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# PITYRIASIS ROSEA

A STATISTICAL, CLINICAL, AND LABORATORY INVESTIGATION  
OF 826 PATIENTS AND MATCHED HEALTHY CONTROLS

*by*

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“2° une autre variété que l'on pourrait désigner sous le nom de pityriasis rosé, et qui offre les caractères suivants: de petites taches furfuracées très légèrement colorées, irrégulières, d'une étendue qui ne dépasse guère celle de l'ongle, nombreuses et rapprochées, quoique séparées toujours par quelque intervalle de peau saine, prurigineuses, qui se répandent sur les parties supérieures du corps, de préférence sur le cou, le haut de la poitrine, le haut des bras, mais peuvent successivement se propager de haut en bas, jusque sur les cuisses, en sorte que la durée totale de l'éruption, qui s'efface peu dans les parties qu'elle avait occupées en premier lieu, à mesure qu'elle descend plus bas, se prolonge assez ordinairement pendant six semaines ou deux mois. Cette éruption, plus commune chez la femme que chez l'homme, s'observe assez fréquemment durant la saison chaude de l'année. Elle ne se montre guère que dans la jeunesse et sur les individus dont la peau est blanche, fine et délicate.”

(C. M. Gibert 1860)



The literature since the 18th century records descriptions of disorders which would appear to be identical with the condition now known by the name pityriasis rosea. The disease has been given different names, such as erythema annulatum (Rayer), herpes tonsurans maculosus et squamosus (Hebra), lichen annulatus serpiginosus (Wilson), pityriasis circiné (Horand), pityriasis disseminé (Hardy), pityriasis marginée et circinée (Vidal), pityriasis rubra aigu disseminé (Bazin), pseudoexanthème erythémato-desquamatif (Besnier), roseola annulata (Willan), roseola furfuracea herpetiformis (Behrend), roseola squamosa (Nicolas & Chopard). But it was Gibert who introduced the name by which the disease has been known for exactly a hundred years.

The *aetiology* of pityriasis rosea is unknown. Owing to its clinical resemblance to dermatomycosis, the disease has been assumed to be caused by a fungus; it is said that both spores (34, 84, 151) and mycelium (85) have been demonstrated in scales from pityriasis rosea lesions. *Microsporon dispar* (203), *Oidium*-like organisms (140), and Benedek's so-called constant endoparasite (13, 15) have been reported as causes. Similarity with the course of the infectious exanthematous diseases has prompted the assumption that pityriasis rosea is of infectious nature (31, 52, 155, 184, 207) and that its cause should be sought among the filterable viruses (116, 173, 185). The possible rôle of *Staphylococcus albus* (67) and hemolytic streptococci (see below) has been the subject of discussion. It has also been suggested that gastrointestinal (39, 48, 182) or psychogenic factors (2, 79) as well as different garments might precipitate the disease. The latter factor is discussed on page 28—29.

Our imperfect understanding of the aetiology of the disease is reflected in the numerous *methods of treatment* practised: Bismuth (66, 78), salvarsan (78), arsenic (120), trichophyton extract, oidiomycin, staphylococcal toxoid, lactalbumin (196), streptococcal vaccine (8, 61), coli vaccine (23), typhoid vaccine (41, 161), so-called Benedek vaccine (177), cortisone (120, 219), salicylates (1), pyrifer (154), milk injections (107), Gram's solution (239), calcibromate (144), esophylaxin (91), calciferol (70), potassium iodide (142), antihistaminics (34), penicillin (66, 120, 156), sulphonamides (193), convalescent plasma and gamma globulin (163), ultra-violet rays (36, 72, 73, 124, 166) and roentgen (90). For local application on the skin, aside from various indifferent agents, the following have been used: eosin (59), salicylic alcohol (220), mercury bichloride (179), sulphur (176, 197), tar (22), and potassium permanganate (133, 165).

Since modern statistics might afford additional information, we believed a statistical analysis of a major clinical series of pityriasis rosea to be warranted. The analysis encompassed incidence, age, sex, occupation, seasonal variations, epidemic outbreaks, recurrences, precipitating factors, and clinical features, as well as the incidence of earlier or coexistent diseases and a heredity for certain allergic disorders.

No more systematic laboratory investigations of pityriasis rosea appear to have been published, although occasional case reports have included data such as the presence of pathologic changes in the white blood picture. In the present series, examination also embraced the numbers of red and white blood cells, white blood picture, number of thrombocytes, erythrocyte sedimentation rate, serum protein, bleeding time, clotting time, prothrombin index, icterus index, and blood pressure.

### Material

During the period 1949 to 1959, 826 patients with pityriasis rosea were treated at the Department of Dermatology in Gothenburg (Table 1). Cases in which the diagnosis left room for doubt were excluded from the series. Only 42 of the patients were hospitalized for clinical treatment during the period. The indication for clinical treatment was most usually a sharp exacerbation of the condition, although some patients were admitted for another disease such as heart disorders, diabetes mellitus, or urticaria. In some few instances, hospitalization was prompted chiefly by social reasons.

Table 1. Present Series of Pityriasis Rosea and Controls.

	Patients with pityriasis rosea	"Healthy" controls	Controls with other skin diseases
Total number of cases	826		
Comparative studies	108	108	
Laboratory tests	54	54	
Women of fertile age investigated with respect to pregnancy	40		40

The data on these 826 patients were collected mainly from hospital records and out-patient registers. As all information accumulated in this manner, this was composed of heterogeneous elements. It can serve only to a limited extent, and our conclusions were therefore based only on such data in the available hospital records and out-patient registers as could be rated as reliable: incidence, age, sex, occupation, and season.

In order to study heredity, history, and clinical features, a supplementary investigation was made of 108 patients with recent pityriasis rosea treated during 1958 and 1959. These patients were interviewed by us personally and questioned along uniform lines, chiefly as regards their history. An attempt at objective evaluation of the occurrence of certain phenomena in these 108 patients required study of a group of healthy persons with whom the patients in the series could be compared. Therefore, the 108 controls were selected so as to match the sex and age distribution of the patients with pityriasis rosea. The controls were drawn mainly at random from among secretaries, social workers, nurses, maids, porters, kitchen staff, and other hospital employees, but also from other categories.

Fifty-four patients with pityriasis rosea of recent date underwent laboratory tests, as did a control group of 54 apparently healthy persons of matched age and sex. The

incidence of pregnancy in pityriasis rosea patients of fertile age was compared with that in a control series of women with other skin diseases and of the same age. All the patients came from the same district, the city of Gothenburg.

## INCIDENCE OF PITYRIASIS ROSEA

The disease has often been maintained to be rare. Its incidence in relation to other skin disease has been given at different hospitals as between 0.3 per cent and 3.0 per cent (1, 22, 36, 37, 39, 47, 57, 98, 99, 109, 112, 115, 118, 120, 147, 153, 155, 186) (Table 2).

Table 2. Incidence of Pityriasis Rosea among Patients with Skin Diseases in Series from the Literature.

