IJBPAS, May, 2025, 14(5): 2728-2743

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

SOCIO-ECONOMIC, DEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF PSORIATIC PATIENTS ATTENDED DERMATOLOGY OUTPATIENT CLINIC AT: A TERTIARY CARE HOSPITAL OF MEERUT

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Received 16th Jan. 2024; Revised 20th Feb. 2024; Accepted 13th July 2024; Available online 1st May 2025

https://doi.org/10.31032/IJBPAS/2025/14.5.9003

ABSTRACT

Aim: Psoriasis is a chronic disease and has been found very difficult to manage. The study aims to evaluate possible association of the clinical characteristics of Psoriasis with epidemiological features of the patients.

Methods: The physical, clinical examination, socio-economic and socio-demographic parameters were recorded from the consenting patients. Frequency, percentage, mean and standard deviation (SD) were calculated. Statistical analysis was performed through SPSS version 25. Inferential statistics was performed by the use of Z- test. Data were analyzed using Pearson chi-square test, Pearson correlation and independent t-test. The statistical significance was accepted as $p<0.05$.

Results: 96 patients (58 males, 38 females) attending dermatology OPD were included in the study. The mean age of the patients was 37.93 +/- 14.8 years. The average age of onset of the disease is found 33.1 years in male and 29.2 year in females. Family history was positive in 19.79% of the patients. 68.75% the participants were having a normal BMI. On DLQI score 69.79% replied with moderate severity of disease. The risk of developing psoriatic arthritis with a positive family history of the disease was 20.8%. The risk of developing psoriatic arthritis was observed greater as disease prolongs. All of PsA patients reported to be affected with a BSA score of 2% or larger.

Conclusions: The socio-demographic and enriched clinical data of psoriasis highlight the features that should be considered, especially in follow-up outpatient clinics. Patients showing an early onset of the disease should be investigated for severe involvement.

Keywords: Psoriasis, Demography, DLQI, BMI, BSA, PsA

INTRODUCTION

Psoriasis, a common chronic immune mediated inflammatory skin disorder usually characterized by plaques with silver scales and erythematous papules, associated with significant morbidity and is a substantial economic burden to both patients and the healthcare system. It affects 1 - 3 % of the general population of all ages and genders, with incidence peaking in between the ages of 15 and 30 years **[1]**.

In India, the psoriasis prevalence ranges from 0.44 to 2.8% **[2, 4]**. With a male predominance (1.9:1) chronic plaque type is most common. Highest involvement was observed at trunk. A positive family history was reported in 14.2% **[2, 3]**. Joints, nails and skin all can be affected by psoriasis **[5]**. At present, the data on the prevalence of psoriasis there is a paucity of data related to epidemiology, disease types, associations, severity amongst Indian patients with psoriasis **[6]**.

This study, intended to examine and contribute to establish relationship between the socio-demographic data with clinical data by comparing and contrasting various parameters including; gender and age of the patients, age of onset of the disease, presence of family history, Body Mass Index (BMI) and its possible association with the pattern and severity of disease, percentage of involved Body Surface Area (BSA), presence or absence of psoratic arthritis (PsA) amongst the patients visiting dermatology outpatient Department of Chhatrapati Shivaji Subharti Hospital (CSSH), Swami Vivekanand Subharti Univesity (SVSU), Meerut.

METHODOLOGY

This was a cross sectional study and clinic based study where study participants were from Western Uttar Pradesh such as Meerut and its adjoining areas. A total of 96 patients during October 2021 - March 2022, who visited dermatology OPD of CSSH, SVSU, Meerut. The only inclusion criterion was represented by a diagnosis of mild-to-severe psoriasis performed at least in the last 6 months. Patients with visual or hearing disability were excluded. For minor patient, the consent was obtained from the parents/guardians accompanying them.

Study design was based on data collection obtained from patients and dermatologists. To have an adequate number of subjects, the maximum number of participants was considered as the base for minimum number of subjects. Data collection from eligible patient was conducted in relation to their age, gender, education, income, disease onset age, family history, BMI, BSA, PsA, DLQI, etc. A unique code was assigned to each patient to maintain animosity. All data were computerized at the coordinating center. The study was approved by the Institutional Ethics Committee (IEC).

