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PSORIASIS

A Statistical, Clinical and Laboratory Investigation of 255 Psoriatics and Matched Healthy Controls[1]

LARS HELLGREN

This study is based on 255 patients with extensive psoriasis admitted between 1953–1959 to the Department of Dermatology, Gothenburg, Sweden. The aim of the investigation was to study psoriasis from a clinical and laboratory standpoint comparing a series of psoratics with apparently healthy, matched controls.

Material and methods

Selection of the patients

The patients selected for this study were only those in which there were no question as to the accuracy of the diagnoses. Most of the patients had extensive lesions and some of them had been hospitalized many times for their psoriasis.

At least one factor influenced the formation of the series, namely that patients under sixteen years of age were only exceptionally admitted to the dermatological department. Nearly all patients came from the city of Gothenburg.

Selection of the controls

To be able to evaluate the occurrence of certain signs and symptoms of psoriasis, it was necessary to study a group of healthy persons and compare them with the psoriatics. The controls were selected so as to match the sex and age distribution of the patients with psoriasis.

Collection of the statistical data

The data of the 255 patients were collected mainly from hospital records[2] and from outpatient registers. As information accumulated in this manner could serve only to a limited extent, a supplementary investigation was made on 164 of the patients with psoriasis. They replied to questions contained in a prepared form schedule and were generally interviewed personally by the author. A few postcard questionnaires were also used.

Historical, physical and laboratory data were systematically recorded, as was also information in regard to factors preceding and associated with the onset of the psoriasis.

Special schedules were used for interview of the controls to make it possible to evaluate certain phenomena in the psoriatics especially regarding heredity, history and clinical features. All interviews were made personally by the author.

About 60 patients with psoriasis and 60 controls matched as to sex, age and time of hospitalization underwent laboratory tests at the routine laboratory of the hospital.

[1] Read before the Section on Dermatology at the Annual Meeting of the Swedish Medical Association, Stockholm, Dec 3–5 1959.

[2] Carefully prepared for statistical analysis by the head of the clinic, George Seeberg, M. D.

Department of Dermatology, (Head: Georg Seeberg, M. D.), Sahlgrenska Sjukhuset, Gothenburg, Sweden.

Table 1.

	No. of males	Percentage of males	Statistical testing
Males in Gothenburg (1958)	273,626	49.1	Significant
Males, present series	119	56.7	

Statistical analysis

The numerical comparisons made in this investigation were performed with the parametic Student's t-test and with the following nonparametic tests: Chi-Square tests, the Sign Test, the Kendall Concordance Coefficient test and the Fisher exact probability test. The level of significance was: .05.

Anamnestic and clinical data

Incidence of psoriasis

The incidence of psoriasis in relation to other skin diseases has been given in different materials and varies between 0.36 % and 8.0 % (26, 38, 35, 74, 55, 72, 33, 14).

Present series. During the period 1953–1959 there were some 55,000 new attendants admitted to the Dermatological Department of Gothenburg. The incidence of psoriasis was 3.0 per cent. for men and 3.0 per cent. for women.

Sex distribution

Data on the sex distribution of psoriasis vary in the literature, probably partly due to variations in sex distribution in the different populations from which psoriatics were drawn. The disease has been reported to be equally frequent in both sexes (3, 22, 66, 43, 59), to be more usual in women (27) or to show a predominance in men (28, 69, 71, 11, 21, 46, 49, 24, 74, 2).

Present series. Of 210 patients with psoriasis in the present series the distribution as between the sexes was 119 men (56.7 per cent.) and 91 women (43.3 per cent.).

Comparison of the sex distribution in the present series with that of the population of the city of Gothenburg, showed on Chi-Square testing, that the predominance of men among the psoriatics was significantly higher than the frequency of men in the population (49.1 per cent.). Men and women enjoyed an equal opportunity of admission to the hospital.

The mean sex distribution (59.8 per cent. men) from some randomly chosen series in the literature is in argeement with the sex distribution in the present series. No significant difference could be shown on Chi-Square testing.

Age distribution

In the literature the *median* for the age at onset (the year of recognition of the disease) of psoriasis has been estimated to be 12.5 years for men, 9.1 for women (59), 22 years for men, 167 for women (7), 12 years for men, 13 for women (43), 20.8 for men and women (44), 32 years for men, 28 for women (69). In one series the psoriasis began before 15 years of age in 44 % and in 2.7 per cent. after 50 years of age (47). In another series the onset was on the average 10 years later in men than in women (59).

Present series. The median for the age at onset was 26 years for men, 16 for women.

In figure 1 is shown the distribution of age at onset, divided into five year classes, for men and women separately.

There is a steeply rising incidence of psoriasis onset after five years of age, a maximum at the age of 10–24 years for men and 10–19 years for women.

The distribution of age at onset of psoriasis was compared with the size of population at risk in Gothenburg. In figure 2, 3 a semilogarithmic scale was used to facilitate this comparison.

The variations in the age of psoriasis onset seem to be true and not the manifestation of any special age-structure in Gothenburg's population.