Author	Total number of patients with skin diseases	Number of patients with pityriasis rosea	Per cent with pityriasis rosea
Towle, 1904	280	1	0.3
Mac Leod, 1914			0.3
Bolan, 1914			0.3
Felke, 1926	182 162	647	0.36
Percival, 1932	60 563	234	0.39
Crocker, 1903	250	1	0.40
Little, 1914	5 864	28	0.48
Kogoj and Farkas, 1932	6974	46	0.68
Lynch, 1931	21075	146	0.69
Kolb, 1933			0.7
Glaubersohn, 1931			0.76
Marcozzi, 1934	10 700	82	0.77
Pollitzer, 1918			1.0
Crissey, 1956			1.0
Dore, 1914	2000	21	1.0
Adamson, 1914			1.0
Marshall, 1956			1.8
Pick, 1928			2.0—3.0

### *Present Series*

In the present series there were among 62,046 patients with skin diseases, 813 cases of pityriasis rosea (the adjustment of the figures was done in view of incomplete data on the total number of patients); that is, 1.31 per cent. The disease is, then, fairly common in Gothenburg.

It might be of interest to discover whether the incidence of the disease has changed during the course of the years; that is, whether any predominance of upward or downward changes in the frequency curve emerges (Table 3). If neither direction of movement predominates, the two signs (plus and minus) in Table 3 should be equally numerous except for chance variations. There are 60 plus signs and 59 minus signs, "no change" being counted as  $\frac{1}{2}$  plus and  $\frac{1}{2}$  minus. Statistical testing failed to provide any clear evidence of trend, since the discrepancy is less than one standard deviation. The upward movements might, of course, be on the average larger or smaller than the downward movements. A trend of that kind would not be detected by this test.

Table 3. Frequency of Pityriasis Rosea in Present Series.

Year	Month	Frequency of pityriasis rosea	Two categories*	Change	Year	Month	Frequency of pityriasis rosea	Two categories*	Change
1949	1	6	H*		1952	10	8	H	+
	2	5	L*	—		11	6	H	—
	3	6	H	+		12	10	H*	+
	4	7	H	+	1953	1	4	L*	—
	5	9	H*	+		2	6	H	+
	6	4	L	—		3	9	H	+
	7	2	L	—		4	8	H	—
	8	4	L*	+		5	11	H	+
	9	7	H*	+		6	9	H*	—
	10	3	L	—		7	2	L	—
	11	2	L*	—		8	5	L	+
	12	6	H	+		9	2	L*	—
1950	1	9	H	+		10	11	H	+
	2	7	H*	—		11	16	H	+
	3	5	L	—		12	8	H*	—
	4	4	L	—	1954	1	4	L	—
	5	3	L	—		2	1	L	—
	6	3	L	o		2	5	L	+
	7	4	L	+		4	5	L	o
	8	5	L	+		5	3	L*	—
	9	2	L*	—		6	7	H*	+
	10	6	H	+		7	3	L*	—
	11	10	H	+		8	6	H	+
	12	7	H*	—		9	10	H*	+
1951	1	3	L	—		10	5	L*	—
	2	5	L*	+		11	10	H	+
	3	10	H	+		12	9	H*	—
	4	6	H	—	1955	1	9	H	o
	5	6	H*	o		2	11	H	+
	6	3	L	—		3	7	H	—
	7	2	L*	—		4	7	H	o
	8	6	H	o		5	7	H	o
	9	6	H	+		6	8	H*	+
	10	8	H	+		7	1	L	—
	11	7	H*	—		8	4	L	+
	12	3	L	—		9	4	L	o
1952	1	3	L	o		10	5	L*	+
	2	3	L*	o		11	10	H*	+
	3	6	H	+		12	5	L	—
	4	8	H	+	1956	1	2	L	—
	5	10	H	+		2	4	L	+
	6	10	H*	o		3	4	L*	o
	7	4	L	—		4	8	H*	+
	8	4	L	o		5	5	L*	—
	9	3	L*	—		6	8	H*	+



Year	Month	Frequency of pityriasis rosea	Two categories*	Change	Year	Month	Frequency of pityriasis rosea	Two categories*	Change
1956	7	3	L	—	1957	10	3	L*	—
	8	3	L*	0		11	9	H*	+
	9	6	H	+		12	4	L*	—
	10	10	H	+	1958	1	7	H	+
	11	11	H	+		2	8	H	+
	12	8	H*	—		3	12	H	+
1957	1	3	L*	—		4	11	H	—
	2	11	H*	+		5	8	H	—
	3	4	L	—		6	6	H	—
	4	2	L	—	7	9	H	+	
	5	3	L	+	8	9	H*	0	
	6	3	L	0	9	5	L	—	
	7	1	L	—	10	4	L*	—	
	8	3	L*	+	11	13	H	+	
	9	6	H*	+	12	6	H*	—	

\* 6 patients a month or more =H  
Less than 6 patients a month=L

Thus, no increase in the incidence of pityriasis rosea was demonstrable in Gothenburg during the period 1949 to 1959. Nor did the incidence tend to be high for several years at a time and then low for several consecutive years. This was proven with the same test as applied to the months, on page 19.

### SEX DISTRIBUTION

Data on the sex distribution of pityriasis rosea vary in the literature. The disease has been reported to be equally frequent in the two sexes, the incidence to be higher in men, or women to be those most susceptible. In a series of 1,008 patients with pityriasis rosea, the ratio of women to men was 2:1 (36). The sex distribution in 13 other series in the literature (30, 57, 75, 76, 109, 118, 147, 182, 185, 186, 196, 198), comprising altogether 2,104 cases, is given in Table 4.

In a series from Berlin (12), the incidence of pityriasis rosea was calculated as  $0.54 \pm 0.03$  per cent in men, and  $0.64 \pm 0.03$  per cent in women. An almost equal frequency in the two sexes was reported in a Leipzig series (12).

#### *Present Series*

The present series of 826 patients was composed of 431 men (52.2 per cent) and 395 women (47.8 per cent).

Comparison of the sex distribution in our series with that in the population of the city of Gothenburg showed, on Chi-square testing, a significant predominance of men

Table 4. Sex Distribution of Pityriasis Rosea in 13 Series from the Literature.

Author	Number of cases	Number of females	Number of males
Tandler 1896	14	4	10
Towle 1904	202	133	69
Szaboky 1906	119	39	80
Little 1914	174	89	85
Highman 1923	52	30	22
Weiss et al. 1927	380	245	135
Chatschaturijan 1931	146	65	81
Glaubersohn 1931	156	97	59
Thomson and Cumings 1931	156	82	74
Percival 1932	234	103	131
Marcozzi 1934	82	32	50
Vass 1948	270	151	119
Heite 1957	119	67	52
Total number	2104	1137	967

among the patients (Table 5). As far as can be ascertained, men and women have enjoyed an equal opportunity of admission to the hospital. No data are available suggesting that either of the sexes evidenced less willingness to enter hospital for treatment of pityriasis rosea.

Table 5. Percentage of Men in the Present Series of Pityriasis Rosea compared with Percentage of Men in Gothenburg.

