



CLINICOEPIDEMIOLOGICAL STUDY OF VARIOUS DERMATOLOGICAL DISEASES IN ADOLESCENT AGE GROUP

Dermatology

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ABSTRACT

Background: Adolescence refers to the age group ranging from 10 to 19 years, which represents a transitional stage of physical and physiological human development that occurs between puberty and adulthood. Hormonal changes during puberty lead to a variety of physical and psychological transformations that can impact social relationships. During this stage, adolescents place great importance on their external appearance, making any dermatological condition significantly affect their psychological well-being. Therefore, the purpose of the present study was to shed light on the prevalence and types of dermatoses among adolescents. **Aims and Objectives:** To study clinico-epidemiological pattern of different skin lesions in patients aged between 10 and 19. To determine the prevalence of the dermatoses of the adolescent age group. **Materials and Methods:** 1345 patients between the age group of 10 and 19 years with dermatological complaints attending the Outpatient Department of Dermatology of Govt. Medical College Kota were selected. A detailed history taking, clinical examination and relevant investigations were performed to arrive at the diagnosis. **Results:** Infections 518 (38.45%) were the most common dermatoses followed by acne 231 (17.1%), dermatitis 182 (13.5%), appendageal disorders 77 (5.7%) keratinisation disorders 64 (4.75%), papulosquamous disorders 57 (4.23%), pigmentary disorders 50 (3.71%), papular urticaria 50 (3.71%) urticaria/dermographism 49 (3.64%), naevi 21 (1.56%), keloid 14 (1.04%). Amongst infections, the most common were dermatophytoses 172 (12.8%), scabies 77 (5.71%), and verrucae 72 (5.34%). **Conclusions:** This study gives an insight of various dermatological conditions among the adolescent age groups. Males slightly more commonly presented with dermatoses. The most common dermatoses were infections.

KEYWORDS

Adolescents, Dermatoses, Prevalence

INTRODUCTION

Adolescence – An age of Opportunity:

The term adolescence comes from Latin word meaning "to grow to maturity". The world is home to 1.2 billion individuals aged 10–19 years equal to 1/5th of world population. Currently, one in every five person on the earth is an adolescent and 85% of these adolescents live in developing countries. In India, 20.07% of the total population is adolescents i.e. more than 200 million.¹ Adolescence is an age of opportunity for children, and a pivotal time for us to build on their development.

Physical Changes In Adolescence:

Growth is the increase in the body size and mass as a result of the increase in the number and size of cells. Development is the differentiation and maturation of biological functions of organs.² Physical changes include general increase in growth rate of skeleton, muscles and viscera, gonadal growth and development, changes in body composition, sexual development, and growth spurt.³

Hormonal Changes In Adolescence:

Most noticeable change during adolescence is increased secretion of sebum due to a surge in sex hormones like androgen, progesterone and estrogen which stimulate sebaceous glands. Small peptide hormones are synthesized and stored in hypothalamic nuclei which regulate secretion of pituitary hormones like Thyrotropin releasing hormone (TRH), somatotropin release inhibiting factor (SRIF, somatostatin), and gonadotropin releasing hormone (GnRH) (also referred to as luteinizing hormone releasing hormone, LHRH).⁴ Hypothalamus secretes GnRH which in turn stimulates pituitary gland to secrete LH and FSH. Estrogen and progesterone decreases the level of LH and FSH in females and males respectively. Inhibin which is a product of spermatogenic tubules is considered to play an important role in FSH regulation.

MATERIALS & METHODS

Source of Data:

- All patients aged between 10 and 19 attending the out patient department of dermatology, venerology and leprology in Government medical college Kota Rajasthan.

Inclusion Criteria:

- All patients aged between 10 and 19 years with any dermatological complaint.

Period of Data Collection: Jan 2021 to December 2022.

Method of Data Collection:

- A detailed history of the patient's disease was taken including the name, age, sex, nature and duration of illness, predisposing factors like drug intake, topical application of medicines and cosmetics etc.
- Diagnosis was made on the basis of history and clinical examination. Investigations like KOH mount, Tzanck smear, Gram's stain, Wood's lamp examination, biopsy were done as and when required.