ANALYSIS

The statistical analysis was conducted using SPSS 25. Descriptive statistical methods were used to summarize and tabulate the different socio-demographic and clinical parameters of the studied sample. Inferential statistics was performed by the use of Z- test of one proportion for dichotomous variables (gender, age at onset and family history of psoriasis). Other variables were calculated as frequency, percentage, mean and standard deviation (SD). Data were analysed using Pearson chi-square test, Pearson correlation, independent t-test, and one way analysis of variance (ANOVA) test. At 95% Confidence Interval, p value < 0.05 was considered to be statistically significant.

RESULTS

Incidence and age of onset Psoriasis:

The average age of the patients participated in the study was reported as 37.93 years (+/- 14.8), where N=96. The average age of male participants in the study was 40.25 years (+/- 14.56) found higher in comparison to female patients with an average age of 34.39 years (+/- 14.57). The incidence of disease in males observed was 60.42% in comparison to 39.6% females. It suggests a higher incidence although it lesser than double that

has been reported in previous studies.[2] Average age of onset of Psoriasis was also reported higher in males at 33.12 years than females at 29.2 years **(Table 1)**.

About half of the patients 47.9% were from middle age group between 21-40 years. Another peak was observed between 11-20 years & 41-50 years with about 18% of patients from each age group. Highest numbers (65.6%) of patients with a BSA of 1 or more belong to the age group of 21-50 years, correlating closely with peak years of incidence and further **(Table 2)**.

Association of average age of the participants with their Psoriasis Severity:

The severity of disease and number of patients directly correlates with increase in the average age of the participants. It signifies a role of age in the disease progress to be explored in future studies **(Table 3)**.

Incidence of Psoriasis among the participants with Positive Familial Psoriasis:

About 20% of the Psoriasis patients in the study reported a Positive family history of Psoriasis. Males reported a family history double to the female participants **(Table 4)**.

Incidence of Psoriatic Arthritis (PsA) among the study participants:

21% of the patients reported to be suffering from PsA. Almost a similar percentage of both genders were affected with PsA **(Table 5)**.

All of the 20 participants of Psoriatic Arthritis reported a moderate to extreme severity. Also, it was observed that patients diagnosed with PsA have been suffering from the disease for an average of 7.6 years in comparison to patients without PsA of 6 years.

7 (36.5%) out of 19 Psoriatic participants reported to have a positive family history of Psoriasis. Although another study with a larger number of PsA shall be conducted in future to have a better understanding of the same.

Difference in Education level in comparison to the Gender of the participants:

In total, 63.54% of the participants reported their education level below graduation. Male study participants reported having higher education levels than female counterparts. The gap between male and female was higher in higher studies.

82.2% (79 Nos.) the patients reported moderate to extreme severity of the disease, out of them 62.2% (51 Nos.) participants were educated below graduate level. The study data revealed that lower level of

education can be implicated with higher degree of Psoriasis severity **(Table 6)**.

Incidence of Psoriasis in comparison to Body Mass Index (BMI) of the patients:

A higher BMI is an established risk factor for Psoriasis. But, this study recorded that about 68.7% of the patients were having a BMI in normal range. The body weight of 20% patient's was found above normal BMI levels. About 11% of the participants were reported underweight. An abnormal BMI does not seem to be associated with larger BSA.

Income vs BSA vs Psoriasis severity (DLQI):

A comparatively higher number of patients were reported with higher BSA score in the income group of <20000. Statistically significant Increment in severity of Psoriasis is reported that was directly proportional to the increase in BSA involvement **(Table 7)**.

Severity of Psoriasis sub-types:

Chronic plaque type was the most common diagnosis (45.8%) followed by PsA (20.8%), Guttate (16.6%), Erythroderm and Scalp (both 13.5 % each), Palmar and Nail (both 10.4% each), Plantar (5.2%) and SeboPsoriasis (2%).

There was no difference observed in the severity among the types and more than 80% of the patients of all Psoriasis sub-types are reported suffering from moderate to extreme severity **(Table 8)**.

Incidence of Body parts affected with Psoriasis:

Lower leg is the most common (1/3 rd) part affected with Psoriasis. Next to that, upper body parts were reported more involved with Psoriasis in comparison to lower body parts. Lower leg and upper body parts were also affected with higher severity of Psoriasis in comparison to other body parts.