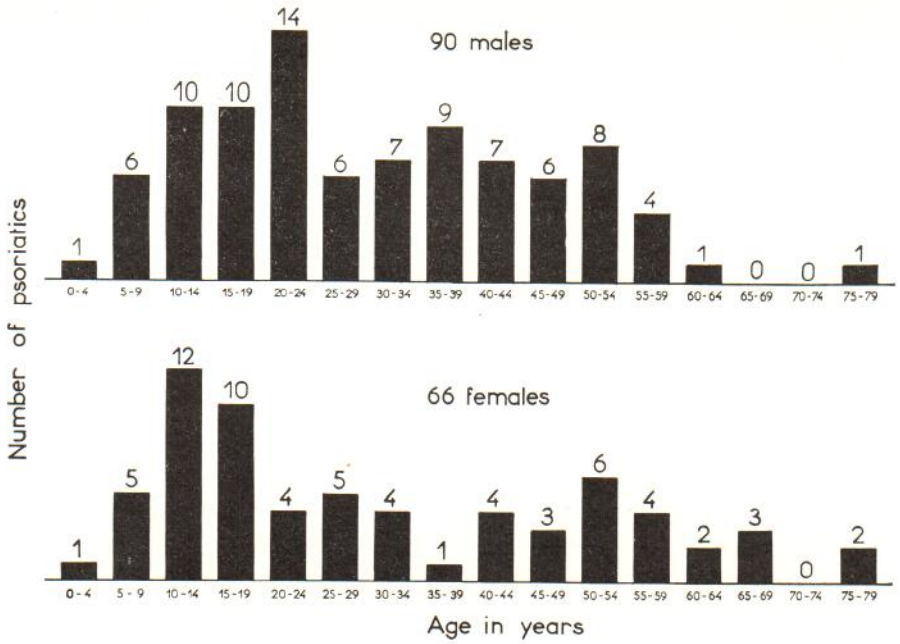

Fig. 1. Frequency distributions of the age at onset in psoriasis.

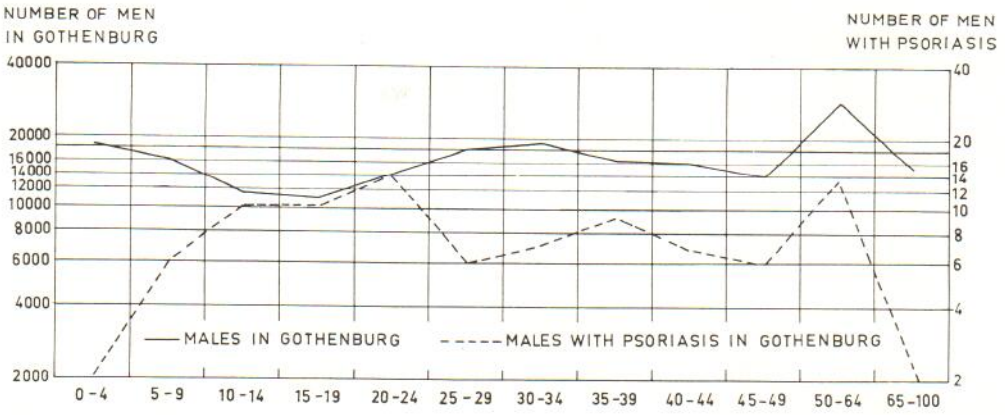

Fig. 2. Age distribution in five-year groups of males with psoriasis compared with that of the total number of males in Gothenburg.

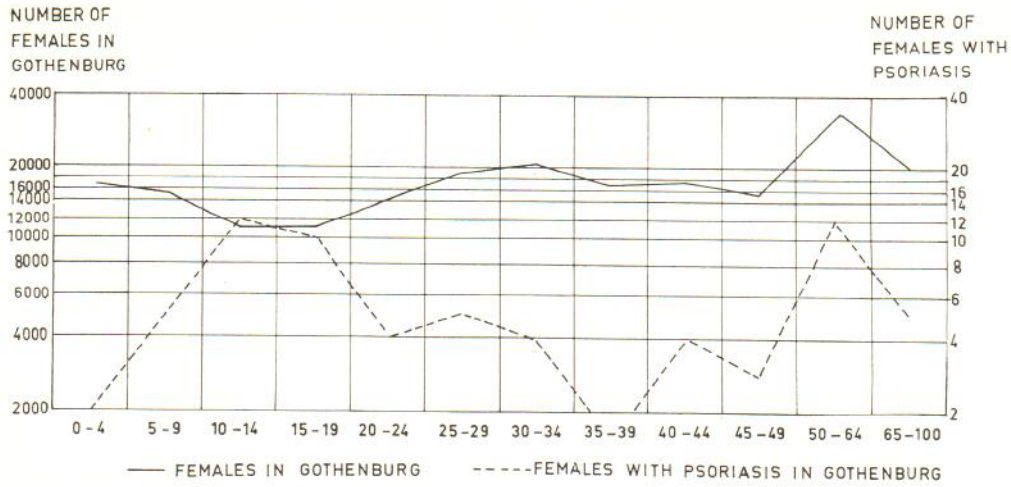

Fig. 3. Age distribution in five-year groups of females with psoriasis compared with that of the total number of females in Gothenburg 1950.

Familial occurrence of psoriasis

In the literature the figures of psoriasis frequency in the psoriatics' families varies between 1.5 and 39.0 per cent. (10, 16, 18, 23, 32, 38, 39, 45, 51, 52, 62, 66, 73). A dominant character of the hereditary disposition in psoriasis is considered to be obvious (53, 59) although external factors may play a role during the life of predisposed subjects. Monozygous twins do not always both have psoriasis (8, 15). In 312 cases 41 per cent. of the patients showed a monofactorial irregularly dominant hereditary psoriasis, mostly spreading over several generations (11). In a family where both patients had psoriasis, three of the children—triplets—contracted efflorescent psoriasis in the eighth month of life (1).

Present series. The occurrence of psoriasis among close relatives (parents, grandparents, uncles, aunts, cousins and children) was investigated in the families of the psoriatics and in the families of the same number of matched healthy controls. The data were obtained largely by questioning the patients. No attempt was made to record family size but by chance influence there is probably a similarity in the family size between psoriatics and matched controls.

The frequency of psoriasis in the families of psoriatics—36 per cent—was significantly higher than in those of the controls—4.9 per cent.