	Total Number	No. of Men	Statistical testing
Present Series (1949—1959)	826	431 (52,2 %)	Significant
Gothenburg (1958)	353687	171115 (48,4 %)	$\chi^2=48,5$

The approximately equal sex distribution is not in agreement with the mean distribution recorded in the literature. However, the latter series contain no mention of the relationship between the sex distribution of the patients and that of the populations served by the hospitals.

Chi-square testing of the present series against each of those from the literature listed below (Table 4) revealed a significant difference at the 0.01 per cent level. A possible explanation of this difference is that the sex distribution of the populations from which the series were collected was different.

It would seem, then, that men and women are equally susceptible to pityriasis rosea. The sex distribution in the series above differ from that of the district served by the hospital, the city Gothenburg.

Table 6. Age Distribution of Pityriasis Rosea in 10 Series from the Literature.

Author	0—9	10—19	20—29	30—39	40—49	50—59	60—69	70—79	Total no.
Weiss et al. 1927	41	55	68	36	18	4			222
Weiss et al. 1927	13	36	56	38	12	2			157
Glaubersohn 1931	13	32	71	24	11	5			156
Crissey 1956	65	205	390	250	100	50	20	2	1082
Heite 1957	8	18	44	28	10	9	1		118
Total number	140	346	629	376	151	70	21	2	1735
	0—10	11—20	21—30	31—40	41—50	51—60	61—70	71—80	Total no.
Little 1914	33	47	31	22	7	5	1		146
Highman and Rulison 1923	4	6	13	21	3	3	1		51
Thomson and Cumings 1931	30	49	39	24	4	3	1	1	151
Kogoj and Farkas 1932	3	18	20	4	8	1			54
Percival 1932	29	76	80	31	17	1			234
Total number	99	196	183	102	39	13	3	1	636

### AGE DISTRIBUTION

Pityriasis rosea is rare in both the very young and very old. Occasional instances are often published of patients under the age of two years (24, 36, 57, 97, 106, 109, 141, 150, 196, 198) or over sixty (2, 76, 98, 109, 120, 185, 196, 198).

The most common age of onset falls in the second and third decades; it has been reported as the 25th year of life in Munich, Berlin, and Leipzig, as the 30th year in Edinburgh, New York, St. Louis, and Vienna, while in London the age curve shows two peaks — at 15 and 25 years. A feature common to the different age curves is that they decline steeply after the age of 45 years (12). Table 6 gives the age distribution in nine different series in the literature (36, 57, 75, 76, 98, 109, 147, 185, 198) comprising altogether 2,371 cases.

#### *Present Series*

The age distribution of the series as a whole, as for men and women separately, was divided into five-year classes as in Figs. 1, 2, and 3. A feature common to all three categories is a steeply rising incidence of the disease during childhood, a plateau-like maximum at the age of 10 to 34 years, followed by a slow decline over the age of 35 years. The youngest patient was one, the oldest 83 years old. Chi-square testing against the distributions which would be present if the incidence were equal in all the age classes showed, with 99.9 per cent confidence, these variations to be real. This applies to all three categories.

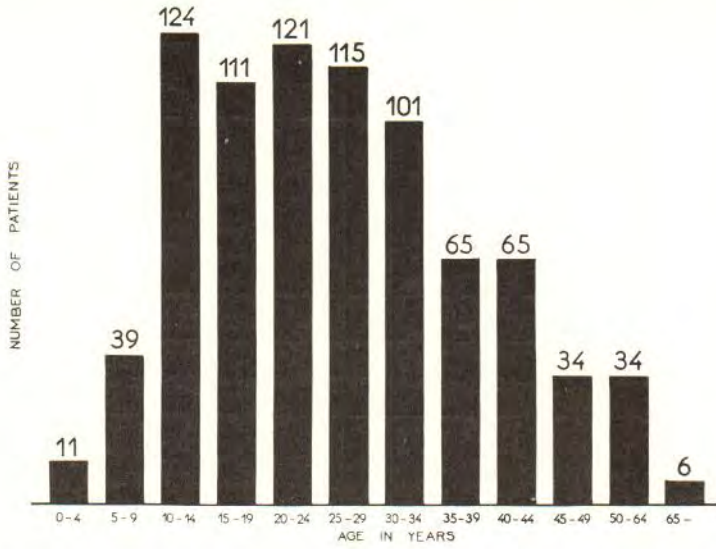


Fig. 1. The Frequency Distribution of the Age at Onset of Pityriasis Rosea among 826 Patients.

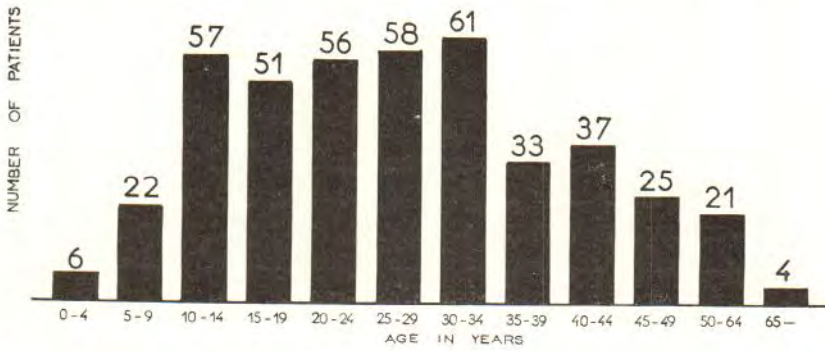


Fig. 2. The Frequency Distribution of the Age at Onset of Pityriasis Rosea among 431 Males.

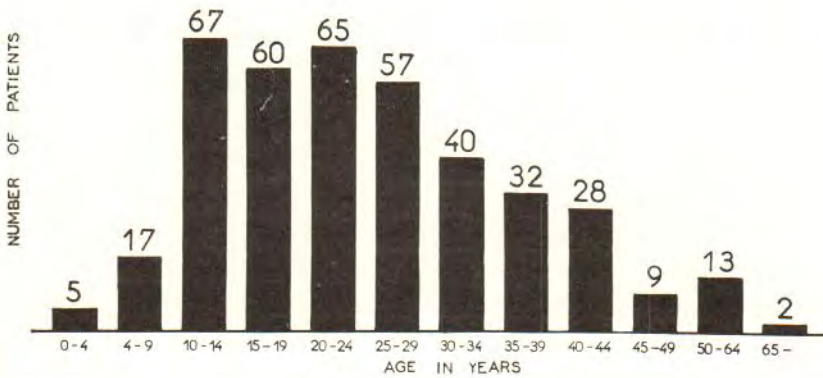


Fig. 3. The Frequency Distribution of the Age at Onset of Pityriasis Rosea among 395 Females.

On comparing the age distributions in men and women in the different five-year classes, women after the age of 30 years showed a significantly higher frequency than men (Chi-square test), (Table 7).

Table 7. Age at onset of pityriasis rosea in present series — males compared with females.