Table 1: Incidence and Age of onset of Psoriasis

Age in years	Male	%	Female	%	Total	%
< 10	0	0	1	1.04	1	1.04
11-20	4	4.17	7	7.29	11	11.46
21-30	14	14.58	9	9.38	23	23.96
31-40	13	13.54	8	8.33	21	21.88
41-50	14	14.58	8	8.33	22	22.92
51-60	7	7.29	3	3.13	10	10.42
61-70	6	6.25	2	2.08	8	8.33
Grand Total	58	60.42	38	39.6	96	100
MEAN +/- SD	40.25 +/- 14.56		34.39 +/- 14.57		37.93 +/- 14.8	
Average Age of ONSET (Yrs)	33.12 +/-14		29.28 +/-14.88		31.6	

Table 2: Incidence and BSA of Psoriasis according to age group

GENDER	ONSET AGE						Total
	<= 10	11. - 20	21 - 30	31 - 40	41-50	51+	
Female	3	8	11 (29%)	6 (15.7%)	6	4	38
Male	2	9	14 (24%)	15 (25.8%)	12	6	58
Total	5	17	25	21	18	10	96
% of Total	5.20%	17.70%	26.00%	21.90%	18.80%	10.40%	100.00%
BSA	<= 10	11. - 20	21 - 30	31 - 40	41-50	51+	Total
<1%	0	2	0	1	2	0	5
1-2 %	0	1	6	4	6	1	18
3-10 %	0	5	13	10	12	13	53
>10 %	1	3	4	6	2	4	20
Total	1	11	23	21	22	18	96

Table 3: Average age and Psoriasis severity

Severity (DLQI)	Average of AGE (Years)	Number of Participants
No effect	25	1
Mild	36.6	16
Moderate	37.4	33
Severe	39.3	34
Extreme	38	12
Grand Total	37.9375	96

Table 4: Incidence of Psoriasis with positive family history

FAMILY HISTORY	GENDER		Total	% of Total
	Female	Male		
No	32	44	76	79.20%
Not sure	1	0	1	1.00%
Yes	5 (13%)	14 (24%)	19	19.80%
Total	38	58	96	100.00%
% of Total	39.60%	60.40%	100.00%	

Table 5: Incidence of Psoriasis with positive family history

PsA	GENDER		Total	% of Total
	Female	Male		
No	28	47	75	78.10%
Unsure	1	0	1	1.00%
Yes	9	11	20	20.80%
% of Total	39.60%	60.40%	100.00%	100.00%

Table 6: Severity of Psoriasis according to Gender and Education level

EDUCATION	No effect	Mild	Moderate	Severe	Extreme	Grand Total
Primary school		3	13	9	5	30
High school		7	8	14	2	31
Graduate	1	6	11	10	5	33
Master's			1	1		2
Grand Total	1	16	33	34	12	96

Table 7: Comparison of Income, BSA & DLQI

INCOME	BSA				Total	% of Total
	<1%	2-3 %	3-10 %	>10 %		
<5000	0	4	4	2	10	10.42%
<10000	1	8	24	4	37	38.54%
<20000	2	4	19	9	34	35.42%
<40000	0	2	5	5	12	12.50%
<50000	2	0	1	0	3	3.13%
Total	5	18	53	20	96	100.00%
% of Total	5.20%	18.80%	55.20%	20.80%	100.00%	
Severity (DLQI)	<1%	1-2 %	3-10 %	>10 %	Total	% of Total
Extreme	0	0	5	7	12	12.50%
Severe	0	3	19	12	34	35.40%
Moderate	3	7	22	1	33	34.40%
Mild	2	7	7	0	16	16.70%
No effect	0	1	0	0	1	1.00%
Total	5	18	53	20	96	100.00%
% of Total	5.20%	18.80%	55.20%	20.80%	100.00%	