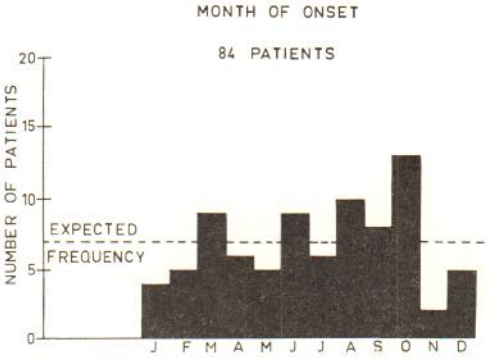

Figure 4. Distribution of onset of psoriasis according to months in a group of 84 patients.

Psoriasis in the families of the psoriatics in the present series was compared with an average 13.6 per cent. of 43 randomly chosen series of psoriasis materials from the literature. The familial occurrence was significantly higher in present series than in the average from the literature.

Seasonal variations

It has not been possible to establish any certain seasonal variations in psoriasis although there seems to be a tendency of fewer exacerbations in summer. Some authors did not find any seasonal variation, (58), others have found improvement (29) or deterioration (67, 74) in the summer.

Present series. (a) *Onset.* The distribution of the month of onset and of the exacerbations of psoriasis was calculated for 84 of the patients (fig. 4). The ex-

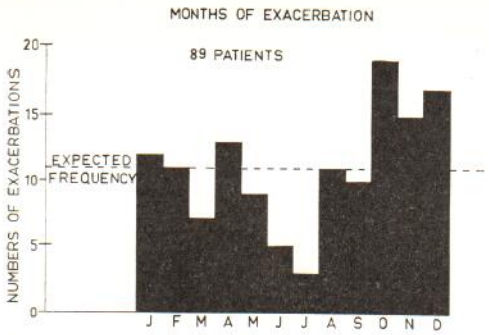

Figure 5. Number of exacerbations starting in each month in a group of 89 patients with psoriasis. The expected frequency represents the number of exacerbations that would have occurred each month, if they had been distributed equally throughout 12 months.

Table 2.

Apparent effect of season	Patients No.	Patients Per cent
None	80	48.7
Better in summer	37	22.6
Worse in summer	6	3.7
Better in winter	13	7.9
Worse in winter	29	17.7
Better in spring	16	9.8
Worse in spring	26	15.9
Better in fall	18	11.0
Worse in fall	23	14.0

pected frequency dotted in the figures represents the number of onsets and exacerbations that would have occurred each month if they had been equally distributed throughout the 12 month of the year.

The distribution of the onset of psoriasis showed a decline in frequency in January, February, November and December. In May, June, August, September and October there was a comparatively high incidence of onset. The differences were significant.

(b) *Exacerbations.* The distribution of the number of exacerbations of psoriasis was shown to be comparatively low in January, February, April, May, July, November and December, and high during March, June, August, September, and October.

From 164 patients in the present series information was obtained in regard to the *subjective effect of season* on their psoriasis (table 2).

164 psoriatics were questioned in regard to the apparent effect of *sunburn* on the course of psoriasis and the results are shown in the table 3.

Psoriasis is reported to be more prevalent in cold countries than in warmer climate. In a series of psoriatics (64) disturbances in the cutaneous cold reception, probably of central origin, were observed.

164 psoriatics in the present series were also questioned in regard to the apparent effect of *cold, moisture and heat* in the course of their psoriasis. The results are shown in table 4.

Initial localizations of skin lesions in psoriasis

Incipient psoriasis has been observed (43) in ⅔ of the patients on elbows and knees and in 8 % on the scalp.

Present series. The sites of the primary lesions were recorded in 194 patients with psoriasis, 112 men and 82 women. The order in falling incidence of the initial localizations in men and women is shown in figure 6.

In both sexes the first lesions are most common on the scalp, elbow and knee. In women initial manifestations on the hands are comparatively common. The differences between men and women are not significant as regards the sites listed.

Appearance of the psoriasis lesions

In a series 14.1 per cent of the psoriatics were of the guttate variant (32).

The appearance of the skin lesions in psoriasis varies. The tendency to involve the scalp, the knees, the elbows and the back is characteristic in ¾ of the cases (43). Some other distribution patterns of the lesions, i. e. psoriasis guttata, psoriasis nummularis and psoriasis in seborrhoico, are rather common and the frequency of these varieties in 119 psoriatics, 73 men and 46 women, in the present series is shown in table 5.

Distribution of the skin lesions and body regions

In the present series the distribution of the psoriasis lesions on different skin regions of the body was for 119 of the psoriatics (73 men and 46 women) as follows: scalp 59 men, 32 women; face 16 men, 12 women;

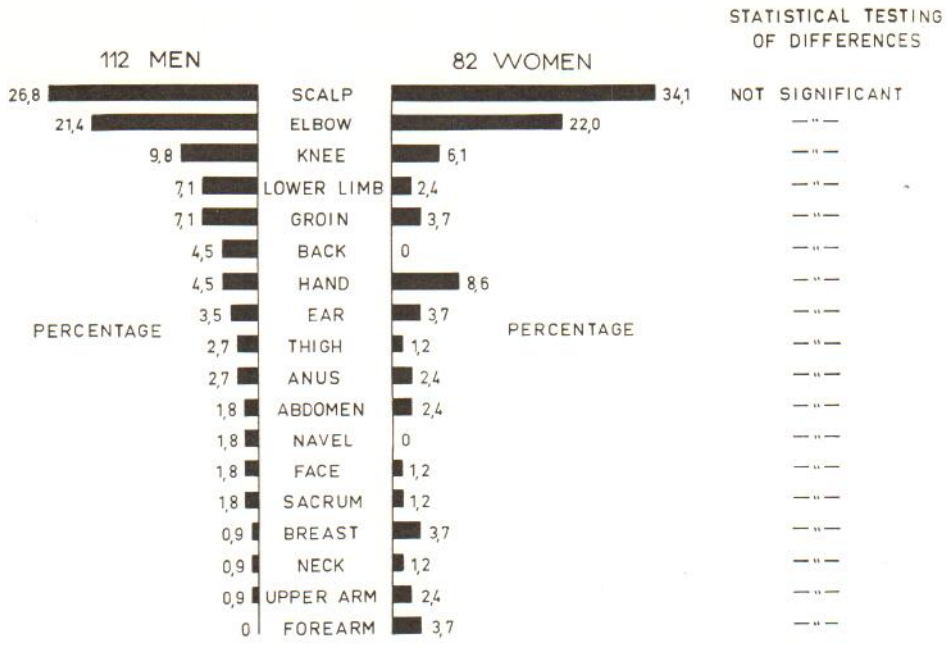

Fig. 6. Debut localization of psoriasis among 194 patients.