Age group	Males of present series		Females of present series	
	No.	Per cent	No.	Per cent
0—4	6	1.4	5	1.3
5—9	22	5.1	17	4.3
10—14	57	13.2	67	16.9
15—19	51	11.8	60	15.2
20—24	56	13.0	65	16.5
25—29	58	13.4	57	14.4
30—34	61	14.2	40	10.1
35—39	33	7.7	32	8.1
40—44	37	8.6	28	7.1
45—49	25	5.8	9	2.3
50—64	21	4.9	13	3.3
65—	4	0.9	2	0.5
Total	431	100.0	395	100.0

$$\chi^2=188.21 \quad p<.001$$

Comparison of the frequency of pityriasis rosea cases divided into five-year classes with the corresponding frequency in the population of Gothenburg, shows the variations in the age curves in the pityriasis rosea series to be true variations and not the manifestation of any special age structure in Gothenburg's population.

Owing to the large difference between the numbers of pityriasis rosea patients and the population of Gothenburg, a semilogarithmic scale was used to facilitate the comparison (Figs. 4 and 5). As this brings the curves nearer to each other, it permits more reliable comparison of their fluctuations. In the age groups 50 to 64 years, three five-year classes of patients have been grouped together as the population is treated in that manner in the official Swedish Population Statistics of 31 December, 1950. The striking difference between the population curve and the pityriasis rosea curve has been statistically proven by Chi-square testing.

The age distribution in the present series has been compared with that in some series in the literature comprising 1,735 cases (Table 6). Chi-square testing of our series against each of those from the literature revealed significant differences.

The age classes over 50 years were eliminated from the tests, since these classes were not comparable owing to different classification. The Chi-square value obtained is 37.8 for four degrees of freedom, a value significant beyond the .001 level.

This significant difference might be due to discrepancies in the age distribution of the populations from which the series were collected. It would have been interesting to compare the present investigation with similar studies in the literature — that is, with studies founded on a comparison between pityriasis rosea patients and the population.

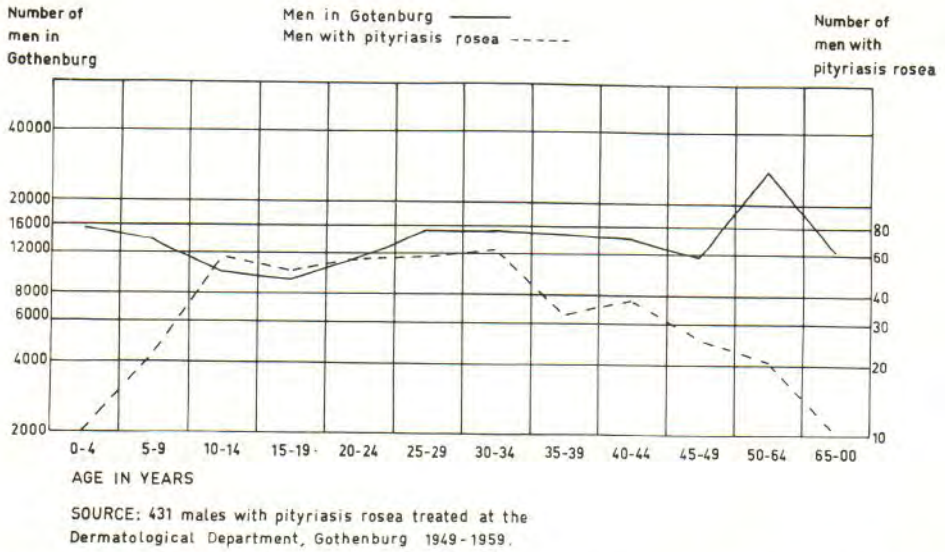


Fig. 4. Age Distribution in Five-Year Groups of Males with Pityriasis Rosea Compared with that of the Total Number of Males in Gothenburg, 1950.

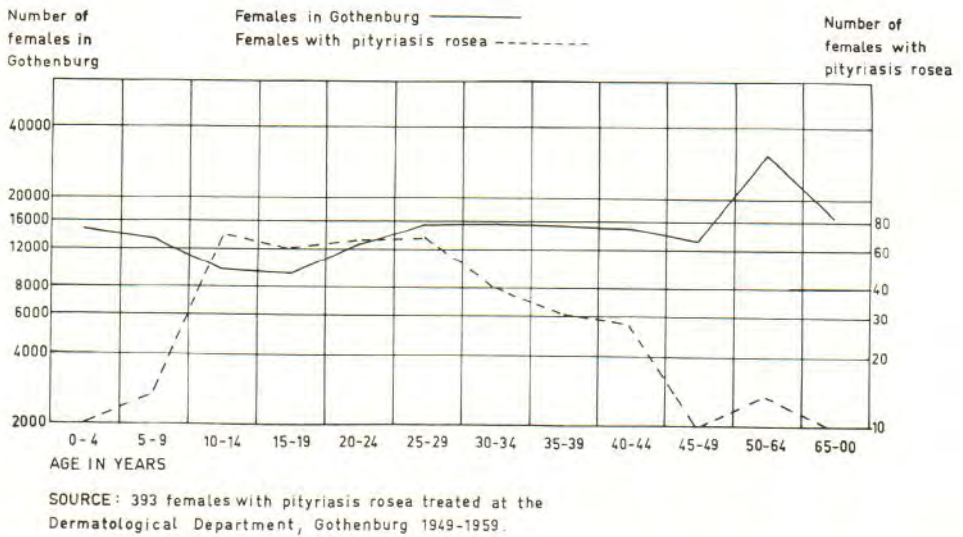


Fig. 5. The Age Distribution in Five-Year Groups of Females with Pityriasis Rosea Compared with that of the Total Number of Females in Gothenburg, 1950.

But this is not possible, since the literature records no such comparisons. However, the general view would appear to be that the incidence of pityriasis rosea is highest between the ages of 10 and 40 years.

## SEASONAL VARIATIONS

*Pityriasis rosea* seems to occur in all countries irrespective of climate (36). Most writers believe there to be seasonal variations in the incidence of the disease, although this has been questioned by some (182, 198). Data on the type of the seasonal variations are, however, contradictory. The views most widely expressed are that the disease is most common in the spring and autumn (71, 73, 76, 93, 101, 123, 143, 146, 150, 183, 190) or that it most usually occurs during "the cold part of the year" (36, 99, 120, 147, 165, 202). It has also been said that it is most frequent during the autumn and winter (71, 136, 207), during the autumn (109, 186), the spring (238), the summer (56), and during the transitional periods between different seasons (140, 182). Changes in the seasonal variations have also been noted from year to year, the disease being most common in the winter of one year but during the summer of another (1, 62). Table 8 gives the monthly figures for the incidence of *pityriasis rosea* in nine series in the literature (75, 76, 98, 109, 185, 186, 190, 198, 207), comprising altogether 1,441 patients.

### *Present Series*

In our series there are proven seasonal variations in the incidence of *pityriasis rosea*, a fall being noted during the summer months and January, and a rise during the spring and autumn, particularly during the latter season. The seasonal variations are strikingly constant from year to year. They are not caused or influenced by seasonal fluctuations in the total numbers of first attendances for skin disorders at the Department of Dermatology in Gothenburg.

The numbers of *pityriasis rosea* cases in each month during the period 1949 to 1959 differ appreciably (Table 3, Fig. 6). In order to rule out the possibility that the fluctuations in frequency were due to chance, the series was analysed as to the presence of serial correlation.