Table 8: Incidence and Severity of Psoriasis sub-types

Diagnosis	No effect	Mild	Moderate	Severe	Extreme	Total	Remarks
Chronic plaque		9	13	16	6	44 (45.8%)	9+35 (79.5%)
PsA			6	10	4	20 (20.8%)	0+20 (100%)
Guttate		2	6	6	2	16 (16.6%)	2+14 (87.5%)
Erythroderma			1	9	3	13 (13.5%)	0+13 (100%)
Scalp		3	7	2	1	13 (13.5%)	3+11 (84.6%)
Palmar		1	5	3	1	10 (10.4%)	1+9 (90%)
Nail	1	1		4	4	10 (10.4%)	2+8 (80%)
Plantar			2	2	1	5 (5.2%)	0+5 (100%)
SeboPsoriasis			2			2 (2%)	0+2 (100%)
Total	1	16	42	52	22		

DISCUSSION

A prospective, cross-sectional, disease epidemiological study was conducted on the patients with Psoriasis; those were registered at dermatology OPD of CSSH, SMC, SVSU, Meerut.

Epidemiological profile of the participants

60.42% of the participants were males while 39.6% were Female. The average age of the overall (both male and female together) participants was 37.93 +/- 14.8 years. About half (47.9%) of the patients were from the age group of 21-40 years followed by 18% (approx) each from 41-50 year age group and 11-20 year age group. The severity of the disease (DLQI score) and the number of patients increases with age. Both gender reported a similar level of severity on DLQI score. The disease severity was not affected by positive or negative family history.

The average of male patients 40.25 years (± 14.56) was found higher to female patients with an average age of 34.39 years (± 14.57). Also, the average onset age of male patients was Male 33.12 years (±14)

higher than that of females 29.28 years (±14.88). Hence, females are being affected with Psoriasis at a younger age than the males. But, the incidence of Psoriasis is higher in males.

21% of the participants were reported to be suffering from Psoriatic arthritis (PsA). On an average PsA were reported suffering from the disease since 7.6 years in comparison to Non-PsA patients with 6 years. Almost all of the PsA patients reported with a disease severity of moderate to extreme on DLQI score. They also reported a BSA involvement of 2 or more. PsA affected both genders equally and was not affected by age of onset of the patients and family history.

Male participants showed a higher education level than females and the difference was still bigger in higher studies. A lower level of education was directly associated with higher severity of Psoriasis on DLQI score.

The Body Mass Index (BMI) of 68.7% of the patients was normal. A higher BMI was not found significantly associated with BSA or DLQI scores.

More than half (55%) of the patients were observed suffering with a BSA of 3-10%. Highest BSA% was observed in the ONSET age group of 21-50 years. BSA does not seem to be affected by age group, residence, education of the participants. A lower income was found associated with a higher BSA score. A higher BSA was directly associated with a higher severity significantly.

A lower income group < Rs 10,000/- PM displayed comparatively higher severity. The disease seems to be more aggressive around first five years and thereafter it showed a decline may be attributed to medical intervention. Chronic plaque type was the most common diagnosis (34.9%) followed by PsA (15.8%), Guttate (12.6%), Erythroderm and Scalp (both 10.3 % each), Palmar and Nail (both 7.9% each), Plantar (3.9%) and SeboPsoriasis (1.5% each). Lower leg and upper body parts were affected with higher severity of Psoriasis in comparison to other lower body parts.

Base line characteristics:

A total of ninety six patients who were in the age group of 4 – 70 years, with the mean age of 37.93 years ± 14.8 were screened and analyzed to identify the epidemiological features of psoriasis. The mean age of participants in the present study was observed slightly lower to the mean age of age of 40.14 ± 13.87 years

reported in the previous study at the same locale **[7]**.

The average age of male patients 40.25 years (± 14.56) was found higher to female patients with an average age of 34.39 years (± 14.57). Also, the average onset age of male patients was Male 33.12 years (±14) higher than that of females 29.28 years (±14.88). Earlier, a lower mean age of onset was reported in male as 30.79 years and females 22.5 years in eastern Uttar Pradesh **[8]**.

Nevertheless, females are being affected with Psoriasis at a younger age than the males. But, the incidence of Psoriasis is higher in males. The reason behind higher number of reporting's in male patients may be due early seeking of medical care.

Determination of age at onset is a problematic issue for researchers due to the followings: first, it relies on patient's recall; second, date of first diagnosis doesn't reflect the onset as many patients suffer long time before seeking medical care. Smith *et al* **[9]** postulated that psoriasis has a bimodal peak of activity.