Table 3.

Operative factor	No. of patients	Adverse		None		Favourable	
		No.	Per cent	No.	Per cent	No.	Per cent
Sunburn	164	21	12.8	40	24.4	103	62.8

Table 4.

Operative factor	No. of patients	Adverse		None		Favourable	
		No.	Per cent	No.	Per cent	No.	Per cent
Cold	164	22	13.4	133	81.1	9	5.5
Moisture	164	33	20.1	126	76.8	5	3.1
Heat	164	24	14.6	110	67.1	30	18.3

Table 5.

Age Group	Psoriasis guttata		Psoriasis nummularis		Psoriasis in seborrhoico		Other varieties	
	M	F	M	F	M	F	M	F
10–29 years	7	7	1	2	4	2		
30–49 years		2	7	5	13	6	5	2
50–69 years			3	2	21	6	3	8
70–89 years			2	1	5		2	3
Total	7	9	13	10	43	14	10	13

Table 6. *Ranks assigned to the involvement of various cutaneous areas in 39 psoriatics*

Date of birth	Scalp	Neck	Breast	Back	Abdo-men	Arms	Elbows	Legs	Knees
81 03 14	1	7	2	3	4	5	5	5	5
86 05 02	2	3	3	4	5	1	1	6	6
88 02 17	4	5	5	3	6	1	2	7	8
93 02 17	7	5	5	4	6	3	1	8	2
94 07 18	1	4	4	4	3	2	2	5	5
95 01 12	10	7	7	6	6	4	2	1	3
96 07 30	2	3	3	4	1	5	5	6	6
99 04 25	1	10	7	5	8	4	2	6	3
02 02 09	4	7	7	1	5	6	2	3	3
02 12 18	1	7	7	6	8	3	2	4	5
05 08 11	1	3	3	4	5	6	7	8	9
06 03 21	1	4	4	2	3	8	5	7	6
06 12 07	2	3	3	1	3	2	2	3	2
07 05 21	3	4	4	4	4	2	2	5	1
08 02 27	9	6	10	2	8	3	1	5	4
10 11 27	7	6	3	2	2	4	5	1	1
15 05 01	4	6	6	3	6	1	1	2	2
15 10 06	1	10	7	6	8	2	3	5	4
16 06 01	4	6	4	2	5	1	7	3	7
19 07 16	1	3	3	2	4	5	6	7	8
20 05 01	1	3	3	8	3	7	2	5	6
20 10 31	5	4	4	4	4	3	2	1	3
21 07 14	2	6	6	6	7	5	3	4	1
23 08 09	8	9	5	6	7	4	1	3	2
23 12 03	1	9	8	7	2	5	6	4	3
26 06 15	1	6	6	5	2	3	3	4	4
26 09 20	5	9	6	7	8	1	3	4	2
27 07 31	2	10	4	5	3	7	1	8	9
28 09 03	1	10	10	9	9	7	3	5	2
29 07 24	4	6	6	5	8	1	1	3	2
33 08 27	7	9	8	4	6	5	3	1	2
37 06 11	1	3	5	5	5	3	2	3	3
38 06 21	1	2	2	1	2	2	2	3	3
43 11 01	1	9	8	7	6	5	4	3	2
43 12 04	3	9	8	6	7	5	4	2	1
45 10 13	3	5	5	5	5	4	4	1	2
46 03 14	2	4	1	3	2	6	5	4	7
48 09 24	8	1	6	6	3	7	7	5	5
49 02 16	3	9	2	8	1	4	5	6	7
	125	232	200	175	190	152	124	166	156

The Kendall coefficient of Concordance $W = 0{,}108$ Chi-square $(x^2) = 33{,}7$ $DF = 8$
W is significant at the 0,1 % level.

shoulder 20 men, 9 women; regio axillaris 19 men, 14 women; chest 37 men, 23 women; sub-mammary 21 women; upper arm 30 men, 17 women; elbows 47 men, 27 women; fore-arm 32 men, 19 women; hands 23 men, 10 women; nails 29 men, 13 women; lumbal 21 men, 11 women; sacral 32 men, 18 women; buttocks 26 men, 21 women; back 26 men, 15 women; abdomen 43 men, 21 women; groin 25 men, 15 women; genitalia 24 men, 10 women; regio pudenalis 20 men, 8 women; thigh 37 men, 22 women; knees 40 men, 25 women; lower leg 40 men, 19 women.

The patients in the present series thus had extensive psoriasis lesions.

Order of involvement of different regions. Present series. 39 patients, all with extensive lesions had observed their "pathways of spread" so carefully that their information was used as a basis for analysis. The significant most common "pathway of spread" in generalized psoriasis was in the following order: elbows, scalp, arms, knees, legs, back, abdomen, breast and neck (table 6).

The site of onset of skin lesions, usually the primary plaque, was ranked as 1, the following as 2, and the region last involved ranked as 9. This gave a rank number between 1 and 9 for each of the nine sites in each patient. When the psoriasis changes appeared simultaneously in two different sites, these were given the same number and consideration was given to this ranking in the statistical tests. Obviously a low rank sum implied a large amount of low rank numbers for this site, meaning that the skin changes have reached the relevant region early. Conversely, a high sum of the ranks inferred a larger amount of high rank number and a comparatively late spread to that site. In order to ascertain whether any statistically proved connexion existed between the different sums of the ranks, Kendall's Concordance Coefficient test was used (40). This showed the difference between the sums of the ranks to be significant.

