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Original Article

Dermatology Section

Dermoscopic Skin Pattern Differences between Male and Female Young Adults: A Cross-sectional Study

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ABSTRACT

Introduction: Dermoscopy is a rapidly evolving non invasive diagnostic tool that utilises an easy-to-use hand-held dermatoscope attached to mobile phones. It captures clear and magnified images of the skin's surface and subsurface structures.

Aim: To determine the dermoscopic differences in the male and female skin.

Materials and Methods: A cross-sectional study was conducted at the Government Medical College, Thrissur, Kerala, India from October 2021 to November 2021 after getting ethics committee approval. A total of 82 first-year MBBS students, aged 18-25 years who had no prior skin conditions and were willing to participate in the study were included. Questionnaire was given to obtain personal details. Dermoscopic photographs of the lateral aspect of the forearm was taken- Skin surface changes, vascular patterns and pigmentation patterns were the main parameters considered. The data was coded and entered into Microsoft Excel, expressed as frequencies and percentages. A Chi-square test (χ^2) was used to determine whether the observations differed between males and females.

Results: There were 82 study subjects, comprising 37 males and 45 females, aged 18-25 years. None of the subjects regularly used sunscreen or moisturiser. The duration of sun exposure was never more than two hours per day. The Chi-square test showed a significant difference in pigmentation and hair pattern on the lateral side of the forearm among males and females. Small brown globules showed a p-value=0.027, eccrine skin hypopigmentation-p-value=0.002, follicle skin hypopigmentation-p-value=0.011 and hair changes- p-value=0.002.

Conclusion: Understanding the differences between male and female skin helps identify physiological and hormonal influences on skin, guides personalised dermatological assessment, and improves diagnostic accuracy and treatment strategies.

Keywords: Eccrine skin hypopigmentation, Patchy skin hypopigmentation, Pigmentation pattern, Vascular changes

INTRODUCTION

The skin is the most significant, accessible, and visible organ of the body, with a multitude of described pathological conditions and non pathological variations [1]. Since many skin conditions share overlapping features, even experts may find diagnosis difficult. Recognising what is normal is therefore crucial before identifying abnormalities [2]. Identifying the differences between male and female skin helps dermatologists develop a proper approach for the management of skin diseases and to properly take care of cosmetic problems [3]. Dermoscopy is a rapidly evolving non invasive diagnostic tool that uses a hand-held dermatoscope attached to mobile phones. There are mainly two modes of dermoscopy: non polarised and polarised. They complement each other, and the combination of both methods helps improve diagnostic accuracy [4]. Non polarised dermoscopy is used to view superficial skin {the epidermis to the Dermo-Epidermal Junction (DEJ)}. Polarised dermoscopy can be used to view deeper layers of the skin (the DEJ and superficial dermis) [4,5]. Initially used solely for diagnosing melanomas, dermoscopes have now been found to be valuable as a rapid diagnostic aid in office settings [6].

Specific patterns and descriptions are recognised in many pathological conditions, which helps resolve diagnostic dilemmas. Rahrovan S, et al., published an article titled "Male versus female skin: What dermatologists and cosmeticians should know" in this article the differences in male and female skin regarding skin surface features were the focus [3]. Other study focus on skin lesions and ageing related parameters [7,8]. The differences in skin characteristics between males and females - including hair changes and pigmentation patterns in normal skin - has not been adequately explored, particularly among the young South Indian population.

The primary objective of this study was to identify dermoscopic differences between male and female skin.

This is another segment of authors study published earlier titled "Dermoscopic analysis of skin changes associated with sun exposure among medical students in a tertiary care centre in Central Kerala" [9].

MATERIALS AND METHODS

This cross-sectional study was conducted at Government Medical College, Thrissur, Kerala, India from October 2021 to November 2021. The study was initiated after receiving approval from the Institutional Ethics Committee of Government Medical College, Thrissur (Ref. No. IEC/GMCTSR/194/2021). Detailed information regarding the study procedures and the purpose of photography was provided to all potential participants, and their written informed consent was obtained.

Inclusion criteria: Young medical students aged 18-25 years who are willing were included in the study.

Exclusion criteria: Students with either known or newly diagnosed skin conditions, those with noticeable skin lesions upon inspection, individuals on regular medication, students from other states, those with systemic illnesses, individuals with a history of smoking, and those who declined to provide consent were excluded from the study.