Although psoriasis may occur from birth to advanced ages, most of reviewed literature **[10]** including the present study suggested that 2nd and 3rd decade (21-40 years) to represent peak of onset.

Approximately half (47.9%) of the patients were aged between 21-40 years. A lesser peak was observed in the age groups of 11-20 years & 41-50 years with about 18% patients from each age group. The severity of disease and number of patients directly correlates with increase in the average age of the participants. It signifies a role of age in the disease progress to be explored in future studies.

There is remaining controversy regarding psoriasis gender preponderance and it lies between no differences to male preponderance. The current study supports the opinion of male predominance at 1.5:1 was slightly lower to 1.92:1 reported in previous study at the same research locality **[7]**. The incidence of disease in male (60.42%) was higher than the females (39.6%), although it was lower than double as observed in few previous studies.

Education:

About 63.54% of the participants were educated below graduation level. Female participants reported a lower education levels than the males and the gap was higher in higher studies. Participants with lower education levels reported a delayed development (higher average age

and higher age of onset) of disease, and were comparatively in greater numbers when compared to the participants with higher education levels. That might have resulted in a delay in seeking of medical help.

The urban location of the study centre can be attributed to a good number of higher educated participants as well. Higher mean age at diagnosis and onset of the patients with lower level of education can be due to a delayed approach to medical care and diagnosis. Also, modern life style and stress factor may be contributing to the lower age of onset of disease in educated people. The data highlights an unsatisfactory disease control. It also signifies nature of the gradual progression of the disease and a probable resistance towards the prescriptions in use.

Family history:

Familial clustering in psoriasis had been observed for many years **[11]**. A positive family history in 34.4% of the studied sample provided another support of this concept. Moreover, it confirmed the important role of genetics in the etiology of psoriasis especially in those with early onset **[12]**. The study figure is again lower to the figure of 38.5% reported few years ago at the same locale **[7]**.

About 20% of the participants reported a positive family history of Psoriasis. A higher percentage of Males (24%) reported a positive family history in comparison the female (13%). It is also observed that a positive family history does not seems to affect the onset age of the psoriasis, and only 5.2% of the participants reported an early diagnosis below the age of 10 years. Hence, it can be assumed that Psoriasis is a complex disorder with multi risk factors involved and not merely dependent on the genetics and affecting individuals outside of the family tree.

Income:

As the income grows, the number of the patients showed a decline. It can be attributed to appropriate medical interventions. A similar study shall be repeated for a fairer understanding of the relationship of disease with family income in metro cities with a special reference to middle and higher income group Psoriasis patients.

Disease Characteristics

Body Mass Index (BMI):

Higher BMI increases the risk of psoriasis **[13]**. Obesity is considered to contribute to the pathogenesis of inflammatory skin diseases like psoriasis **[14]**.

In the present study, about 68.7% of the study participants displayed a BMI within normal range, while 11% were underweight. The BMI was found unrelated statistically with the education level of the participants. More than 75% of the participants across all weight groups reported to be suffering from moderate to severe symptoms of the disease. The age of onset and BSA doesn't not seem to relate significantly with BMI of the participants. It seems to be alarming that Psoriasis is able to bypass the important trigger factor of obesity and affecting individual with normal BMI as well.

Body Surface Area (BSA):

In a recent study among Canadian dermatologists reported, approximately 50% of patients have a BSA of < 3% and 78% of patients have a BSA of < 10%, with only 2% having a BSA of > 50% **[15]**.

More than half (55%) of the patients in present study were observed suffering with a BSA of 3-10%. Highest 65.6% of the patients with a BSA of 1 or more belong to the age group of 21-50 years which closely correlates with the peak years of Psoriasis incidence. BSA was found not significantly associated with age group, area of residence, educational level of the patients. However, a significant number (81.25%) of participants having BSA of 2 or more belong to an income group of <20000 rupees per month. Also, a statistically significant increment in Psoriasis Severity on DLQI scale was observed along with increase in BSA involvement.

Dermatological Life Quality Index (DLQI):

The quality of life of the psoriasis patients, who associated their symptoms with the disease, thought that they were adversely affected by the disease, and who saw personal attributions as the cause of the disease was negatively affected. The quality of life of patients who thought that their disease could be kept under control and who understood their disease was positively affected **[16]**.