Possible precipitating or exacerbating factors in psoriasis

Koebner's phenomenon. Initial psoriasis lesions often occur in areas of the skin irritated by mechanical, physical or chemical agents (56). A difference in the reaction of the capillaries to trauma in the psoriatic and non-psoriatic individuals seems to be one of the mechanisms in the Koebner's phenomenon (70). In a series of 25 cases of guttate psoriasis, 23 began in the scars of smallpox vaccinations, one after a BCG vaccination, one after an influenza vaccination, all examples of Koebner phenomena in previously healthy individuals (54).

Present series. Among 164 psoriatics in the present series, 77 reported skin lesions at the sites where psoriasis developed. In 80 psoriatics deterioration of psoriasis was reported after a skin injury. The causes of the Koebner's phenomenon are shown in table 7.

Table 7. *The appearance of lesions of psoriasis at the site of a skin injury (Koebner's phenomenon)*

Apparent effect of	Début of psoriasis	Deterioration of psoriasis
Burns	2	3
Clothing	0	2
Colour	1	3
Dermatitis herpetiformis	0	1
Measles	2	2
Mortar	1	4
Operation scar	2	7
Pressure (belt, hat)	2	8
Scar after wound	9	18
Solution material	2	6
Urticaria	2	1
Vaccination	3	0
Varicella	2	0
Washing material	3	19
Wearing	0	6
X-ray treatment	2	0

Among 164 psoriatics 77 showed Koebner's phenomenon.

Effect of upper respiratory throat infections on psoriasis

Psoriasis often commences following upper respiratory infections (19, 20, 48).

In the present series 163 patients were asked if they suffered from common cold, acute tonsilitis, influenza or pneumonia at the time of onset of their psoriasis.

The patients were also questioned in regard to the apparent effect of intercurrent infection on their psoriasis.

Cutaneous infections

Five psoriatics among 163, 3.1 per cent., in present series reported the onset on their psoriasis to be closely preceded by furuncles or carbuncles and 3 psoriatics, 1.8 %, were adversely affected by such infections.

Epidemic diseases

Psoriasis has been described to disappear after measles infections (13, 42).

Table 8. *Apparent effect of intercurrent infections on symptoms of 163 patients with psoriasis. Frequency of acute onset of psoriasis with infection as a precipitating issue*

Apparaent effect of	Adverse		None		Favourable		Onset of psoriasis	
	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Common cold	37	22.7	73	44.8	1	0.6	7	4.3
Acute tonsillitis	32	19.6	50	30.7	2	1.2	9	5.5
Influenza	36	22.1	65	39.9			3	1.8
Pneumonia							1	0.6

Table 9. *Apparent effect of menarche, menstrual periods, pregnancy, childbirth, menopause and œstrogenic hormones on symptoms of psoriasis among females in the present series*

Apparent effect	Favourable	None	Adverse	Onset of psoriasis
Menarche				10
Menstrual periods	0	22	18	
Pregnancy	9	8	1	0
After childbirth	2	6	10	6
Menopause	1	12	6	7
Oestrogenic hormone therapy		3		

In two cases among 163, (1.2 per cent), in the present series measles was reported having closely preceded the onset of psoriasis and two cases, 1.2 per cent., varicella was considered to have precipitated the disease. Two psoriatics, 1.2 per cent., were adversely affected by measles.

Endocrine factors

There is little evidence that psoriasis is due to ovarian or pituitary dysfunction although benefits have been reported in the past from medication with oestradiol, progesterone (6) and cortical hormone. Implantation of placental tissues had been described to be successful in the treatment of psoriasis (50). Psoriasis often disappears during pregnancy (30).

The increase of onset of psoriasis in women between the ages of 50 and 55 years suggests an influence of the menopause, and the increased frequency of onset of psoriasis between the ages of 10 and 15 years in women may suggest an influence of the menarche.

Present series. 56 women in the present series were questioned about the apparent effect on their psoriasis of menarche, menstrual periods, pregnancy, childbirth, menopause and oestrogenic hormones.

7 among 26 women reported that the onset of their psoriasis took place in close association (within 6 months) to the time of their menopause.

10 women among 56 reported that the onset of their psoriasis took place in association to the time of their first menstruation.

While pregnancy in the present series had mostly an ameliorating effect on psoriasis with no reported case of onset of the disease, no less than 6 women among 24 developed their psoriasis following childbirth. None among three treated with oestrogenic hormone developed their disease in association with the therapy (table 9).

Psychogenic factors

Psoriasis has been attributed to fright, shock and neurotic conditions. Many patients with psoriasis are said to have a peculiar mental background. The psoriasis eruptions seem

Table 10.

Apparent effects	Adverse		None	
	No.	Per cent	No.	Per cent
Psychogenic factors	87	53.1	77	46.9

to be related to psychogenic factors (31) and a significant psychoaffective influence has been observed (68, 12, 5). In two series (4) about half of the psoriatics suffered from psychoasthenia. Chlorpromazine treatment in psoriatics is said to reduce the lesions which has been thought to prove the importance of the stress factor in the genesis of psoriasis (57).

Present series. 163 psoriatics in the present series were asked about the apparent effect of nervousness on the course of their psoriasis. The results are shown in table 10.

Fever

Present series. To the question if fever had any influence on the psoriasis 32 of 163 psoriatics (19.6 per cent.) replied that they had observed exacerbations of their psoriasis within 24 hours of the beginning of the fever. Seven psoriatics (4.3 per cent.) reported favourable effect of fever on their skin disease and 79 (48.5 per cent.) no effect.

