International Journal of Dermatology, Venereology and Leprosy Sciences

E-ISSN: 2664-942X
P-ISSN: 2664-9411
www.dermatologypaper.com/
Derma 2020; 3(2): 118-121
Received: 05-12-2020
Accepted: 22-12-2020

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Cutaneous changes in menopausal women: A cross-sectional study from a tertiary care center in south India

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DOI: https://www.doi.org/10.33545/26649411.2020.v3.i2b.233

Abstract
Background: Menopause is associated with a wide range of systemic and cutaneous changes due to the decline in estrogen levels. These dermatological manifestations can significantly impact quality of life, yet remain under-recognized in routine clinical practice.
Materials and Methods: This cross-sectional observational study was conducted at the Department of Dermatology, Aarupadai Veedu Medical College & Hospital, Puducherry, from October 2019 to September 2020. A total of 150 postmenopausal women aged 45-65 years were enrolled after informed consent. Detailed dermatological examination and patient history were documented. Data were analyzed using SPSS version 22. Chi-square and Fisher's exact tests were applied to assess associations, with $p<0.05$ considered statistically significant.
Results: Among the 150 participants, 92% exhibited at least one dermatological manifestation. The most common conditions observed were xerosis (78%), pigmentary changes (64%), and hair thinning (58%). Pruritus was reported in 46%, and onychodystrophy in 31%. A statistically significant correlation was found between the duration of menopause and the presence of hair and nail changes ($p=0.03$). Cutaneous signs were more severe among women with more than 10 years since menopause onset.
Conclusion: Dermatological changes are highly prevalent in postmenopausal women and are often overlooked. Regular dermatologic screening in menopausal clinics can facilitate early diagnosis and management, improving overall quality of life.

Keywords: Menopause, dermatological manifestations, xerosis, hair thinning, postmenopausal skin, estrogen deficiency

Introduction

Menopause marks the permanent cessation of menstruation, typically occurring between 45 and 55 years of age, and is diagnosed retrospectively after 12 months of amenorrhea [1]. This physiological transition is characterized by a decline in ovarian function and subsequent estrogen deficiency, which exerts widespread effects across multiple organ systems, including the skin [2]. Estrogen plays a crucial role in maintaining the structural integrity, hydration, and elasticity of the skin. Its deficiency can result in a variety of dermatological changes, many of which significantly affect physical appearance and psychosocial well-being [3].

Dermatological manifestations during menopause are diverse and often underreported. Common conditions include xerosis, alopecia, pigmentary alterations, pruritus, atrophic changes, and nail dystrophy [4]. These changes are not merely cosmetic but can signal underlying systemic shifts associated with estrogen withdrawal. Estrogen receptors are distributed throughout the skin, particularly in the dermis and epidermis, and their activation regulates collagen production, vascularization, and sebum secretion [5]. Therefore, the hormonal shift during menopause initiates a cascade of alterations that compromise cutaneous homeostasis.

Despite the high prevalence of these changes, dermatologic manifestations in menopausal women often remain underdiagnosed and inadequately managed. Women may not report these symptoms unless they cause significant discomfort or cosmetic concern. Furthermore, there is a paucity of targeted screening programs or protocols that integrate dermatologic

assessments into routine menopausal care [6]. Cultural stigmas and lack of awareness further contribute to the underrecognition of this issue in clinical practice.

In India, where climatic conditions and nutritional profiles vary significantly by region, the cutaneous presentation of menopause may exhibit unique patterns. Additionally, the burden of dermatological disorders may be compounded by environmental exposures, genetic predispositions, and healthcare accessibility [7]. While some studies from Western countries have documented the spectrum of dermatological changes during menopause, literature from the Indian subcontinent remains limited [8]. Local data is essential to guide region-specific diagnostic and therapeutic strategies.

Given this background, the present study aims to investigate the spectrum and frequency of dermatological manifestations among postmenopausal women attending a tertiary care dermatology outpatient clinic in South India. By identifying the common cutaneous changes and their associations with duration since menopause, this study seeks to highlight the importance of incorporating dermatological evaluation into routine postmenopausal care. Enhanced awareness can promote timely intervention, reduce morbidity, and improve quality of life in this underserved population [9].

Materials and Methods

Study Design and Setting: This cross-sectional observational study was conducted in the Department of Dermatology at Aarupadai Veedu Medical College & Hospital, Puducherry. The study period extended from October 2019 to September 2020. Ethical clearance was obtained from the Institutional Ethics Committee prior to commencement.