Study Procedure

Participants completed a proforma inquiring about their level of sun exposure, use of cosmetics (specifically sunscreen and moisturiser), regular application of skin oils, and any previous history of skin diseases. Sunlight exposure was categorised based on the average number of hours spent in the sun each day, with less than one hour

classified as mild, one to two hours as moderate and over two hours as severe exposure to sunlight [10].

Fitzpatrick skin type of the study participants were noted by the investigator. Fitzpatrick skin phototypes were developed based on an individual's skin colour and their tendency to burn or tan when exposed to sunlight [11]. Dermoscopic images were captured. All observations were meticulously examined using a hand-held dermoscope - Illuco IDS 1100 series, featuring 10x magnification, coupled with an integrated Android phone camera (Samsung A50) boasting 2x magnification for the acquisition and preservation of images. The employment of this particular dermoscope facilitates the acquisition of various types of images, such as Polarised Light Contact Dermoscopy (PCD), Polarised Light Non Contact Dermoscopy (PNCD), Non Polarised Light Contact Dermoscopy (NPD), and Non Polarised Light Non Contact Dermoscopy (NPNCD).

The images were captured from the lateral aspect of the forearm, positioned 5 cm away from the lateral epicondyle, using a 20x magnification at a fixed distance of 1 cm from the skin. Two pictures were obtained, one with polarisation and one without, utilising a non contact approach. The selection of this specific site and method was based on its easy access and safety during the pandemic situation, so that removal of face mask and close contact on skin was not required. A dermatologist validated the dermatoscopic findings, and any obvious skin lesions were deliberately omitted. Skin findings observed using a dermoscope include skin surface changes (xerosis), pigmentation patterns (hyperpigmentation and hypopigmentation), and white hairs, even though vascular patterns were looked for they were not found [8]. Degree of xerosis can be classified into- mild: scaling limited to skin furrows; moderate: scaling extending beyond skin furrows; severe: plate-like scaling extending beyond skin furrows with formation of deep skin fissure [8,12]. The pigmentation pattern was graded based on the intensity of the findings as mild, moderate, and severe. Where mild means that <25% of the examined field is involved, in moderate, 25-50% of the field is involved, and in severe,>50% of the field is involved. Since a regular pigmentation pattern, as seen through a dermoscope, was not previously graded, a specific system was not available; therefore, this grading system was chosen.

STATISTICAL ANALYSIS

Data was coded and entered in Microsoft Excel. The data was analysed through the Statistical Package for the Social Sciences (SPSS) statistics software windows version 22.0. Data was expressed as frequency and percentages. Chi-square test was used to identify whether the observations were different among males and females. A p-value< 0.05 was considered as statistically significant.

RESULTS

Demographic and clinical details are mentioned in [Table/Fig-1].

Variable		n (%)
Age (years)	18-25	82
Gender	Male	37 (45.1)
	Female	45 (54.9)
Regular cosmetic usage (including sunscreen and moisturiser)	No	82
Oil application on skin	Yes	16 (19.5)
	No	66 (80.5)

[Table/Fig-1]: Demographic and clinical profiles of study participants.

None of the study subjects had duration of sun exposure more than two hours/day [Table/Fig-2]. Majority of the subjects belonged to Fitzpatrick skin type 4 [Table/Fig-3].

Small brown globules, eccrine skin hypopigmentation, follicle skin hypopigmentation and hair changes (white hairs) showed statistically significant differences among males and females [Table/Fig-4].

Duration sun exposure (hours/day)	Gender n (%)	
	No: of Males	No: of Females
(Mild) <1 hour	9 (24.3)	25 (55.6)
(Moderate) 1 to 2 hours	28 (75.7)	20 (44.4)
(Severe)> 2 hours	0	0
Total	37	45

[Table/Fig-2]: Duration of sun exposure among males and females.

Skin type	Gender n (%)	
	No: of Males	No: of Females
4	32 (86.5)	37 (82.2)
5	5 (13.5)	8 (17.8)
Total	37	45

[Table/Fig-3]: Distribution based on Fitzpatrick skin type.