The incidence figures were classed into two categories termed "high" (H) and "low" (L) (Table 3). The letters H and L were entered according to the monthly incidence of *pityriasis rosea* during a given month, for six patients or more (H) or under six patients (L). The limit was put at six patients as this was the median of the series and a natural dividing point. This gave a new time series made up of the symbols H and L. Of the 120 months, 64 were marked H and 56 L. In the new series the number of runs ( $r$ ) was counted, a run being a group of the same consecutive symbols (H or L). An asterisk is placed at the end of each run in the figure. There were 46 runs ( $r=46$ ). To discover whether 46 was so low a figure as to indicate clustering or bunching in the sample of 120, the one sample run test was used. If there were clustering, it would result in too few runs. The sampling distribution of  $r$  was sufficiently well approximated by a normal distribution, as the sample was large.

The significance level was .05. As the direction of the deviation from randomness was not predicted, a two-tail region of direction was used ( $p=.0064$ ). Inasmuch as the probability of the observed occurrence was .0064 and the level of significance was .05, our decision was to reject the null hypothesis that there is no serial correlation in favour of the alternative hypothesis that there is.

In other words, the incidence of *pityriasis rosea* in different months was not due to chance distribution but tended to be high for several months at a time and low for several months.

The different years show the incidence of *pityriasis rosea* to tend to be lower during the summer months and around the change of the years (Table 3), (Fig. 6). In order to

Table 8. Monthly Distribution of 1,441 Pityriasis Rosea Patients in the Literature.

Author	Number of cases	Jan.	Febr.	March	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Towle 1904	194	18	20	17	14	15	25	8	7	19	16	26	9
Little 1914	174	14	10	14	10	12	8	23	14	15	23	10	21
Highman 1923	51	8	6	13	4	2	1	0	0	2	4	4	7
Weiss et al. 1927	380	31	29	36	35	44	20	20	30	36	33	29	37
Wile 1927	262	19	11	13	23	18	15	15	26	36	25	36	25
Thomson and Cummings 1931	156	13	14	15	12	10	11	9	2*	14	23	19	14
Kogoj and Farkas 1932	46	6	4	5	6	0	3	5	3	3	7	1	3
Ullman 1932	59	8	4	2	7	7	3	5	2	4	7	7	3
Heite 1957	119	14	8	11	16	13	9	9	7	7	7	10	8
Total number	1441	131	106	126	127	121	95	94	91	136	145	142	127

\* unreliable number



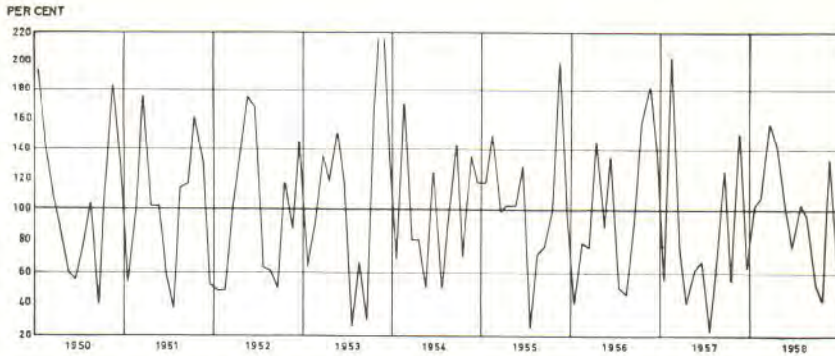


Fig. 6. Percentages of Centered Twelve-Month Moving Average for Patients with Pityriasis Rosea, Dermatologic Department, Gothenburg 1950—1958.

prove statistically the validity of these seasonal variations in the incidence of pityriasis rosea, calculations were made with the centred 12-month moving average method.

A long-term upward or downward movement in the frequency curve of pityriasis rosea patients resulting from a trend might affect comparison of the relevant frequency of a given month with the average monthly incidence for the year. As January comes at the beginning of the year, it is less affected by the upward or downward trend than the months towards the end of the year. Such an upward or downward tendency would distort the picture of seasonal variations. A trend showing an upward tendency would exert the effect that the frequency would appear to be higher during the late months of the year than is actually the case. The middle months of the year would not be biased as much as those at the beginning and end of the year. Consequently, it would be better if each month could be treated as the middle of its own particular "year" or twelve-month period. The calculation of consecutive 12-month averages is called the "12-month average". The general level of series of frequency is tested on page 7. This test did not show the level to change, but in order to obtain the greatest possible accuracy, the 12-month average method was used in the computations of the seasonal index.

The moving averages consume a number of observations at the beginning and end of the time series given in Table 3. Since this precludes computation of the moving averages for 1949 and 1959, those two years are not shown in the table. Each frequency value for the number of pityriasis rosea cases per month is expressed in per cent of the corresponding centred moving average. The resulting value shows, as would be expected, seasonal variations with low values in the summer and at the change of the years. These variations appear on the whole to be the same from year to year. However, the agreement between the years is not exact, the fall in incidence being sometimes more marked during July or August, for instance, or during May and June.

The seasonal index was calculated in the following manner: The mean value of the deviations between the individual monthly values and their respective means was calculated. Only the five intermediate values were used for each month, the highest and lowest of the seven monthly values being excluded in order to limit the dispersion of values. This gave a new mean of the twelve modified mean values, one for each month. By dividing each modified mean value by the new mean, and then multiplying by 100, a seasonal index was obtained as a measure of the months' mutual relationship as regards the incidence of pityriasis rosea.

Since the dispersion between the five values in each month used as a basis for the calculation of the modified means was not particularly great, the reliability of the seasonal index may be regarded as high. A seasonal index is a stable pattern of the yearly seasonal variation, that is, a pattern of the seasonal variation which tends to repeat itself year after year. Even a stable seasonal pattern, however, is not perfectly repetitive from year to year.

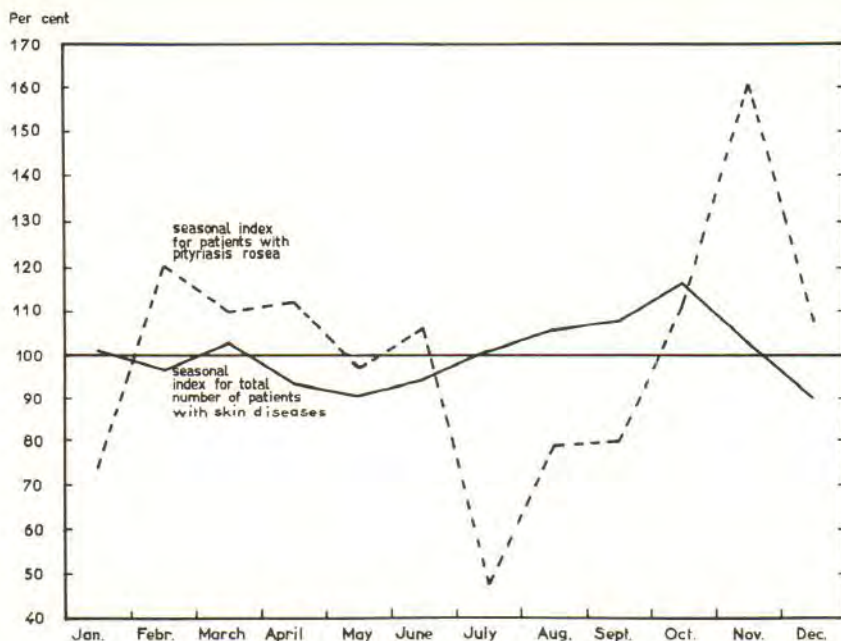


Fig. 7. Percentages of Moving Average and Seasonal Index for Patients with Pityriasis Rosea and for the Total Number of Patients with Skin Diseases at the Dermatological Department in Gothenburg 1949—1959.

