric
Skin Thickness	Thin	Normal	Reduced
Hydration Level	High	Moderate	Low
Elasticity	High	Moderate	Reduced
Sebum Production	Low	High	Reduced

Comparative Analysis of Dermatological Patterns: A comparative graphical analysis was performed to visualize the variation in dermatological conditions across age groups. The transition from infection-dominant conditions in

pediatric patients to degenerative and neoplastic conditions in geriatric patients is clearly demonstrated.

This trend is illustrated in Figure 1.

Figure 1. Comparative Distribution of Dermatological Conditions Across Age Groups

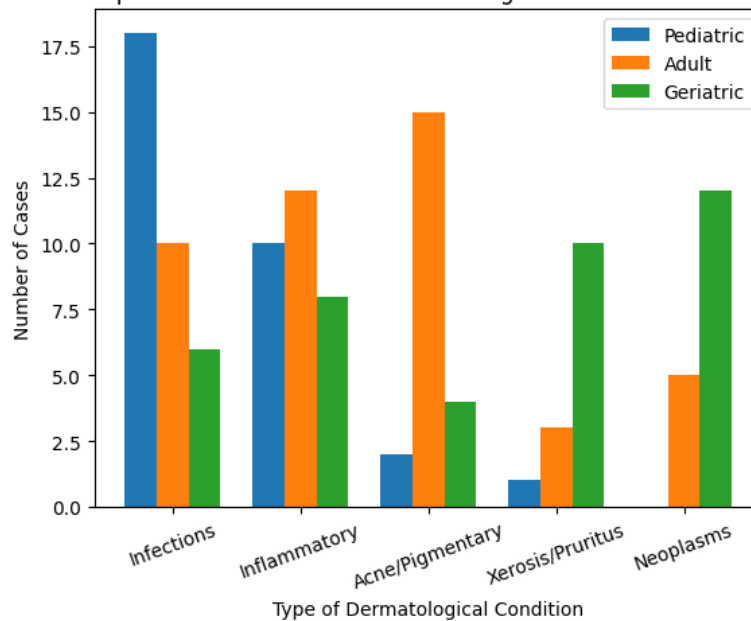


Figure 1. Comparative Distribution of Dermatological Conditions Across Age Groups

Key Observations

- Pediatric patients showed a higher burden of infectious dermatoses (51.4%)
- Adult patients had a peak prevalence of acne and pigmentary disorders (33.3%)
- Geriatric patients demonstrated significant xerosis/pruritus (33.3%) and neoplasms (40%)
- Inflammatory conditions remained relatively consistent across all groups (~26–28%)
- The observed differences were statistically highly significant ($p < 0.001$)

Summary of Results

The results clearly indicate that dermatological conditions are strongly influenced by age-related physiological and environmental factors. A progressive shift from infectious to degenerative and neoplastic skin conditions was observed across the lifespan.

Discussion

This study demonstrates significant variation in dermatological conditions across different age groups, consistent with existing literature. [12]

Pediatric patients showed a higher prevalence of infections, likely due to immature immune function and increased exposure to environmental pathogens. [13] Atopic dermatitis and fungal infections were particularly common, aligning with previous epidemiological findings. [14]

In adults, acne and pigmentary disorders dominated. Hormonal influences, especially androgens, contribute to increased sebaceous activity and acne formation. [15] Additionally, environmental exposure leads to hyperpigmentation and melasma. [16]

Geriatric patients exhibited xerosis, pruritus, and neoplasms. Reduced lipid content and impaired barrier function explain increased dryness and itching. [17] Chronic sun exposure contributes to actinic damage and malignancy risk. [18]

The high prevalence of neoplasms in elderly patients (40%) is consistent with global data emphasizing increased cancer risk with age. [19]

Physiological changes such as decreased collagen, reduced vascularity, and impaired repair mechanisms further exacerbate dermatological issues in older individuals. [20]

Statistical analysis confirmed a significant association between age and dermatological conditions ($p < 0.001$), reinforcing the need for age-specific clinical approaches. [21]

Preventive strategies such as sun protection, hydration, and early screening are particularly important in geriatric populations. [22]

Overall, this study highlights the importance of understanding dermatological transitions across the lifespan to improve patient care and outcomes. [23]

Conclusion

Age-related skin changes significantly influence the type and prevalence of dermatological conditions. Pediatric patients are more prone to infections, adults to acne and pigmentation, and geriatric individuals to degenerative and neoplastic conditions.

Tailored diagnostic and therapeutic strategies are essential for effective management across different age groups.

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