Changes	Male	Female	
	n (%)	n (%)	p-value
Surface changes (xerosis)	24 (64.9)	25 (55.6)	0.392ns
Reticular pigmentation	23 (62.2)	30 (66.7)	0.671ns
Homogeneous patchy pigmentation	20 (54.1)	24 (53.3)	0.948ns
Small brown globules pigmentation	10 (27.0)	3 (6.7)	0.027*
Eccrine skin hypopigmentation	35 (94.6)	30 (66.7)	0.002**
Follicle skin hypopigmentation	20 (54.1)	12 (26.7)	0.011*
Patchy skin hypopigmentation	17 (45.9)	17 (37.8)	0.455ns
Hair changes (white hair)	9 (24.3)	0	0.002**
Vascular patterns	0	0	-

[Table/Fig-4]: Comparison of changes in dermoscopic patterns in lateral side among males and females.
Chi-square test.

It can be noted that 13.5% males had severe xerosis, whereas only 2.2% females had severe xerosis [Table/Fig-5].

Surface changes (xerosis)	Male	Female
	n (%)	n (%)
Absent	13 (35.1)	20 (44.4)
Mild	11 (29.7)	13 (28.9)
Moderate	8 (21.6)	11 (24.4)
Severe	5 (13.5)	1 (2.2)
Total	37 (100)	45 (100)

[Table/Fig-5]: Distribution of xerosis of skin based on intensity among male and female subjects.

Severe reticular pigmentation was not seen in males, whereas 6.7% of females showed severe reticular pigmentation pattern [Table/Fig-6]. Majority of males and females showed mild homogenous patchy pigmentation pattern [Table/Fig-7]. Among the males, the majority (18.9%), showed only mild distribution of small brown globules [Table/Fig-8].

Reticular pigmentation	Male	Female
	n (%)	n (%)
Absent	14 (37.8)	15 (33.3)
+	19 (51.4)	24 (53.3)
++	4 (10.8)	3 (6.7)
+++	0	3 (6.7)
Total	37 (100)	45 (100)

[Table/Fig-6]: Distribution of reticular pigmentation pattern based on intensity (+) mild, (++) moderate and (+++) severe among male and female subjects.

43.2% males showed moderate distribution of eccrine skin hypopigmentation, and it was less compared to females, only 20%

Homogeneous patchy pigmentation	Male	Female
	n (%)	n (%)
Absent	17 (45.9)	21 (46.7)
+	18 (48.6)	21 (46.7)
++	1 (2.7)	3 (6.7)
+++	1 (2.7)	0
Total	37 (100)	45 (100)

[Table/Fig-7]: Distribution of homogeneous patchy pigmentation based on intensity (+) mild, (++) moderate and (+++) severe among male and female subjects.

Small brown globules	Male	Female
	n (%)	n (%)
Absent	27 (73)	42 (93.3)
+	7 (18.9)	2 (4.4)
++	2 (5.4)	0
+++	1 (2.7)	1 (2.2)
Total	37 (100)	45 (100)

[Table/Fig-8]: Distribution of small brown globules based on intensity {(+) mild, (++) moderate and (+++) severe} among male and female subjects.

females had moderate distribution of eccrine skin hypopigmentation [Table/Fig-9].

Eccrine skin hypopigmentation	Male	Female
	n (%)	n (%)
Absent	2 (5.4)	15 (33.3)
+	17 (45.9)	20 (44.4)
++	16 (43.2)	9 (20.0)
+++	2 (5.4)	1 (2.2)
Total	37 (100)	45 (100)

[Table/Fig-9]: Distribution of eccrine skin hypopigmentation on the lateral side of forearm based on intensity {(+) mild, (++) moderate and (+++) severe} among male and female subjects.

Moderate distribution of follicle skin hypopigmentation was seen among 21.6% of males, whereas among females only 8.9% showed moderate level distribution of follicle skin hypopigmentation [Table/Fig-10].