Incidence of other diseases in psoriatics

Psoriasis lesions sometimes commence as a Koebner's phenomenon in skin irritated by other skin or epidemic diseases, for example measles, urticaria, herpes zoster (13, 17, 25, 42). There seems to be an association between rheumatoid arthritis and psoriasis (30).

Asthma, allergic rhinitis, atopic dermatitis and urticaria have been shown to occur in the families of 50 per cent. of all psoriatics (25), but the frequency of these diseases among the psoriatics have not been investigated earlier. Diabetes mellitus is not more prevalent in psoriatics than in controls (15).

Present series. The psoriatics in the present series were investigated as to the occurrence of different earlier diseases to determine whether certain diseases or groups

Table 11. *Frequency of certain illnesses among 164 psoriatics and 164 controls matched according to sex and age*

Type of illness	Distribution of illness			
	Patients	Controls	Diff	Test
Anemia	24	22	2	
Appendicitis	32	24	8	
Asthma	7	2	5	
Bronchitis	39	24	15	Significant
Cholecystitis	12	6	6	
Cystitis	28	18	10	
Diabetes mellitus	7	0	7	
Diphteria	10	7	3	
Erysipelas	3	3	0	
Goiter	4	1	3	
Hay fever	5	9	4	
Heart disease	15	6	9	
Herpes simplex	35	41	6	
Herpes zoster	6	9	3	
Influenza	88	50	38	Significant
Jaundice	12	6	6	
Lumbago-ischias	53	22	31	Significant
Malignant tumor	10	4	6	
Measles	100	99	1	
Meningitis	2	3	1	
Menstrual disorders	11	7	4	
Mental disease	20	8	12	Significant
Miscellaneous infections	32	16	16	Significant
Mumps	72	64	8	
Nephritis	9	5	4	
Ovarian disease	5	1	4	
Otitis	27	22	5	
Peptic ulcer	11	11	0	
Pertussis	62	63	1	
Poliomyelitis	2	1	1	
Pyelitis	7	4	3	
Renal calculus	10	3	7	
Rheumatoid arthritis	39	9	30	Significant
Rheumatic fever	7	3	4	
Rubella	38	46	8	
Scarlet fever	17	16	1	
Sinusitis	12	11	1	
Tonsillitis	61	63	2	
Tonsillectomia	19	19	0	
Tuberculosis (pulmonary)	5	5	0	
Urticaria	22	11	11	Significant
Varicella	50	58	8	

Table 12.

Apparent effects	Adverse		None		Favourable	
	No.	Per cent	No.	Per cent	No.	Per cent
Crustaceans	4	2.4	160	97.6		
Fruit and vegetables	16	9.8	145	88.4	3	1.8
Spices	25	15.2	139	84.8		
Alcoholic beverages	30	18.3	134	81.7		

of diseases were especially common among patients contracting psoriasis. The frequency of 45 different illnesses recorded in the lifetime of each patient was investigated among 164 psoriatics and the controls were carefully questioned by the same examiner. The incidence of diseases in these two groups is given in table 11.

The two groups correspond rather closely as regards the incidence of diseases, but statistically significant higher frequencies among the psoriatics were demonstrable between the groups with respect to 7 diseases and disease categories: urticaria, rheumatoid arthritis, the low-back pain syndrome, miscellaneous cutaneous infections, influenza, bronchitis and mental disease.

Diet

There is no specific diet for the treatment of psoriasis and no dietary regime has yet been shown to have any specific favourable effect on the course of the disease. During the war years when special nutritional conditions prevailed, neither an increase nor a decrease in the number of cases of psoriasis was noted (66).

Of 13 patients with psoriasis imprisoned in Japanese starvation camps, eight improved; however, five grew worse again after liberation (65).

Present series. The psoriatics in the present series were questioned whether there was some food they could not tolerate because it irritated their skin lesions or if there was any dietary regime that produced a beneficial effect on the disease process. The results are shown in table 12.

Laboratory tests

I. Blood tests

Laboratory blood tests were carried out in some 60 patients with psoriasis and an equal number of healthy controls matched as to age, sex and time of examination. Psoriatics with arthritis psoriatica were not included in these series.

Red and white blood picture

Haemoglobin

No significant difference was demonstrable between the mean values in psoriatics and controls.

Ljungberg's method of haemoglobin determination was used. The arithmetic mean in 63 psoriatics was 89.4, variance 92.9, and the mean in 63 controls was 92.0, variance 94.0. Difference –2.6. Homogenous variances on F-testing. Student's t-test: not significant. The Sign-test: not significant. (23+, 36–, 4 zeros).[1]

Red blood count

No significant difference was demonstrable between the mean values in the psoriatics and controls.

The Ellerman method was used. The arithmetic mean in 60 psoriatics was 4.54, variance 0.40, and the mean in 60 controls was 4.55, variance 0.39. Difference –0.01. Homogenous variances on F-testing. Student's t-test: not significant. The Sign-test: not significant (29+, 28–, 3 zeros).[1]

[1] + sign means higher values in the psoriatics than in control patients and ÷ sign means lower values. Zero means no difference.

Erythrocyte sedimentation rate

No significant difference was demonstrable between the mean values in the psoriatics and controls.

Westergren's method of determination was used. The arithmetic mean in 64 psoriatics was 14.0, variance 174.6 and in 64 controls 12.3, variance 137.3. Difference 1.7. Homogenous variances on F-testing. Student's t-test: not significant. The Sign-test: not significant (33+, 23–, 3 zeros).

White blood count

No significant difference emerged between the means of the white blood cells totals in the psoriatics and controls.

Ellerman's method was used. The arithmetic mean in 62 psoriatics was 7022.6, variance 3,111,892, and in 62 controls 6908.1, variance 5,028,045. Difference 114.6. Student's t-test: not significant. The Sign-test: not significant (34+, 28–).