Since the relatively low incidence of pityriasis rosea cases during the summer months and at the change of the year might have reflected a corresponding decrease in the total number of first attendances at the Department of Dermatology at these periods, the seasonal index for the total number of first attendances at the department during the period 1949 to 1959 was calculated in the same manner as described for pityriasis rosea. This index was fairly even throughout the year, showing no seasonal variations corresponding to those in the pityriasis rosea series (Fig. 7).

#### CHARACTER OF THE SEASONAL CURVES

True epidemics of pityriasis rosea are maintained generally not to occur. Nevertheless, epidemic peaks have been noted on a few occasions. During the period 1950 to 1952, one was reported from the Transvaal (120).

##### *Present Series*

The configuration of the seasonal curves for the incidence of pityriasis rosea was studied as regards the manner in which the rise or fall occurred. This revealed a gradual increase and a gradual decrease in the frequency of the disease. In other words, the incidence does not rise steeply to a high level and remain there with chance variations, which would have been a possible alternative.

No comparison was made with corresponding frequency curves for epidemic diseases, and consequently no hypothetical conclusions can be drawn by analogy as regards the aetiology of the disease on this basis.

The clustering of high and low values for the monthly incidence of pityriasis rosea might have been due to a few major changes, or to the persistence of a movement in a given direction. Our intention, therefore, was to ascertain whether the incidence of patients with pityriasis rosea showed any tendency to move consecutively upwards in the runs more often than would have been the case with independent frequency; a variant of the sign test was used. A test for persistence of movement in a given direction may be made by marking each observation, except the first, plus or minus according to its difference from the preceding observation, and counting the number of runs up and down. In Table 3, the column marked "change" shows whether the incidence of patients with pityriasis rosea each month was higher (+) or lower (—) than that of the preceding month. The longest movement in one direction was the four-month decline from January 1951 to May 1951. There were six three-month movements, the rises from February 1949 to May 1949, from February 1952 to May 1952, from September 1956 to November 1956, from December 1957 to March 1958, and the falls from November 1953 to February 1954, and from March 1958 to June 1958. Some months the frequency was the same, and the equal frequency value next to the first were marked "O". The number of runs up and down, designated R, was approximately normally distributed. The total number of frequencies, designated n, was 120.

The statistical test shows that, were there no real persistence of movement in the same direction, the probability of so few runs up and down would be less than .01. It is evident, then, that the frequency shows a tendency to move consecutively in the same direction more often than would be the case with independent observations. The clustering of high and low values is, therefore, not due (at least not exclusively) to a few major changes, but in some measure to cumulative movements upwards.

This infers that the "epidemic" accumulations of pityriasis rosea cases are the product of a successive rise in incidence.

#### "FAMILIAL OCCURRENCE" OF PITYRIASIS ROSEA

A few cases of pityriasis rosea sometimes occur within the same intimate environment. But this is regarded as rare. Among 150 cases of the disease there was no such association (73), among 174 it was observed on one occasion (109), and among 234 cases on two occasions (147).

In *two* persons, members of a family or people meeting frequently the disease has been reported in the following combinations: Simultaneous onset in man and wife (51); mother and son contracting the disorder within two weeks of each other (198); simultaneous onset in mother and daughter (111); simultaneous onset in two sisters (119); two friends with onsets separated by one week (100); two siblings implicated within three months (185); two siblings (198); two women friends with onsets separated by four weeks (207); man and wife at an interval of two weeks (218); man and wife (50); two sisters at an interval of one week (109); mother and daughter (202); two members of a family (37); man and wife (201).

*Three* persons from the same intimate environment, in whom the onsets occurred within a few months of each other, have also been described: three soldiers in the same company (143); three members of a family within six weeks of each other (130); three members of a family (180); two young siblings and an adult friend of the family within four months (170); three prostitutes from the same brothel (31); three brothers (5).

Four cases in the same environment have been reported once (40).

In some of the examples listed above, the disease involved physicians or their families. Twelve of 202 patients with pityriasis rosea belonged to physicians' families (186).

On the suspicion that pityriasis rosea might be contagious, attempts have been made experimentally to transmit the disease by inoculation. In a few instances these experiments were regarded as successful. Three weeks after the intracutaneous injection of a saline extract from pityriasis rosea scales, a mild form of the disease without a primary plaque developed in a human subject (185). The inoculation of the contents of blisters induced by the application of cantharidin over pityriasis rosea lesions led to an outbreak of the disease in four persons. In these cases the incubation period ranged from a few days to one week, the attack was mild, and the skin lesions soon regressed (185). Other investigators have, however, failed to communicate the disease to humans (61, 83, 100, 120, 185) or to animals (61, 100).

#### *Present Series*

A number of the patients in this series, altogether 108, were questioned with especial regard to "familial" occurrence of pityriasis rosea. Four of them reported that similar cases had occurred among persons in their intimate environment. The diagnosis was in two instances verified by a physician. In the larger part of the series, altogether 718 patients, in which the data had been collected from hospital records, only one record of such "familial" occurrence was found. However, information on this aspect of the disease was almost invariably lacking in the records of these 718 patients. But our own observations prompt us to assume that the number of "familial" cases was in fact appreciably higher in this larger part of the series too.

On one occasion, three close friends contracted the disease, on another two friends, and on two occasions two cases occurred in the same family. The interval between the onsets in persons belonging to the same environment was less than one month in these instances (Table 9).

Table 9. Cases of Pityriasis Rosea with Possible Transmission of the Disease

No.	Relationship between Closely Associated Persons with Pityriasis Rosea about the Same Time	Time between the Outbreaks
1	Father and Son	A Few Days
2	Father and Daughter	3 Weeks
3	Two Friends	1 Month
4	Three Friends	Simultaneously
5	Two Friends	2 Days

Our observations seem to infer that pityriasis rosea within the same intimate environment is of higher incidence than has hitherto been assumed.

## INCIDENCE OF ALLERGIC MANIFESTATIONS IN RELATIVES

Since we had demonstrated a higher incidence of eczema in the histories of patients with pityriasis rosea than in healthy persons (see below, page 23), 108 patients and 108 controls were questioned as to the occurrence of asthma, hay fever, urticaria, and eczema in their families — including parents, grandparents, siblings, uncles, aunts, cousins, and children. This revealed a significantly higher incidence of asthma and eczema in the families of pityriasis rosea patients, while no statistically proven differences emerged as regards hay fever or urticaria (Chi-square test), (Table 10).