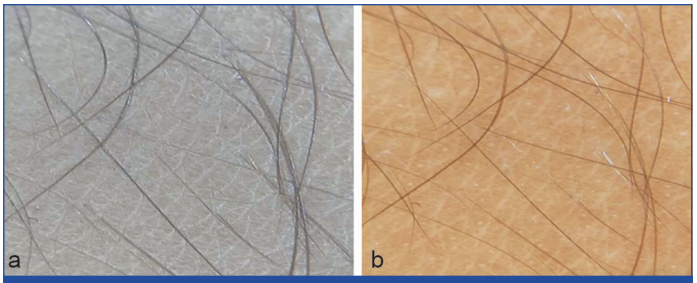
Follicle skin hypopigmentation	Male	Female
	n (%)	n (%)
Absent	17 (45.9)	33 (73.3)
+	12 (32.4)	8 (17.8)
++	8 (21.6)	4 (8.9)
+++	0	0
Total	37 (100)	45 (100)

[Table/Fig-10]: Distribution of follicle skin hypopigmentation based on intensity {(+) mild, (++) moderate and (+++) severe} among male and female subjects.

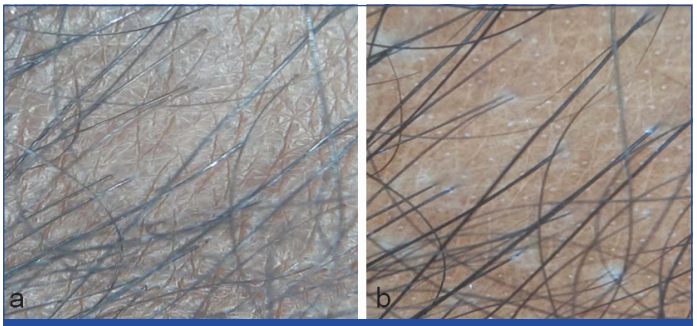
Most of the males and females had mild distribution of patchy skin hypopigmentation [Table/Fig-11]. Images are shown in [Table/Fig-12,13].

Patchy skin hypopigmentation	Male	Female
	n (%)	n (%)
Absent	20 (54.1)	28 (62.2)
+	16 (43.2)	16 (35.6)
++	1 (2.7)	1 (2.2)
+++	0	0
Total	37 (100)	45 (100)

[Table/Fig-11]: Distribution of patchy skin hypopigmentation based on intensity {(+) mild, (++) moderate and (+++) severe} among male and female subjects.



[Table/Fig-12]: Dermoscopic image of the lateral aspect of forearm in a female: a) Non polarised view- showing mild xerosis; b) Polarised view- showing reticular pigmentation pattern, patchy skin hypopigmentation and eccrine skin hypopigmentation.



[Table/Fig-13]: Dermoscopic image of the lateral aspect of forearm in a male: a) Non polarised view- showing severe xerosis; b) Polarised view- showing reticular pigmentation pattern, homogenous patchy pigmentation, patchy skin hypopigmentation, follicle skin hypopigmentation and eccrine skin hypopigmentation.

DISCUSSION

Researchers have not clearly been able to pin-point the reasons for differences in male and female skin. Genetics, sex hormones, occupation, hobbies, dietary aspects, behavioural factors and differences in environment may all contribute to these differences. Homeostatic and functional factors, such as sweat rate, blood flow, pH, sensory response, response to irritants, and reparative abilities, also affect male and female skin differently [3].

This study included 82 subjects of age group 18–25 years and ethnicity (Fitzpatrick skin types IV and V), Using the non polarised dermoscopy, it was observed that more than 50% of both males and females had xerosis on their skin. Xerosis is caused by reduced hydration of the stratum corneum (as the study was conducted in October-November, November is one of the least humid months). It is characterised by signs such as small to large scales, cracks, and inflammation [12]. This can be correlated with the fact that the majority of study subjects do not regularly apply moisturisers or oil. In the current study, it was observed that severe xerosis was seen more among males compared to females. It is explained by the fact that males produce much more sebum than females due to the stimulatory effects of male hormones such as testosterone [13]. Xerosis is a condition that affects patients quality of life and impaired skin barrier is a risk factor for the development of skin diseases such as atopic or allergic dermatitis. Identification of the severity of xerosis is very important to plan treatment [14].

Adya KA et al., concluded that reticular pigmentation pattern is the most common pattern in heavily pigmented skin [15]. Similar findings were obtained in this study (62.2% males and 66.7% females had reticular pigmentation pattern). Agrawal S et al., described the reticular appearance as a pseudo-network pattern caused by hair follicles interrupting the pigment, giving a reticular appearance [16]. In certain conditions like vitiligo, this normal pattern is disrupted due to the loss of melanocytes, resulting in a “negative” pigment network where the pale areas become more prominent [17].