Participants: A total of 150 postmenopausal women aged between 45 and 65 years were enrolled using consecutive sampling. Menopause was defined as the cessation of menstruation for at least 12 consecutive months. Women with known dermatological conditions predating menopause, those undergoing hormone replacement therapy, and patients with systemic diseases affecting the skin (e.g., uncontrolled diabetes, thyroid disorders) were excluded to minimize confounding.

After obtaining written informed consent, participants underwent a structured interview and clinical examination. The questionnaire included demographic data (age, occupation, socioeconomic status), age at menopause, time since menopause, and personal habits. Dermatological examination was performed by a qualified dermatologist under adequate lighting, and findings were recorded using a standardized proforma. Skin, hair, nail, and mucosal changes were systematically assessed. Specific conditions like xerosis, hyperpigmentation, androgenetic alopecia, onychodystrophy, and pruritus were clinically diagnosed based on established dermatological criteria.

The primary outcome was the prevalence of dermatological manifestations in postmenopausal women. Secondary outcomes included associations between dermatological findings and duration since menopause, BMI, and age group.

Data were entered into Microsoft Excel and analyzed using IBM SPSS Statistics version 22.0. Continuous variables such as age were expressed as mean ± standard deviation (SD), while categorical variables like presence of xerosis or alopecia were expressed as frequencies and percentages. The Chi-square test and Fisher's exact test were used to determine associations between categorical variables. A p-value of <0.05 was considered statistically significant. Confidence intervals were calculated at the 95% level.

Results

Demographic Characteristics

Table 1: Demographic Profile of Study Participants (n = 150)

Variable		Frequency
Age (years)	45-50	40 (26.7%)
	51-55	64 (42.7%)
	56-60	34 (22.7%)
	>60	12 (8%)
Socioeconomic Status	Lower	38 (25.3%)
	Middle	79 (52.7%)
	Upper	33 (22%)
Duration since Menopause	≤5 years	58 (38.7%)
	6-10 years	62 (41.3%)
	>10 years	30 (20%)

Table 2: Distribution of Dermatological Manifestations (n = 150)

Dermatological Condition	Frequency (n)
Xerosis (Dry skin)	117 (78%)
Hyperpigmentation	96 (64%)
Hair thinning / Alopecia	87 (58%)
Pruritus	69 (46%)
Onychodystrophy (Nail changes)	47 (31.3%)
Atrophic vulvovaginitis	29 (19.3%)
Melasma	21 (14%)
Hirsutism	14 (9.3%)

Table 3: Anatomical Distribution of Major Skin Findings

Site Affected	Common Manifestation	Frequency (n)
Face	Melasma, hyperpigmentation	78 (52%)
Scalp	Alopecia	87 (58%)
Extremities	Xerosis, itching	104 (69.3%)
Nails	Onychodystrophy	47 (31.3%)
Genital area	Atrophic vulvovaginitis	29 (19.3%)

Table 4: Correlation of Dermatological Findings with Duration Since Menopause

Dermatological Manifestation	≤5 years (n=58)	6-10 years (n=62)	>10 years (n=30)	p-value
Xerosis	38 (65.5%)	52 (83.9%)	27 (90.0%)	0.014*
Hair thinning	26 (44.8%)	39 (62.9%)	22 (73.3%)	0.026*
Nail changes	12 (20.7%)	20 (32.3%)	15 (50.0%)	0.019*
Pruritus	23 (39.7%)	31 (50.0%)	15 (50.0%)	0.336

Table 5: Dermatological Manifestations by Age

Age Group (years)	Xerosis (%)	Alopecia (%)	Pigmentation (%)	p-value
45-50	65.0	42.5	55.0	0.03*
51-55	82.8	60.9	67.2	
>55	85.0	75.0	70.0	