OBSERVATIONS & RESULTS

In the study, there were a total of 1345 patients in the adolescent age group (10-19 years) out of which 717 (53.3%) were males and 628 (46.7%) were females. (Table 1)

Table 1. Sex distribution of study population:

Study group	Males (%)	Females (%)
Adolescents (10-19 years)	717 (53.3%)	628 (46.7%)

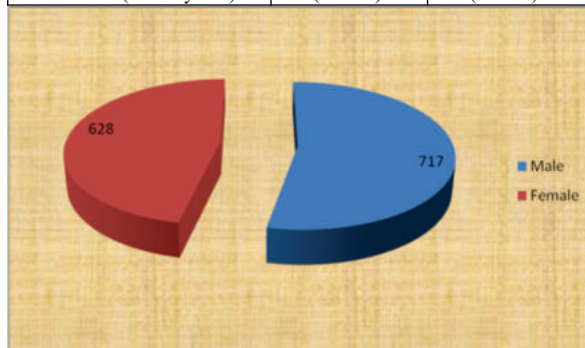


Figure 1. Sex distribution of study population

Table 2: Age distribution of study population:

AGE (YR)	COUNT	%
10-13(Early Adolescent)	362	26.92%
14-16(Mid Adolescent)	463	34.42%
17-19(Late Adolescent)	520	38.66%

The most common type of dermatoses found in our study were infections, constituting a total of 518 (38.45%) of the total study population, followed by acne 231 (17.1%), dermatitis 182 (13.5%), appendageal disorders 77(5.7%), keratinisation disorders 64 (4.75%), papulosquamous disorders 57 (4.23%), pigmentary disorders 50 (3.71%) insect bite reaction 50 (3.71%),and urticaria 49(3.64%) (Figure 2)

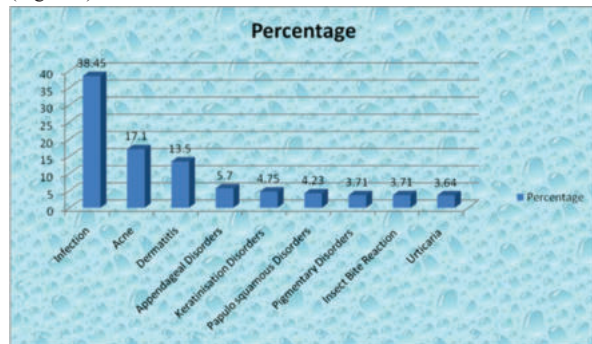


Figure 2. Distribution of various dermatoses in the study population

Table 3: Distribution of various dermatoses in the study population:

S.No.	DERMATOSES	N	%
1	INFECTION	518	38.45%
	a) Bacterial	48	3.56
	i. Folliculitis	15	1.11
	ii. Frunculosis	11	0.82
	iii. Pyoderma	10	0.74
	iv. Impetigo	7	0.52
	v. Hansens Disease	5	0.37
	b) Fungal	245	18.2
	i. Dermatophytoses	172	12.8
	ii. Tinea versicolor	73	5.42
	c) Viral	134	9.94
	i. Warts	72	5.34
	ii. Pityriasis Rosea	36	2.67
	iii. Chickenpox	6	0.45
	iv. Herpes Zoster	7	0.52
	v. Herpes Labialis	3	0.22
	vi. Molluscum contagiosum	10	0.74
	d) Parasitic	91	6.75
	i. Scabies	77	5.71
	ii. Pediculosis	14	1.04
2	DERMATITIS	182	13.5
	i. Polymorphic light eruptions	60	4.45
	ii. Eczema	39	2.89
	iii. Seborrheic dermatitis	22	1.63
	iv. Pityriasis alba	21	1.56
	v. Atopic Dermatitis	15	1.11
	vi. Pompholyx	14	1.04
	vii. Contact Dermatitis	11	0.82
3	PIGMENTARY DISORDERS	50	3.71
	i. Vitiligo	25	1.85
	ii. Post inflammatory hyperpigmentation	16	1.19
	iii. Peri Orbital Melanosis	4	0.3
	iv. Freckles	3	0.22
	v. Acropigmentation of Dohi	2	0.15
4	NAEVI	21	1.56
	i. Nevus depigmentosus	5	0.37
	ii. N. Sebaceous	3	0.22
	iii. Becker's Nevus	4	0.3
	iv. N. Comedonicus	2	0.15
	v. Nevus of Ota	2	0.15
	vi. Verrucous epidermal nevus	5	0.37
5	PAPULO SQUAMOUS DISORDERS	57	4.23
	i. Psoriasis	22	1.64