Psoriasis severity (DLQI) was not found affected by area of residence of the patients. Patients residing in cities as well as villages have reported an almost similar percentage (82.2%) of moderate to Extreme disease severity indicating unsatisfactory level of relief from the disease. The severity (DLQI) of Psoriasis showed a decrease with an increase in disease years. Again, this can be due to medical intervention provided to the individual. Nevertheless, with more than 80% of unsatisfactory disease control, Psoriasis remains a severe and troublesome

disease. Only about 17.7% (17 Nos.) of the patients reported satisfactory diseases control on DLQI questionnaire.

Disease severity:

Objective assessments of BSA and PASI alone, when excluding DLQI, may not fully capture the impact of disease severity **[17]**.

About 82.2% (79 Nos.) of the total study participants (almost equal % of male & female), reported to be suffering with moderate or higher severity of the disease on DLQI scale. It displays that the agony of disease has been impacted equally to all of its sufferers highlighting need to address the disease on priority basis. Out of 82.2% patients; those reported moderate to extreme severity of the disease, 62.2% (51 Nos.) participants were educated below graduate level. The study data revealed that lower level of education can be implicated with higher degree of Psoriasis severity.

Psoriatic arthritis:

The clinical manifestations of psoriasis are heterogeneous, ranging from limited to very extensive disease. he present study to some extent is in agreement with US study. Minor difference may be due to variation in the severity assessment between researchers (due to lack of standardized severity assessment method) and variation in the course of disease (due to the nature of psoriasis to wax and wane).

Turan *et al*. **[18]** found joint involvement in 14.5% of their patients, whereas Gamonal et al.[19] found joint involvement in 24.3% of their patients. In present study, 21% of the participants were affected with Psoriatic Arthritis (a similar percentage of both genders) was observed. An early onset age does not seem to be associated with the development of PsA among the participants. 7 (36.5% out of 19 Psoriatic participants reported to have a positive family history of Psoriasis. A higher degree of Psoriasis Severity was observed for PsA patients on DLQI score. Also, PsA patients were suffering from disease longer duration (7.6 years) than non PsA patients (6.0 years). It means the longer the duration of the disease, the more chance of developing PsA. All of the PsA patients had been reported to be affected with a BSA score of 2 or larger.

Psoriasis Sub-types:

Chronic plaque type was the most common diagnosis (45.8%) followed by PsA (20.8%), Guttate (16.6%), Erythroderm and Scalp (both 13.5 % each), Palmar and Nail (both 10.4% each), Plantar (5.2%) and SeboPsoriasis (2%).

Lower legs and calf is the most common part affected with Psoriasis. Next to that, upper body parts were reported more involved with Psoriasis in comparison to lower body parts. Lower leg and upper body parts were affected with higher severity of Psoriasis in comparison to other lower body parts. Almost a similar percentage of disease severity noted both in married and unmarried patients.

CONCLUSIONS

Psoriasis is a multi systemic and multi-factorial disorder. World over and in India, the disease is showing a growing pattern. Males are predominantly affected but females tend to get affected in earlier age to males. The disease onset was also early in patients with positive family history. The disease displayed a peak during middle age 21-40 years and affects both with equal severity. Uncontrolled, severe and chronic cases are at risk factor for developing PsA. Psoriasis may be present on a particular site or can involve whole of the body. The most frequent site of involvement reported in the study was lower leg and upper body, most common diagnosis was chronic plaque followed by PsA and Guttate among other sub-types. Lower level of education, lower income, and higher BSA involvement displayed a positive association with disease severity on DLQI scores.

The studies suggest that psoriasis leads to significant psychosocial disability in the patients. The disease should be addressed while managing any patient by means of medical as well as supportive psychological and behavior therapy as well.

LIMITATIONS

The findings of this study should be cautiously used for generalization since it depicts one hospital in Meerut, Uttar Pradesh. Additionally, data being self-reported may not be actual hence further study is warranted.

Being a chronic and relapsing disease in nature psoriasis may co-exist with several other disease conditions those are excluded from the study. Further study is warranted to understand the contributory aspects of co-morbid conditions upon psoriasis, which is another major limitation of the study.

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