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Epidemiology and Comorbidities in Patients of Psoriasis: A Comparative Study

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Abstract

Background

Psoriasis is a chronic immune-mediated inflammatory disorder is characterised by epidermal hyper proliferation, abnormal keratinocyte differentiation. The inflammatory process during its chronic course predisposes the patients to multiple co-morbidities.

Aim

To assess epidemiology and co-morbidities in patients of psoriasis.

Materials and Methods

A hospital based comparative study was conducted involving 42 adult patients with psoriasis and 42 age- and sex-matched controls..

Results

Both groups included 26 males and 16 females. The mean age of the cases and controls were 39.67 years and 39.71 years, respectively. Eighteen (43%) cases had normal BMI less than 25, whereas, 22(52%) controls had BMI less than 25. 5 (12%) cases and 6 (14%) controls were overweight. 19 (45%) cases and 14 controls (33%) were obese. The mean BMI of our cases and controls was similar with no statistically significant difference ($p = 0.45$).

Introduction

Psoriasis is a chronic immune-mediated inflammatory disorder having significant implications for sufferers in terms of general wellbeing and enjoyment of life is characterised by epidermal hyper proliferation, abnormal keratinocyte differentiation.1 Substantial evidence has demonstrated its activity involving innate and acquired immunity with dendritic cells bridging this gap.2 It is regarded as T lymphocyte mediated inflammatory disorder characterised by hyper proliferation of keratinocytes in genetically predisposed subjects.3 Prevalence in western countries is estimated to be about 2–5%.4 In India it affects 0.44 to 2.8% of the population.5 The characteristic lesions of psoriasis are well demarcated erythematous plaques covered in silvery-white flaky scales. They can appear on any part of the body, but are most commonly found on extensors such as the elbows and knees, scalp, lumbosacral region, and umbilicus .The severity of psoriasis varies considerably amongst people, and within the same person over time, ranging from one or two plaques in very mild psoriasis, to a high percentage of skin coverage in severe cases 6Many factors contribute in the etiopathogenesis including family history of psoriasis and environmental factors like diet, stress, obesity, alcohol consumption and smoking8 . In this cross-sectional study we aim to study the of epidemiology and comorbidities in patients of psoriasis.

Aims and Objectives

To assess epidemiology and co-morbidities in patients of psoriasis.

Methodology

After obtaining institutional ethical clearance, 42 patients of psoriasis presenting to dermatology department of our tertiary-care hospital with effect from September 2018 to June 2020 and an equal number of age and sex matched controls without any dermatoses, were enrolled for the study. Exclusion criteria for participants in the study were age < 18 years, pregnancy, lactation and postpartum (up to 1 year), concomitant (other) chronic inflammatory or autoimmune disorders and for cases with psoriasis, therapies with radiation and oral /topical vitamin D during the last 3 months. After obtaining informed consent, data recorded in a proforma included age of onset, type of psoriasis and severity as per PASI, sun-exposure, skin type, BMI, family history, joint/nail involvement and history of smoking/consumption of alcohol. Fasting blood samples were tested for glucose and lipid profile. Statistical analysis was done using SPSS software, Version 23 (SPSS Inc., Chicago, IL, USA). Odds ratio (OR) was calculated as applicable and a two-tailed P < 0.05, was considered statistically significant.

Results

Baseline Characteristics

Table 1: Distribution of age in study and control group

Parameter	Cases (n=42)		Control (n=42)		Z value	P Value
	Mean	SD	Mean	SD		
Age (Yrs.)	39.67	12.36	39.71	12.32	0.0[1]	0.99

Table 2. Sex wise distribution of cases in study and control group

Sex	Cases	Control	Total
Male	26	26	52
Female	16	16	32
Total	42	42	84

Chi-square = 0, P=1

Presenting age group was from 18 years to 65 years. There is no significant difference of age in study and control group as P>0.05 i.e. mean age was same in both the group. (Table 1). There was a male preponderance with male: female ratio being 1.62:1.

Table 3. Occupation wise distribution of cases in study and control group

Occupation	Cases	Control	Total
Outdoor	19	17	36
Indoor	23	25	48
Total	42	42	84

Chi-square = 0.19, P=0.66

Table 4. Locality wise distribution of cases in study and control group

Locality	Cases	Control	Total
Urban	13	12	25
Semi urban	17	17	34
Rural	12	13	25
Total	42	42	84

Chi-square = 0.08, P=0.96

Occupation and Locality Distribution

Majority of the subjects (cases and controls) were from semi-urban setup (40.4%). The difference was not statistically significant (p=0.96). 19 (45%) and 17 (40%) among cases and controls were engaged in outdoor occupation and 23 (55%) and 25 (60%) among cases and controls were engaged in indoor activities (Table 4) with no statistically significant difference (p = 0.66).