	ii. Lichen planus	12	0.89
	iii. LPP	5	0.37
	iv. Lichen nitidus	5	0.37
	v. Lichen Striatus	5	0.37
	vi. Pityriasis rubra pilaris	7	0.52
	vii. Pityriasis Lichenoides Chronica	1	0.07
6	KERATINISATION DISORDERS	64	4.75
	i. Phrynoderma	11	0.82
	ii. Keratosis pilaris	10	0.74
	iii. Ichthyosis	8	0.59
	iv. Keratosis exfoliativa	7	0.52
	v. Milia	12	0.89
	vi. Acanthosis Nigricans	8	0.59
	vii. Palmoplantar Keratoderma	5	0.37
	viii. Porokeratosis	3	0.22
7	CONNECTIVE TISSUE DISORDER	8	0.59
	i. Discoid Lupus Erythematosus	3	0.22
	ii. Systemic sclerosis	3	0.22
	iii. Morphea	2	0.15
8	HAMARTONEOPLASTIC SYNDROME	6	0.45
	i. Neurofibromatosis	3	0.22
	ii. Tuberous Sclerosis	3	0.22
9	APPENDAGEAL DISORDERS	77	5.7
	a) Nail disorders	8	0.59
	i. Paronychia	4	0.3
	ii. Onychomycosis	3	0.22
	iii. Twenty Nail dystrophy	1	0.07
	b) Sweat gland disorders	31	2.3
	i. Hyperhidrosis	15	1.11
	ii. Miliaria rubra	13	0.96
	iii. Fox-fordyce – disease	3	0.22
	c) Hair disorder	38	2.82
	i. Alopecia areata	18	1.41
	ii. Telogen effluvium	11	0.82
	iii. Canitis	8	0.59
10	ACNE	231	17.1
11	URTICARIA	49	3.64
12	KELOID	14	1.04
13	PAPULAR URTICARIA / IBR	50	3.71
14	MISCELLANEOUS	36	2.67
	i. Xerosis	6	0.45
	ii. Hidradinitis Suppurativa	2	0.15
	iii. Erythema Multiforme	5	0.37
	iv. Mucocel	6	0.45
	v. Pyogenic granuloma	5	0.37
	vi. Bristel Bital Dermatitis	5	0.37
	vii. DPN	3	0.22
	viii. Macular Amyloidosis	3	0.22
	ix. Lupus Vulgaris	1	0.07

DISCUSSION

Sex Distribution

- In our study, males constituted 717 (53.3%) and females, 628 (46.7%) of the study population.
- Sharma et al.,⁵ found a similar male preponderance in their study where as Kalaiselvan et al.,⁷ and Nadia et al.,⁶ reported a female preponderance in their study.

Infections

The most common dermatoses in our study were infections, observed in 518(38.45%) of the study population. This is in accordance with the study conducted in Punjab by Sharma et al.,⁵ that reported infections to be the most common dermatoses (30.8%).⁵ Another study in Tunisia by Nadia et al., also reported infections as the predominant dermatoses in the adolescent age group representing 37.7% of all dermatoses.⁶

In a study conducted at a school in south India by Kalaiselvan and Karthikeyan,⁷ infections were the second most common dermatoses among the adolescents.

Among the infections, fungal infections were the most common (18.2%), followed by viral (9.94%), parasitic infestation (6.75%) and bacterial (3.56%). Parasitic infestation and viral infection were found to be the predominant infections in the study performed by Sharma et al.⁵ and Nadia et al.,⁶ respectively. The difference in the findings may be

due to the variations in the climatic conditions and the place of study. A similar result was seen in the study conducted by Sharma et al., in which fungal infections were the most common (6.9%) followed by bacterial infections (5.6%)⁵ and study conducted by Hmar et al., in which fungal infections were the most common (13.6%) followed by bacterial (6.3%) and viral infections (5.7%).