Neutrophil leucocytes (juvenile and adults)

No significant difference emerged between the mean values in psoriatics and controls.

Differential counting of white cells was performed after staining with Grünwald's solutions. The arithmetic mean in 62 psoriatics was 36,120, variance 1,462,119. and in 62 controls 3717.8, variance 2,862,119. Difference –105.8. Student's t-test: not significant. The Sign-test: not significant (32+, 30–).

Eosinophil leucocytes

No significant difference emerged between the means of the eosinophilic leucocytes in psoriatics and controls.

The arithmetic mean in 62 psoriatics was 299.4, variance 50,542, and in 62 controls 246.7, variance 53,883. Difference 52.7. Homogenous variances. Student's t-test: not significant. The Sign-test: not significant (38+, 24–).

Monocytes

No significant difference emerged between the mean values in psoriatics and the controls.

The arithmetic mean value for monocytes in the psoriatics was 318.1, variance 39,029, and for the controls 306.3, variance 49,224. Difference 11.8. Variances homogenous. Student's t-test: The Sign-test: not significant (30+, 30–).

Lymphocytes

No significant difference emerged between the mean values in psoriatics and controls.

The arithmetic mean in 62 psoriatics was 2757.1, variance 1,069,994 and in 62 controls 2611.1, variance 1,201,951. Difference 145.0. Student's t-test: not significant. The Sign-test: not significant (38+, 24–).

Serum protein

There are many reports in the literature about total serum protein and serum protein fractions. Some authors have found no serum protein abnormalities (60), others report the beta lipid fractions, total lipoprotein fractions and the gammaglobulin (36, 37, 63) to be elevated in psoriatics. In one series (12) the gamma- and alpha globulin fractions were elevated, in another (41) the alpha 2-, beta- and gamma globulin fractions were high in the psoriatics.

Present series

Total serum protein

The mean value for total serum protein did not differ between the psoriatics and the controls.

Van Slyke's copper sulphate method of determination was used. The arithmetic mean in 29 psoriatics was 6.84, variance 0.27 and in 29 controls 6.73, variance 0.11. Difference 0.11. Student's t-test: not significant. The Sign-test: not significant (16+, 10–, 3 zeros).

Serum protein fractions

The determinations were made with the paper electrophoresis method.

Albumin

The mean value for albumin in the Psoriatics was significantly lower than in the controls.

The arithmetic mean in 29 psoriatics was 3.34, variance 0.27 and in 29 controls 3.80, variance 0.03. Difference –0.46. Variances not homogenous. The Sign-test: significant (25–, 3+, 1 zero).

Alpha$_1$ globulin

The mean value for alpha$_1$ globulin in the psoriatics did not significantly differ from that of the controls.

The mean value in 29 psoriatics was 0.40, variance 0.01, and in 29 controls 0.36, variance 0.007. Homogenous variances. Difference 0.04. Student's t-test: not significant. The Sign-test: not significant (14+, 9–, 6 zeros).

Alpha$_2$ globulin

The mean value for alpha$_2$ globulin in the psoriatics was significantly higher than in the controls.

The arithmetic mean for 29 psoriatics was 0.66, variance 0.015 and in 29 controls 0.50, variance 0.001. Variances not homogenous. The Sign-test: significant (22+, 3–, 4 zeros).

Beta globulin

The mean value for beta globulin in the psoriatics was significantly higher than in the controls.

The arithmetic mean in the psoriatics was 0.98, variance 0.036 and for the controls 0.78, variance 0.005. Difference 0.20. Variances not homogenous. The Sign-test: significant (21+, 4–, 4 zeros).

Gamma globulin

No significant difference emerged between the mean values for gamma globulin in psoriatics and controls.

The arithmetic mean for 29 psoriatics was 1.46, variance 0.14 and for 29 controls 1.28, variance 0.008. Difference 0.18. Variances not homogenous. The Sign-test: not significant (18+, 9–, 2 zeros).

Antistreptolysin titre

In present series the antistreptolysin titre (ASL) was determined in 145 psoriatics and in 19 apparently healthy controls. The determinations were usually made during the first week after hospitalization. Normal values for the ASL-titre are stated to be 250 and below.

Of the 69 psoriatics with elevated ASL-titres, 36 had values of 800 and above (Table 13). This agrees with reports in the literature (32, 48).

Table 13.

ASL Titres	Psoriatics	Controls	Statistical testing
Normal	76	18	
≥ 400	69	1	Significant
Total	145	19	

Table 14.

No. of psoriatics	Growth of		
	Hemolytic streptococci	Hemophilus influenzae	Other micro-organisms
50	13	8	29

Table 15.

ASL Titres	Growth of hemolytic streptococci	No growth of hemolytic streptococci
200	4	6
400	7	5
Total	11	11

ASL and growth of hemolytic streptococci

Culture examination

In 26 per cent. of the psoriatics in the present series the hemolytic streptococci were isolated. (Table 14). In a standard population only 5–10 per cent. are nasopharyngeal carriers of hemolytic streptococci (9).

A report in literature states that in about 2/3 of cases of guttate psoriasis, hemolytic streptococci have been detected in throat cultures (32).

Among 50 psoriatics in the present series a culture examination of material obtained from the nasopharynx was made.

13 psoriatics with hemolytic streptococci in their nasopharynx and an equal number of randomly chosen psoriatics without those micro-organisms in their nasopharynx were compared as to the level of the ASL-titre.

The difference was not significant and thus no correlation between actual growth of hemolytic streptococci and high ASL-titre in psoriasis could be demonstrated in this series. (Table 15).

Antistaphylosin titre

In present series the antistaphylosin titres (ASTA) was determined in 147 psoriatics. Normal values for the titre are stated to be 2 and below. Seven of the psoriatics had elevated values.