Pigment deposition was also seen as small brown globules; males had more small brown globules compared to females, and this difference was statistically significant (p-value = 0.027). These small brown dots are due to focal accumulations of melanin at the spinous layer or DEJ, which histologically correlate to tiny junctional

melanocytic nests. Acute UV exposure was identified as the main reason for the formation of small brown dots, although they usually tend to disappear over time [14]. Males had more sun exposure compared to females this explains why they have more small brown dots in their skin [9].

Among these pigmentation patterns, there are also hypopigmented areas, which showed some specific patterns of distribution. The most common was the eccrine skin hypopigmentation. Interspersed between the hyperpigmented areas, there are pinpoint white dots representing the eccrine duct openings. Eccrine duct is the duct that carries sweat from the eccrine gland in the skin to the surface. Eccrine hypopigmentation was most commonly seen among males compared to females and this difference was statistically significant (p-value=0.002). Eccrine duct openings are pale they are well-defined and rounded structures that have uniform spacing in between [18].

Another type of hypopigmentation observed was follicular hypopigmentation, which was more prevalent in male subjects than in female subjects, and this difference was statistically significant (p-value=0.011). It is a normal finding in individuals with Fitzpatrick skin types IV, V and VI. The white dots are uniform in size and shape with dark pigmented reticular background, this pattern is described by the term “honeycomb pattern” [18]. Ocampo-Garza J and Tosti A, in their article described pinpoint small white dots (0.2- to 0.3-mm) that are regularly distributed between the follicular units. Reflectance confocal microscopy showed that these dots correspond to acrosyringeal and follicular openings [19].

Even though vascular patterns were explicitly looked for, none were noted among the present study subjects. Agrawal S et al., concluded that vascular patterns in dermoscopy are more common among the elderly than among youngsters [16]. This study provides baseline dermoscopic data on Indian skin types, specifically from Central Kerala, which is currently limited in literature.

Limitation(s)

- Sample size of this study was less (82 participants), which may limit the generalisability of findings to the broader population.
- Since the study was conducted during COVID time, to achieve minimal contact, images could be taken only from the lateral aspect of the forearm, which may not represent dermoscopic differences in other body areas.

CONCLUSION(S)

Dermoscopy serves as a valuable non invasive tool for early identification of hydration status, pigmentation differences, and microstructural skin changes. This study highlights distinct dermoscopic differences between male and female skin in a young South Indian population with Fitzpatrick skin types IV and V. Establishing such baseline dermoscopic profiles in the Indian population can improve diagnostic accuracy, treatment, guide preventive skincare strategies and will help to create a database of these parameters in the Indian population. Recognising gender-linked cutaneous differences can also inform research planning and lead to the development of products tailored specifically for women and men, improving the effectiveness of dermatological and cosmetic procedures.

REFERENCES

[1] Dańczak-Pazdrowska A, Gornowicz-Porowska J, Polańska A, Krajka-Kuźniak V, Stawny M, Gostyńska A, et al. Cellular senescence in skin-related research: Targeted signaling pathways and naturally occurring therapeutic agents. Aging Cell. 2023;22(6):e13845. Doi: 10.1111/acel.13845. Epub 2023 Apr 11. PMID: 37042069; PMCID: PMC10265178.

[2] Obahiagbon I, Omatighene EOU. Clinico-pathological consistency in the diagnosis of skin disorders in a tertiary care hospital in Southern Nigeria: A descriptive cross-sectional analysis. J Adv Med Med Res. 2024;36(5):15-21.

[3] Rahrovan S, Fanian F, Mehryan P, Humbert P, Firooz A. Male versus female skin: What dermatologists and cosmeticians should know. Int J Womens Dermatol. 2018;4(3):122-30. Doi: 10.1016/j.ijwd.2018.03.002. PMID: 30175213; PMCID: PMC6116811.

[4] Thompson H: DermNet NZ Editor in Chief: Adjunct A/Prof Amanda Oakley, Dermatologist, Hamilton NZ. A comparison of polarised and nonpolarised dermoscopy. Dermnet NZ [Internet]. 2020;:01-05. Available from: https://dermnetnz.org/topics/a-comparison-of-polarised-and-nonpolarised-dermoscopy/.

[5] Nirmal B. Dermatoscopy: Physics and principles. Indian J Dermatopathology and Diagnostic Dermatology. 2017;4(2):27.