In the study conducted by Nadia et al., viral infections were the predominant group (15.7%), followed by fungal (13.5%) and bacterial infections (10.8%).⁶ The prevalence of parasitic infestations in our study was 6.75 % which was lower (17.03%) than the study conducted by Hmar et al., in north east India.¹⁴ Scabies (5.71%) was the most common among parasitic infestations followed by pediculosis (1.04%). But in study conducted by Kalaiselvan et al., (school based study) pediculosis was found to be more common than scabies which reflects the difference in patterns observed in hospital and community settings.

The prevalence of pediculosis (1.04%) was low in our study. This may be due to increasing awareness regarding hair hygiene. The incidence was higher in girls as compared to boys probably due to their long hair length. This was in accordance with the study by Sharma et al.⁵

Dermatophytosis and pityriasis versicolor were the most common fungal infections, and among viral infections, verrucae and pityriasis rosea were the most common in our study.

Lack of health awareness, ignorance regarding the disease, failure to understand the importance of personal hygiene, cleanliness, overcrowding, increased exposure and outdoor activity could have contributed to the higher prevalence of bacterial, viral, fungal infections and parasitic infestations in our study. In order to prevent the occurrence of infections, the importance of personal hygiene must be emphasized among general population. General advice like regular bathing, avoidance of tight clothing, sharing of towels and soaps should be given. The environment must be kept dry and bright to avoid fungal infections as the fungi live in dark and damp places. Importance of healthy diet in preventing skin diseases should be conveyed to the patients.

ACNE vulgaris

The next most common condition was acne which was seen in 17.1% of the study population. As our study group included patients in the adolescent age, a higher incidence of acne was found. Similarly, in a study by Ferreira et al., in south-eastern Brazil, acne was found in 9.9% of the adolescents.⁸ Kalaiselvan and Karthikeyan found acne in 16.1% of the adolescent study population.⁷ Sharma et al.⁵ found acne in 12.5% of the adolescent patients.

Another study in Hong Kong by Yeung et al.⁹ the prevalence of acne was 14.6% among the adolescent population.

Androgens play a major role in development of acne. Sebaceous glands are specific targets for androgens. They are active at birth due to maternal hormone influence and then remain inactive till 9-12 years. Neonatal lesions related to circulating maternal hormones occur. At puberty, the spurt of hormones especially of androgens, stimulate sebaceous glands to secrete sebum. So in adolescence there is increased oiliness in areas with maximum sebaceous gland like scalp, face and upper trunk resulting in greasy hair and face.¹⁰

To prevent acne, people are advised to exercise regularly to increase circulation to your skin and shower as soon as possible after every exercise session, as the sweat can build up and clog the pores. Face must be washed twice every day to prevent pimples, blackheads and whiteheads. Use of water-based skin care products and cosmetics or products marked "noncomedogenic," which means they won't clog the pores is advised. It is better to avoid skin care products that contain oils or lanolin.

Dermatitis

The prevalence of dermatitis was 13.5% in our study. In this group, the incidence of polymorphic light eruptions was 4.45% and eczema was 2.89%. The incidence of seborrheic dermatitis was 1.63% and pityriasis alba was 1.56%.

In the study by Sharma et al., dermatitis was seen in 27.3% of the study population. Eczema was present in 6.1%, seborrheic dermatitis in

8.1%, pityriasis alba in 4.9%, and atopic dermatitis in 3.4% of the patients.⁵

The Prevalence of contact dermatitis in our study was 0.82%. According to the study by Duarte et al.²¹ in Brazil, the main location of the contact dermatitis was the face. The substances with higher frequencies of sensitization were nickel sulfate in patients and tosylamide-formaldehyde resin in patients.

Prevention is by avoiding anything that tends to aggravate your eczema. Common environmental irritants include soaps, bubble baths, shampoos, solvents, wool, nylon, grass and sand. Regular use of moisturizers also help in preventing eczema.

Regular use of anti-fungal shampoo and soap for the scalp and body respectively can help in preventing seborrheic dermatitis.

Pigmentary Disorders

- The prevalence of pigmentary disorders was 3.71%. Vitiligo was seen in 1.85% of patients and post inflammatory hyperpigmentation in 1.19%.
- According to Sharma et al.,⁵ the incidence of pigmentary disorders was 6.1% in the adolescents, most common conditions being vitiligo, freckles and post inflammatory hyperpigmentation.
- Pinto et al.,¹¹ in Connecticut found that the most common pigmentary disorders in adolescents were vitiligo and nevus depigmentosus.
- Another study by Sanfillippo et al.,¹² in USA also found that vitiligo was the most common pigmentary disorder in adolescents.
- Pigmentary disorders can be prevented by minimizing sun exposure, regular use of physical and chemical; sunscreens, decreased handling and early treatment of inflammatory lesions.