II. Radiological examinations

Chest

In 74 psoriatics, 26 men and 48 women, a routine physical and radiological examination of the chest was made. More or less extensive bronchopneumonic lesions were noted in 7 patients, 4 men and 3 women, and pulmonary emphysema in 2 psoriatics (one man and one woman).

Accessory nasal sinuses

Routine radiological examinations were performed in 59 patients in the search for foci of infection. In 8 patients there was very suspect infection in the maxillary sinus and in 1 patient in the frontal sinus. X-ray alone cannot differentiate between an active and a clinically cured sinus infection.

Teeth

In search for foci of infection the teeth were X-rayed in 16 psoriatics.

Root abscesses of the molar teeth were observed in 2 cases.

III. Other examinations

Body weight

No significant difference emerged between the mean values of body weight in the psoriatics and the healthy controls.

The arithmetic mean in 64 psoriatics was 69.8, variance 224.9 and the mean in 64 controls 68.9, variance 169.0. Difference 0.9. Homogenous variances. Student's t-test: not significant, the Sign-test: not significant (32+, 32–).

Reports in the literature state that psoriatics are no more prone to overweight than patients with other dermatoses (15).

Blood Pressure

No significant difference emerged between the mean values for systolic blood-pressure in psoriatics and controls.

The arithmetic mean in 61 psoriatics was 152.2, variance 1184, and the mean in 61 controls 147.3, variance 744. Difference 4.9. Student's t-test: not significant. The Sign-test: not significant (32+, 27–, 2 zeros).

SUMMARY

A total of 255 patients with extensive psoriasis treated at the Department of Dermatology in Gothenburg during the period 1953–1959 were studied and compared with apparently healthy controls matched as to age, sex and number.

1. *The incidence* of psoriasis was for men 3.0 per cent. and for women 3.0 per cent. of the total number of patients with skin diseases admitted to the Department of Dermatology in Gothenburg.

2. The *sex distribution* showed a predominance of men (56.7 per cent.), significantly higher than the proportion of men (49.1 per cent.) in Gothenburg and in agreement with the mean sex distribution from randomly chosen series in the literature (59.8 per cent.).

3. The *age distribution* for the onset of psoriasis showed a maximum for men between 10–24 and women 10–19 years of age—variations that were true for psoriasis and not manifestations of any special age-structure in Gothenburg's population.

4. The *familial* occurrence of psoriasis among close relatives was for the psoriatics 36 per cent. and for the matched healthy controls 4.9 per cent.

5. *Seasonal variations.* An elevated frequency of onsets and exacerbations of psoriasis was observed in June, August, September and October. In 48.7 per cent. of the psoriatics season had no subjective effect. 22.6 per cent. were better in summer, 7.9 per cent. in winter, 9.8 per cent. in spring and 11.0 per cent. in fall. 3.7 per cent. were worse in summer, 17.7 per cent. in winter, 15.9 per cent. in spring and 14.0 per cent. in fall.

6. The *most common localization* of psoriasis was on the scalp. The most common

"pathway of spread" in generalized outbreaks was in following order: elbows, scalps, arms, knees, legs, back, abdomen, breast and neck.

7. *Koebner's phenomenon.* 47.0 per cent. of the psoriatics (77/164) reported skin lesions at the sites where psoriasis developed and these skin lesions were of different types.

8. *Infections* (tonsillitis, common cold, influenza, pneumoni) occurred before onset of psoriasis in 12.2 per cent. (20/164). 20 per cent. of the psoriatics were adversely and 1 per cent. favourably affected by infections. Cutaneous infections preceded onset of psoriasis in 3.1 per cent. and measles in 1.2 per cent.

9. *Onsets* of psoriasis and menarche seemed to be associated in 17.9 per cent. (10/56), childbirth in 25 per cent. (6/24), menopause in 26.9 per cent. (7/26). 50 per cent. (9/18) of the psoriatics improved during pregnancy. 45 per cent. (18/40), was adversely effected by menstrual periods.

10. *Nervous stress* caused exacerbations in 53.1 per cent. (87/164) of the psoriatics.

11. *Earlier diseases* having occurred in a statistically proven higher incidence in psoriatics than in matched controls were: urticaria, rheumatoid arthritis, low back pain, miscellaneous cutaneous infections, influenza, bronchitis and mental diseases.

12. *Diet,* that had an adverse effect on psoriatics, was crustaceans (2.4 per cent.), fruit and vegetables (9.8 per cent.), spices (15.2 per cent.) and alcoholic beverages (18.3 per cent.).

13. *Laboratory tests*

a) *Laboratory blood* tests were performed in approximately 60 psoriatics and an equal number of controls matched as to age and sex. These included determination of the *haemoglobin level, red and white blood counts, neutrophil, eosinophil leucocytes, monocytes and lymphocytes, erythrocytes sedimentation rate, total serum protein, albumen, alpha-1 and alpha-2 globulins, beta- and gamma globulins.* Comparative of the two groups showed the following to be statistically significant in the psoriatics:

(1) depression of albumin in serum

(2) elevation of alpha$_2$ globulin and beta globulin in serum.

b) *Bacteriological tests*

The *antistaphylosin titre* was elevated in 4.8 per cent. (7/47) of the psoriatics and the *antistreptolysin titre* in 47.6 per cent. (69/145) of the psoriatics—significantly higher than for the controls (5.3 per cent.).

Culture examinations of material from nasopharynx showed growth of beta-hemolytic streptococci in 26 per cent. of the psoriatics (in normal population: 5–10 per cent.). There seemed to be no association between actual growth of beta-hemolytic streptococci and elevated antistreptolysin titre in the psoriatics.

c) *Radiological examinations* showed bronchopneumonic lesions in 9.5 per cent. (7/74), pulmonary emphysema in 2.7 per cent. (2/74), of suspect infection in accessory nasal sinus in 15.3 per cent. (9/59).

d) *Body weight* and *blood pressure* did not significantly differ between psoriatics and controls.

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