Table 5. Skin type wise distribution of cases in study and control group

Skin type	Cases	Control	Total
3	9	10	19
4	18	17	35
5	15	15	30
Total	42	42	84

Chi-square = 0.08, P=0.96

Fitzpatrick type III, IV and V skin was observed in 19 (23%), 35 (42%) and 30 (36%) of total cases and controls.

Table 6. Sun exposure time wise distribution of cases in study and control group

Sun exposure time	Cases	Control	Total
>30 min/day	22	26	48
<30 min/day	20	16	36
Total	42	42	84

Chi-square = 0.78, P=0.38

Twenty-two (52%) and 26 (62%) in cases and controls had >30 minutes of sun-exposure/day and 20 (48%) cases and 16 (38%) controls had <30 minutes of sun-exposure/day.

Behavioural Patterns of Study Subjects

Table 7. Behavioral pattern distribution of cases in study and control group

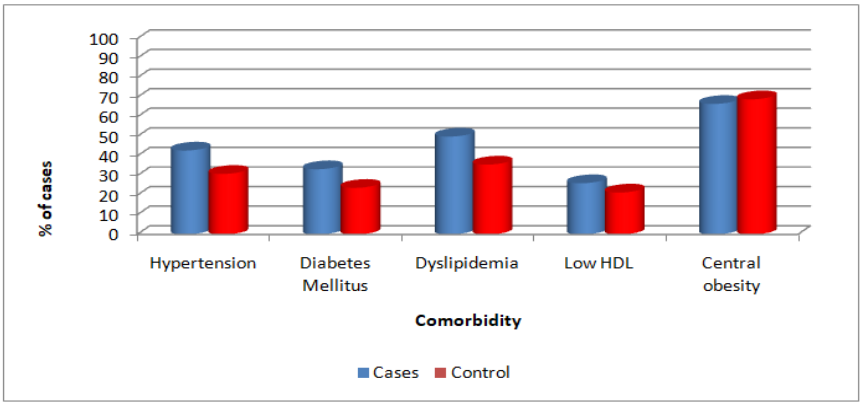
Habits	Cases (n=42)	Control (n=42)	Z Value	P Value
Smoking	6 (14.29)	8 (19.05)	0.59	0.56
Alcohol consumption	10 (23.81)	12 (28.57)	0.50	0.62

There was a total of 14 smokers & with no statistical significance (p = 0.56) between cases and control while 10 (24%) cases &12 (29%) controls gave history of alcohol consumption (p = 0.62).

3. Co-Morbidities in the Study Group

Table 8. Comorbidity wise distribution of cases in study and control group

Comorbidity	Cases (n=42)	Control (n=42)	Z Value	P Value
Hypertension	18 (42.86)	13 (30.95)	1.14	0.25
Diabetes Mellitus	14 (33.33)	10 (23.81)	0.97	0.33
Dyslipidemia	21 (50)	15 (35.71)	1.34	0.18
Low HDL	11 (26.19)	9 (21.43)	0.51	0.61
Central obesity	28 (66.67)	29 (69.05)	0.23	0.82



Raised Blood Pressure

Eighteen (43%) cases and 13 (31%) controls had raised blood pressure or were on anti-hypertensive treatment.

Raised Fasting Glucose Level

Fourteen (33%) cases and 10(24%) controls had raised fasting blood sugar level or were on anti-diabetic treatment.

Raised Triglycerides

Twenty-one (50%) cases and 15 (36%) controls had hypertriglyceridemia or were on a treatment for dyslipidemia.

Reduced HDL Cholesterol

Eleven (26%) of the cases and 9 (21%) of the controls had low HDL levels or were on a treatment for dyslipidemia.

Central Obesity

Abdominal obesity was present in 28 (67%) cases and 29 (69%) controls.

Table 9. Body Mass Index wise distribution of cases in study and control group

BMI	Cases	Control	Total
Normal	18	22	40
Overweight	5	6	11
Obese	19	14	33
Total	42	42	84

Chi-square = 1.25, P=0.54

Eighteen (43%) cases had normal BMI less than 25, whereas, 22(52%) controls had BMI less than 25. 5 (12%) cases and 6 (14%) controls were overweight. 19 (45%) cases and 14 controls (33%) were obese.

Table 10. Comparison of Body Mass Index in study and control group

Parameter	Cases (n=42)		Control (n=42)		Z value	P Value
	Mean	SD	Mean	SD		
BMI	26.62	5.73	25.69	5.55	0.75	0.45

The mean BMI of our cases and controls was similar (Table 8) with no statistically significant difference (p = 0.45).