NAEVI

Naevi disorders were found to be in 1.56% of the total adolescent population. The most common nevi were nevus depigmentosus, linear epidermal nevus constituting 0.37% of the total population each, followed by becker's nevus (0.3%) and nevus of ota (0.15%) and nevus comedonicus (0.15%). The study done by Hmar et al.,¹⁴ reported a lower prevalence of nevi in 0.5% of the study population and in another study conducted by Ayanlowo et al.,¹⁵ it was observed in 0.3% of the population. Naevi like naevus depigmentosus has to be differentiated from Hansen's disease for preventing unnecessary stigma and fear among adolescents and other naevus disorders are of major cosmetic concern for adolescents. Hence appropriate treatment modalities must be offered for adolescents.

Papulosquamous Disorders

The prevalence of papulosquamous disorders in our study was 4.23%. It was similar to the study conducted by Ayanlowo et al.,¹⁵ in which papulosquamous disorders were observed in 2.3 % of the adolescents while in contrary study conducted by Hmar et al., showed a lower incidence of psoriasis (1.74%).¹⁴ Among the papulosquamous disorders, the most common disease was psoriasis (1.64%) followed by lichen planus (0.89%). While in the study conducted in United Kingdom by Gelfand et al.,¹⁸ psoriasis was observed in 1.3 % of adolescents and study conducted by Sharma et al., showed a incidence of 0.4%.

Keratinisation Disorders

The prevalence of keratinisation disorders in our study was found to be 4.75 % which was higher than study conducted by Henshaw et al., with a incidence of 1.7%. The most common diseases in this group are milia (0.89%) followed by Phrynoderma (0.82%) and keratosis pilaris (0.74%), ichthyosis (0.59%), acanthosis nigricans (0.59%) palmoplantar keratoderma (0.37%) and porokeratosis (0.22%). While the most common disease observed in this group in the study by Henshaw et al., was Keratosis pilaris (0.9%) followed by ichthyosis (0.5%), phrynoderma (0.4%) and palmoplantar keratoderma (0.2%).¹⁷

The diseases observed under the ichthyosis group were ichthyosis vulgaris (3%), lamellar ichthyosis (1) and erythrokeratoderma variabilis (1).

The 1.3% prevalence of phrynoderma in our study population has given us an opportunity to find out associated nutritional disorders like Vitamin (Vit) A, Vit B-complex, Vit E and Essential fatty acid (EFA) deficiency as well as protein-calorie malnutrition among the population.¹⁹ Hence it is important for clinicians to know other skin and

extracutaneous manifestations of nutritional deficiencies for prompt diagnosis and treatment and referrals if needed. Patients with ichthyosis should be advised about the chronicity of illness and importance of moisturisers in alleviating the symptoms.

Hamartoneoplastic Syndromes

In our study hamartoneoplastic syndromes were observed in 6 patients (0.45%) equally shared by neurofibromatosis and tuberous sclerosis (0.22% each). This was similar to the study conducted by Ayanlowo et al., in which neurofibromatosis and tuberous sclerosis were observed in 0.5% and 0.2 % respectively.¹⁵ The clinical presentations of tuberous sclerosis varies with age. In ante- or perinatal period only cardiac or cerebral lesions can be detected. Infants develop early epilepsy type West syndrome. In children aged 2 to 10, neurological involvement is common (epilepsy, intellectual disability, autism). The forms of the adolescent are similar to those of the adult, thus must be screened for possible renal or pulmonary involvement in parallel with the neurological follow-up.²⁰

Appendageal Disorders

In appendageal disorders group, hair disorder was the most common (2.82%) followed by sweat gland disorders (2.3%) and nail disorders (0.59%). Paronychia (4 cases), miliaria (13 cases) and alopecia areata (18 cases) were the most common diseases in nail, sweat gland and hair disorders respectively.