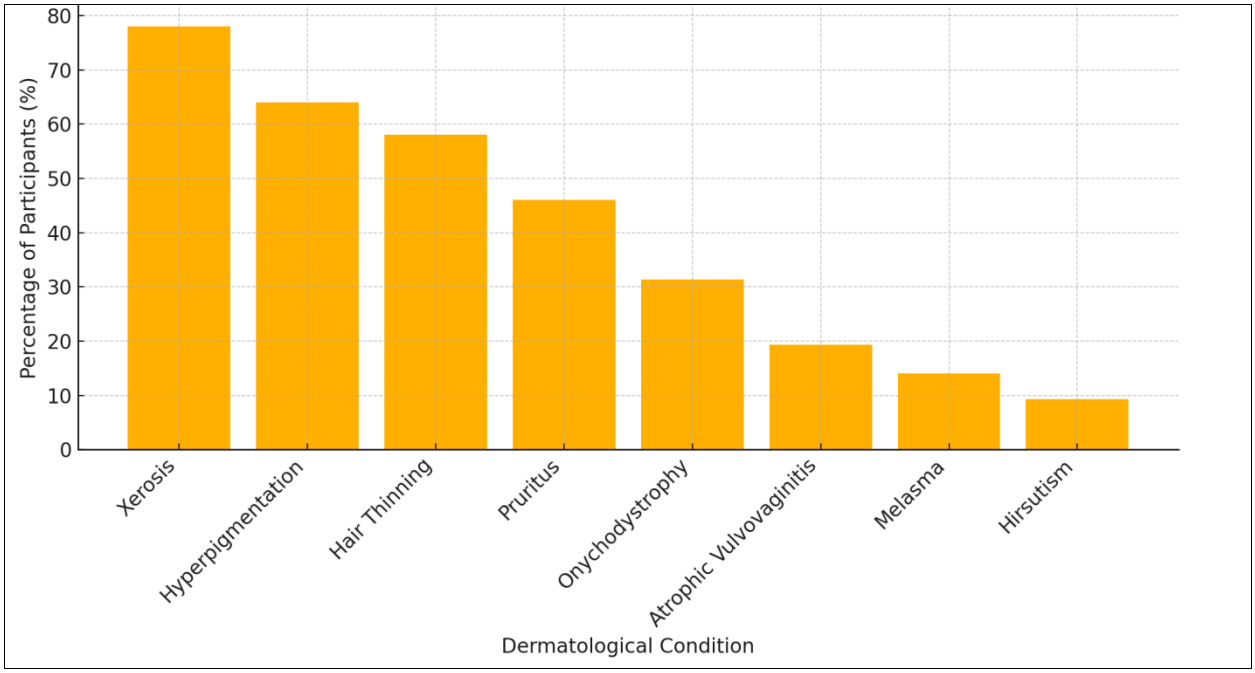

Fig 1: Prevalence of dermatological manifestations in post-menopausal women

Discussion

Menopause represents a significant physiological milestone, marked by estrogen deficiency that triggers systemic and dermatological alterations. In the present study, 92% of participants exhibited one or more dermatological manifestations, underscoring the substantial cutaneous impact of menopause.

The rationale behind this study stemmed from the relative underrecognition of dermatological changes in postmenopausal women in both clinical settings and public health discourse. Despite their high prevalence and influence on self-esteem and quality of life, these conditions are often overshadowed by vasomotor and metabolic concerns in menopause care [10].

Our findings align with those of previous studies. Xerosis was the most prevalent manifestation (78%), consistent with the study by Gambrell RD, who noted dryness in over 70% of menopausal women due to decreased sebaceous gland activity and impaired skin barrier function [11]. Similarly, hair thinning affected 58% of our cohort, which correlates with the 55-60% prevalence reported by Trüeb RM, who attributed it to a decline in estrogen-mediated anagen phase maintenance [12]. Nail changes, including brittleness and ridging, were observed in 31.3%, comparable to the 28% reported by Birch MP in their dermatological survey of postmenopausal women [13].

Hyperpigmentation, particularly on the face and sun-exposed areas, was found in 64% of our participants. This corresponds to the mechanisms described by Thornton MJ, who emphasized that estrogen modulates melanogenesis, and its decline may lead to uneven pigmentation and melasma [14].

An interesting finding was the statistically significant association between the duration of menopause and the severity of dermatological symptoms. Women more than 10 years post-menopause had markedly higher rates of xerosis (90%) and alopecia (73.3%), reflecting cumulative estrogen deficiency over time. These patterns are corroborated by findings from Brincat M, who observed a progressive worsening of skin and hair conditions with increasing menopausal duration [15].

Clinically, these findings highlight the need for integrative menopausal care models that incorporate dermatological evaluation. Routine screening for skin, hair, and nail changes should be considered a standard component of postmenopausal assessments, especially in primary care and gynecology clinics. Counseling on skin care, nutrition, and possible topical treatments (e.g., emollients, antioxidants) may significantly improve symptoms and psychological well-being.

Conclusion

This cross-sectional study underscores the high prevalence of dermatological manifestations among postmenopausal women, with xerosis, hyperpigmentation, and hair thinning being the most frequent. A significant correlation was observed between the duration of menopause and the severity of cutaneous, hair, and nail changes. These findings emphasize the need for proactive dermatological assessment and tailored skin care interventions during postmenopausal health visits to improve both physical and psychosocial well-being.

Acknowledgment

The authors wish to thank the faculty for providing institutional support, and all the participants for their voluntary involvement in this study.

Conflicts of Interest

The authors declare no conflicts of interest related to this study.

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