[6] Alma A, Sticchi A, Chello C, Guida S, Farnetani F, Chester J, et al. Dermoscopy, reflectance confocal microscopy and optical coherence tomography features of acne: A systematic review. J Clin Med. 2022;11(7):1783. Doi: 10.3390/jcm11071783. PMID: 35407391; PMCID: PMC8999263.

[7] Respati RA, Yusharyahya SN, Wibawa LP, Widaty S. The dermoscopic features of photoaging and its association with sun index score in the coastal population at Cilincing, Jakarta: A cross-sectional study. Clin Cosmet Investig Dermatol. 2022;15:939-46. Doi: 10.2147/CCID.S355260. PMID: 35642176; PMCID: PMC9148576.

[8] Hu SC, Lin CL, Yu HS. Dermoscopic assessment of xerosis severity, pigmentation pattern and vascular morphology in subjects with physiological aging and photoaging. Eur J Dermatol. 2019;29(3):274-80. Doi: 10.1684/ejd.2019.3555. PMID: 31389786.

[9] Shojan T, Lakshmipriya M, Prathap P, Unnikrishnan Vv. Dermoscopic analysis of skin changes associated with sun exposure among medical students in a tertiary care center in Central Kerala. Natl J Physiol Pharm Pharmacol. 2024;(0):1.

[10] Patwardhan V, Mughal Z, Chiplonkar S, Webb A, Kift R, Khadilkar V, et al. Duration of casual sunlight exposure necessary for adequate Vitamin D status in Indian Men. Indian J Endocrinol Metab. 2018;22(2):249.

[11] Gupta V, Sharma VK. Skin typing: Fitzpatrick grading and others. Clin Dermatol [Internet]. 2019;37(5):430-36. Available from: https://doi.org/10.1016/j.clindermatol.2019.07.010.

[12] Amin R, Lechner A, Vogt A, Blume-Peytavi U, Kottner J. Molecular characterization of xerosis cutis: A systematic review. PLoS One [Internet]. 2021;16:1-22. Available from: http://dx.doi.org/10.1371/journal.pone.0261253.

[13] Amin R, Völzer B, Genedy-Kalyoncu M El, Blume-Peytavi U, Kottner J. The prevalence and severity of dry skin and related skin care in older adult residents in institutional long-term care: A cross-sectional study. Geriatr Nurs (Minneap). 2023;54:331-40.

[14] Augustin M, Wilsmann-Theis D, Körber A, Kerscher M, Itschert G, Dippel M, et al. Diagnosis and treatment of xerosis cutis – A position paper. JDDG - Journal of the German Society of Dermatology. 2019;17(S7):3-33.

[15] Adya KA, Inamadar AC, Palit A. Dermoscopic pigment network: Characteristics in non-melanocytic disorders. Indian Dermatol Online J. 2020;11(2):146-53. Doi: 10.4103/idoj.IDOJ_246_19. PMID: 32477970; PMCID: PMC7247650.

[16] Agrawal S, Sharma A, Ramam M, Khandpur S, Khaitan BK, Datt Upadhyay A, et al. Mapping the dermoscopic features of the normal face: Findings from 200 subjects with skin of colour. Indian J Dermatol Venereol Leprol. 2025:1-8. Doi: 10.25259/IJDVL_107_2025. Epub ahead of print. PMID: 40826866.

[17] Godínez-Chaparro JA, Roldán-Marín R, Vidaurri-de la Cruz H, Soto-Mota LA, Férez K. Dermatoscopic patterns in vitiligo. Dermatol Pract Concept [Internet]. 2023 [cited 2025 Nov. 17];13(4):e2023197. Available from: https://dpcj.org/index.php/dpc/article/view/3120.

[18] Jain N, Doshi B, Khopkar U. Trichoscopy in alopecias: Diagnosis simplified. Int J Trichology. 2013;5(4):170-78. Doi: 10.4103/0974-7753.130385. PMID: 24778525; PMCID: PMC3999645.

[19] Ocampo-Garza J, Tosti A. Trichoscopy of dark scalp. Skin Appendage Disord. 2018;5(1):01-08. Doi: 10.1159/000488885. Epub 2018 Jul 18. PMID: 30643773; PMCID: PMC6323385.

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