In our study nail disorders were seen in 0.59% of adolescents with the most common disease being paronychia, observed in 4 patients (0.3%). It was in accordance with the study conducted by Hmar et al.,¹⁵ and almost similar to the study conducted by Henshaw et al.,¹⁵ in which the prevalence was observed to be 1.09% and 0.5 % respectively. The most common nail disorder observed in study conducted by Henshaw et al.,¹⁵ was nail dystrophy.

In our study, the prevalence of hair disorders was 2.82%, which is similar to the finding of a previous literature.⁵ A similar result was reported by Sharma et al.,⁵ who found alopecia areata in 2.1%. The prevalence of sweat gland disorders in our study was 2.3 %. It was in accordance with the study conducted by Sharma et al.,⁵ with incidence of 1.4 %. The most common sweat gland disorder observed in our study was hyperhidrosis (1.11%) followed by Miliaria(0.96%). The most common sweat gland disorder observed in the study conducted by Henshaw et al.,¹⁵ was also miliaria but reported a higher prevalence of 6.5%. The prevalence of hyperhidrosis in the study by Adar et al., was 0.6-1%¹⁶ which is almost similar to that observed in our study.

URTICARIA

Urticaria was present in 3.64% of the patients. According to Varonier et al.,¹³ the incidence of urticaria among adolescents was 0.4% to 0.9% where as Sharma et al.,⁵ found urticaria in 5.4% of adolescents.

Sex Distribution Of Various Dermatoses:-

Infections were predominantly seen in males (37.51%) when compared to females (26.27%). This may be attributed to more extensive outdoor activity and physical exposure to infectious agents among males.

Similar result was seen in the study by Sharma et al.,⁵ where infections were more common among the male patients. But Ferreira et al.,⁸ found infections to be more prevalent among the female patients. Acne were more prevalent in male patients.

Almost all other dermatoses like Appendageal disorders, keratinisation disorders, keloids, dermatitis, pigmentary disorders, and insect bite reaction, were more commonly seen in females compared to males. Papulosquamous disorders and urticaria were almost equally distributed among both the sexes.

CONCLUSION

The Following Conclusions Can Be Drawn From The Study:

- Males (717) outnumbered females (628) in the study.
- The most common dermatoses were infections.
- Among these, fungal infections were the most common, particularly dermatophytosis.
- Among the fungal infections, dermatophytosis were most commonly prevalent followed by pityriasis versicolor.
- Viral infections were the second most common among the infections, in which verrucae and pityriasis rosea were

predominant.

- Parasitic infections were the third most common among the infections, particularly scabies. Pediculosis was less prevalent compared to the previous studies.
- Bacterial infections were the least common.
- The increased prevalence of the above infections can be attributed to poor personal hygiene, overcrowding, increased outdoor activities, and lack of health awareness among the community.
- The other most common dermatoses among the study group was acne vulgaris similar to almost all the previous studies.
- Next most common group of dermatoses was dermatitis which included the inflammatory diseases. polymorphic light eruptions was the most common in this group.
- Other common inflammatory diseases seen were seborrheic dermatitis, Non specific eczema, atopic dermatitis and pityriasis alba.
- Increased secretion of sebum at the onset of puberty can be attributed to the high incidence of seborrheic dermatitis and increased exposure to the external environment especially during the peak hours of the day may be contributory in the increased incidence of polymorphic light eruptions.
- Among the pigmentary disorders, vitiligo was the most common condition.
- The next most common pigmentary disorder observed was post inflammatory hyperpigmentation. This may be a consequence of either infective lesions, or inflammatory lesions or acne lesions, all of which are the most commonly seen dermatoses in this study.
- Psoriasis was the most common papulosquamous disorder followed by lichen planus and pityriasis rubra pilaris.
- Among the appendageal disorders, alopecia areata was the most common condition followed by hyperhidrosis.
- There was an increased incidence of telogen effluvium (0.82%), probably emphasizing the role of stress and malnutrition among the adolescents.
- Urticaria was seen in 3.64% of the study population which can be a major source of disability for an adolescent at the work place or, in general, daily life.
- Keloids and insect bite reactions were the other commonly seen adolescent dermatoses.
- Infections, Acne vulgaris were more commonly seen among the male patients.
- Appendageal disorders and keloids, dermatitis, pigmentary disorders, insect bite reactions were more commonly seen among female patients.
- Papulosquamous disorders and urticaria were equally distributed between males and females.

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