Table 10. Incidence of Allergic Diseases in Families of 108 Pityriasis Rosea Patients and 108 Matched Controls.

Type of disease	Patients' families		Controls' families		Statistical testing
	no.	per cent	no.	per cent	
Asthma	22	20.4	11	10.2	Significant
Hay fever	7	6.5	11	10.2	Not significant
Urticaria	8	7.4	12	11.1	"
Eczema	35	32.4	19	17.6	Significant

A source of error in this investigation was, of course, the patients' unreliable information on the diseases of their relations. Another was the lack of information on the size of the families. But both these sources of error should have been largely eliminated by the comparison with the matched controls. The likelihood that pityriasis rosea patients should have been more interested in possible allergic disorders in other members of their families, owing to their own skin disease, was rated as small.

## INCIDENCE OF OTHER DISEASES

Patients with pityriasis rosea were investigated as to the occurrence of 1) earlier diseases, and 2) coexistent diseases.

1) *Earlier Diseases**Present Series*

The main object was to determine whether certain diseases or groups of diseases were especially common among patients contracting pityriasis rosea.

The total number of certain illnesses, altogether 42 different conditions, recorded in the lifetime of each patient up to the onset of pityriasis rosea was investigated. Comparison with the control group was possible, since the controls were matched as regards number, age and sex distribution. Thus, 108 pityriasis rosea patients and 108 controls were carefully questioned by the same interrogators. The incidence of diseases in these two groups is given in Table 11.

Table 11. Frequency of Certain Illnesses Reported by 108 Patients with Pityriasis Rosea and 108 Matched Controls.

Type of Illness	Distribution of Illness			Statistical Testing (1 % Level)	Type of Illness	Distribution of Illness			Statistical Testing (1 % Level)
	No. of Patients	No. of Controls	Differences			No. of Patients	No. of Controls	Differences	
Anemia	21	25	4	Not Significant	Mental Disease	11	3	8	Not Significant
Appendicitis	14	25	11	"	Mumps	54	59	5	"
Asthma	5	0	5	"	Nephritis	0	5	5	"
Cholecystitis	2	5	3	"	Ovarian Disease	4	4	0	"
Cutaneous Infections	70	37	33	Significant	Otitis	29	28	1	"
Cystitis	26	15	11	Not Significant	Peptic Ulcer	7	7	0	"
Diabetes Mellitus	0	0	0	"	Pertussis	57	67	10	"
Diphtheria	5	3	2	"	Polioomyelitis	0	0	0	"
Eczema	37	15	22	Significant	Psoriasis	2	2	0	"
Erysipelas	2	2	0	Not Significant	Pyelitis	3	1	2	"
Goitre	1	1	0	"	Renal Calculus	4	3	1	"
Hay Fever	5	5	0	"	Rheumatoid Arthritis	18	9	9	"
Heart Disease	5	8	3	"	Rubella	49	61	12	"
Herpes Simplex	47	37	10	"	Scarlet Fever	21	17	4	"
Herpes Zoster	1	6	5	"	Sinusitis	15	11	4	"
Jaundice	4	4	0	"	Superficial Mycoses	20	13	7	"
Malignant Tumour	2	1	1	"	Tonsillitis	66	57	9	"
Measles	92	94	2	"	Tonsillectomy	17	18	1	"
Meningitis	7	4	3	"	Tuberculosis (Pulmonary)	3	5	2	"
Menstrual Disorders	9	10	1	"	Urticaria	11	10	1	"
					Varicella	58	61	3	"

On the whole, the two groups correspond very closely as regards the incidence of diseases. The figures for the epidemic diseases of childhood are virtually identical. But statistically significant differences were demonstrable between the two groups with respect to two disease categories, cutaneous infections and eczema, which were more common in the patients than in the controls. No differentiation was made within these two categories, so that the former includes furuncles, carbuncles, and impetigo contagiosa, and the latter contact, atopic, and seborrhic dermatites.

In addition to cutaneous infections, the incidence of other infectious diseases was investigated, such as erysipelas, meningitis, otitis, and sinusitis. But the incidence of these infections was not found to be statistically higher in the pityriasis rosea patients, and the study afforded no evidence of any general increase in susceptibility to infection among these patients. In view of the inclusion in the eczema group of the atopic form, and for other reasons, the incidence of asthma, hay fever, and urticaria was also investigated. These disorders were found not to occur in any statistically proven higher incidence among the pityriasis rosea patients than among the controls. The frequency of a history of fungous infections of the skin was equal in the patients and controls, which was noted against the background of the view cited in the introductory section of this paper — that pityriasis rosea is a mycosis or mycid. Nor did any significant differences emerge between the two groups as regards any of the other diseases investigated.

With respect to the diseases formerly reported as *coexisting* with the onset of pityriasis rosea (see below), such as jaundice, herpes simplex, and psoriasis, our study failed to demonstrate any differences between patients and controls. The lower incidence of pulmonary tuberculosis recorded in pityriasis rosea patients in the literature was not demonstrable in the present series. Data on syphilis were available in neither group.

Thus, a statistically proven higher incidence of cutaneous infections and eczema was found in the pityriasis rosea patients than in the matched controls, while no significant differences between the two groups were demonstrable with respect to the 40 other diseases investigated.

## 2) *Coexistent Diseases*

Syphilis has been stated to coexist with pityriasis rosea in many case reports (181 and others), and the common coincidence of the two conditions has been emphasised (11, 48, 153). In a series of 61 pityriasis rosea patients, syphilis coexisted in two (11), and in another series of 647 patients syphilitic symptoms were noted in 47 (47). The high incidence of syphilitics among pityriasis rosea patients may be due to 1) a true rise in incidence, 2) misinterpretation of a luetic exanthem as pityriasis rosea, or 3) a pityriasis rosea-like exanthem resulting from antisymphilitic therapy with bismuth or salvarsan.

In contrast to syphilis, tuberculosis is reported to be rare in combination with pityriasis rosea (11, 153). In the series of 647 pityriasis rosea patients mentioned above, active tuberculosis was present in only three persons (47). Among 85 other pityriasis rosea patients, tuberculosis was in an active phase in three, and the author found no evidence suggesting the disease to be a form of tuberculid (61); the view that it is has been expressed earlier (105). Tuberculin tests were carried out in 18 pityriasis rosea patients

without affording any conclusive results (185). Reports of tuberculosis in combination with pityriasis rosea have been recorded (117).

Other disorders have in a few instances been reported to coexist with pityriasis rosea: Hodgkin's disease (168), jaundice (109), facial paralysis (82), sixth-nerve paralysis (164), aseptic urethritis (Bory, cited in 149), lymphogranuloma (136), herpes simplex (189), pleurisy (138). In one patient with both psoriasis and pityriasis rosea, the two conditions ran their courses apparently without affecting each other (220). (The coexistence of lichen ruber with pityriasis rosea is discussed in the section on "Medication" below).

#### *Present Series*

Erroneous conclusions may be drawn in a hospital series as regards the connexion between two different diseases, since their coexistence may more readily prompt the patient to attend a hospital for consultation. However, this was regarded as improbable in so mild a disorder as pityriasis rosea.