Discussion

Substantial evidence has correlated vitamin D deficiency with many chronic immune-mediated inflammatory disorders and autoimmune disorders like systemic lupus erythematosus, psoriasis, multiple sclerosis etc.[87] The immunomodulatory actions of vitamin D particularly in Th1 pathway is indicative of its effectiveness in treatment of Th1 mediated inflammatory disorders. Psoriasis is a Th1 mediated chronic inflammatory disorder which affects skin, joints, nails and has several systemic involvements.[88] Recent literature shows vitamin D deficiency in psoriatic patients more common in comparison to controls.[13-16] The inflammatory process during its chronic course predisposes the patients to metabolic syndrome (MS) and there is a higher prevalence of metabolic syndrome in patients of psoriasis.

Demographic Data

Our study shows that the mean age of cases and controls were almost similar(39.66±12.32) and (39.71±12.32). This was in concordance to that reported by Gutte et al.[45] In comparison to other studies the mean age was approximately 3 years lower than that reported from Spain[14,15] and around 10 years lower than that reported from Italy.[16] In our study there was male preponderance with male : female ratio being 1.62 : 1 which is a given as psoriasis is more common in males. Majority of our study subjects (40%) belonged to semi-urban area. The report by Orgaz- Molina et al in Spain was from an urban area[14]. Majority of our subjects(cases and controls) were involved in indoor occupation(57%). This can lead to decreased sun-exposure and hence, lower cutaneous vitamin D synthesis. The commonest skin type in our study was type IV (42%). Among the other published studies, Gisondi et al.[16] hadincluded white-skinned cases. Orgaz -Molina et al., in their study[14] included all the 6 skin types whereas a similar study by the same authors[15] included skin types II to IV. Chandrashekar[41] from Puducherry included only skin type V in his study(Table 28).

Table 28. Data analysis on demographic profile.

Parameters	Our study	Orgaz-Molina et al.[14]	Orgaz Molina et. al [15]	Gutte et al.[45]	Gisondi et al[16]	Chandrashekar[41]
Country	India (Pune)	Spain	Spain	India (Mumbai)	Italy	India (Puducherry)
Study period	September 2018- August 2020	July – August 2011	May – June 2011	June 2014	December 2000 - December 2010	April 2015
Matching (age &sex)	Done	Done	Done	Not done	Done	Done
Age-years (mean SD) Cases Controls	39.66±12.32 39.71 ± 12.32	45.57±9.96 45.89± 10.06	44.33± 8.71 43.95±11.3	41 42	51.9± 13.3 51.4 ± 7.0	44.6±12.0 43.9±11.2
Male: Female	1.62:1	1.3:1	1.9:1	1.08:1	1.7:1	33:10
Locality	Urban, semi-urban & rural	Not Applicable	Metropolitan	Not Applicable	Not Applicable	Not Applicable
Skin type	III, IV & V	I – VI	II-IV	Not Applicable	White-skinned	V

Sun-Exposure

The average sun-exposure in our study subjects were categorised as more or less than 30 minutes similar to the study by Gisondi et al.[16]They reported 77% cases and 76% controls having sun-exposure less than 30 mins/day whereas we had 48% cases and 62% controls with sun exposure less than 30 mins/day. Although 76% controls had minimum sun-exposure their vitamin D level was 37 ± 28 ng/ml whereas our control group had vitamin D level of only 24.08 ± 7.40 ng/ml. The Fitzpatrick skin type could probably play a role in this observation. Also, widespread difference in sun-exposure as a result of skin type, latitude, atmospheric components, time of day, season and type of clothing as well as age, obesity and the incidence of several chronic illnesses can lead to lower vitamin D levels.[74]Psoriatic patients have a tendency to cover their affected areas. This behavioural pattern, if continued for many years could result in diminished UV exposure with subsequent lower vitamin D levels. Therefore, psoriatic patients might be predisposed reduced serum vitamin D levels.[89]

Psoriasis Patient Profile

Disease duration ranged from 3 months to 15 years with mean duration being 5 (±4.33) years Twenty-nine (69%) cases belonged to type 1 psoriasis and 13 (31%) patients belonged to type 2 psoriasis. Filoni, A.,[89] reported a positive family history in 32.9% of their patients. In our study 7% patients had a positive family history. Seven percent of our cases had a history of psoriatic arthritis. Orgaz Molina et al., also observed prevalence of 7% for psoriatic arthritis. Gisondi et al., reported a much higher prevalence (40.7%) in their study. Both studies did not correlation of arthritis with vitamin D deficiency.[15,16] Sixty-nine percent of our cases showed nail changes and this data was analogous with the other Indian studies.

Limitations of the Study

Our study had a small sample size. Cases and controls were recruited over 2 years, hence seasonal variations could not be taken into consideration.

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