Twelve of 108 patients with pityriasis rosea reported having another disease simultaneously (Table 12). Three patients had rheumatic symptoms and four skin diseases, in two instances eczema, in one herpes simplex, and in one discoid lupus erythematosus.

Table 12. Simultaneous Diseases in 108 Patients with Pityriasis Rosea.

Diagnoses	Number of cases
Rheumatoid arthritis	3
Urinary infection	1
Sinusitis	1
Hidradenitis suppurativa	1
Anaemia	1
Asthma	1
Eczema	2
Herpes simplex	1
Discoid lupus erythematosus	1

Nine of the 42 pityriasis rosea patients admitted to the hospital had a coexistent disease (Table 13). Six of them showed signs of another skin disorder too: three eczema, one psoriasis, one urticaria, and one acne vulgaris. As mentioned earlier, in a few cases another disease such as heart disorder, diabetes mellitus, or urticaria was the chief indication for hospitalization. One woman succumbed to cardiac incompensation; her pityriasis rosea was of very minor clinical importance.

#### POSSIBLE PRECIPITATING FACTORS AND PRODROMATA

Much of the interest raised by pityriasis rosea has been concentrated on different precipitating factors. As regards pregnancy and medication, a possible connexion appears fairly likely. But the situation is another with respect to infections, for instance. A preceding tonsillitis cannot categorically be classified as a disorder precipitating pityriasis



Table 13. Simultaneous Diseases in 42 Hospitalized Patients with Pityriasis Rosea Found on Admission.

Diagnos	Number of cases	Note
Arteriosclerotic heart disease + diabetes mellitus	1	dead
Diabetes mellitus	1	
Obesity + essential hypertension	1	
Pernicious anaemia + contact dermatitis	1	
Thrombophlebitis + chronic eczema	1	
Dermatitis seborrhoeica	1	
Acne vulgaris	1	
Urticaria + angioneurotic oedema	1	
Psoriasis	1	

rosea, since the tonsillitis might also be thought to be an initial symptom belonging to the clinical features of pityriasis rosea. In view of this uncertainty, the following classification of "precipitating factors" and "prodromal symptoms" was selected: To the precipitating factors we assigned pregnancy, medication, seborrhoeic dermatitis, garments, infections (common cold, tonsillitis, dental infection, cutaneous infection), mental stress and earlier local skin lesions. Under the heading of prodromal symptoms we placed fatigue, nervousness, fever, headache, gastrointestinal symptoms, joint pain, and malaise.

#### I. Possible Precipitating Factors

##### a) Pregnancy

The proportion of pregnant women among pityriasis rosea patients has been found to be high. Eighteen per cent of 76 female patients were pregnant in one series, while this applied to only 6 per cent of a control group of 100 women with other skin disorders. This high incidence of pregnant patients in the pityriasis rosea series was attributed to these women having worn many new garments and taken more baths than usual, but it may also have been due to hormonal factors (32). Among 37 other pityriasis rosea patients there were two pregnant women who later gave birth to normal children (163).

##### Present Series

Forty women of fertile age with pityriasis rosea were questioned about their menstruation. Five reported themselves to be pregnant. In a control group of 40 women with other skin diseases and matched as to age and civil status, two said they were pregnant. There is no statistically proven difference between the two groups as regards the incidence of pregnancy.

Chi-square testing of the incidence of pregnant women in our series and in the series of 76 patients mentioned above showed a statistically significant predominance of pregnant patients in the latter series. The underlying reason cannot be determined. It may be due to chance, or to differing composition of the series.

## b) Medication

It has been maintained that skin lesions of the pityriasis rosea type are associated with medication with different therapeutic agents such as gold (89, 208), salvarsan (11, 27, 46, 132, 139, 178, 200, 211), and bismuth (29, 38, 188). Twenty-two patients treated with bismuth had different types of skin changes attributed to the bismuth medication; of these, fourteen changes resembled those of pityriasis rosea (96). Another series of eight patients in whom pityriasis rosea followed bismuth medication has also been reported (38). Features common to the pityriasis rosea conditions precipitated by medication are stated in the literature to be a prolonged course, a striking resistance to therapy, and subsequent marked hyperpigmentation at the site of the skin lesions. In certain patients, the pityriasis rosea lesions induced by medication have been reported to be accompanied by lichen ruber-like changes. However, transition from a characteristic clinical picture of pityriasis rosea to one of lichen ruber has been described without there being any evidence of drug provocation (6, 10, 86, 109, 112, 120, 167, 172, 185, 195). Although gross examination might reveal the features of pityriasis rosea, the histologic appearances resembled those associated with lichen ruber (96).

*Present Series*

One hundred and eight pityriasis rosea patients were questioned as to their intake of medicines during the weeks immediately preceding the onset of the disease. Of the agents mentioned earlier as precipitating skin lesions resembling those of pityriasis rosea, gold had been given to one patient. He suffered from rheumatoid arthritis and had for a period prior to the outbreak of the skin disease received a long course of gold injections. The duration of his pityriasis rosea was unusually long, three months, and was followed by very pronounced hyperpigmentation. None of the patients had been given bismuth or salvarsan. Before the outbreak of the disease, 27 patients had taken drugs, chiefly analgetics, sedatives, sulphonamides, or vitamins, as is shown in Table 14.

Table 14. Medication of 108 Pityriasis Rosea Patients Prior to Onset of the Disease.

Agent	Number of patients
Analgesics	3
Antihistaminics	1
Enterovioform®	1
Gold	1
Iron	2
Meprobamates	1
Salicylates	4
Sedatives	5
Sulphonamides	3
Vasodil®	1
Vitamins	5

### *Addendum*

When the series had been collected, three patients were seen at the Department of Dermatology who had all been treated with the methopromazine derivate, Mopazine®, for mental disorder. In the acute phase of the skin disease, all three exhibited characteristic pityriasis rosea features — cockade-like lesions with scaly collars distributed in the direction of the lines of cleavage and situated chiefly on the trunk; two patients had primary plaques. However, in the later phase of the skin disorder, the skin lesions were transformed in all three patients to a more lichen ruber-like type. The histologic appearances were in all instances characteristic of lichen ruber, although the clinical features were of the character of pityriasis rosea. Medication with Mopazine is known to have been followed by lichen ruber-like conditions. Discontinuation of the Mopazine therapy led to healing. One of the patients was examined two months after the withdrawal of the agent and was found to have no acute skin lesions at that time, but marked hyperpigmentation.

Like the pityriasis rosea conditions developing after the administration of gold, salvarsan, and bismuth, the dermatoses resembling pityriasis rosea supervening after the intake of Mopazine were characterized by: 1) transformation of the gross appearances to those of lichen ruber, 2) histologic appearances associated with lichen ruber despite the clinical features of pityriasis rosea, and 3) subsequent pronounced hyperpigmentation.

### *c) Seborrhoeic Dermatitis*

The occasional difficulty of differentiating clinically between pityriasis rosea and seborrhoeic dermatitis has often been pointed out (9, 17, 35, 50, 52, 74, 102, 108, 109, 113, 126, 187, 202, 209, 126, and others). Injections of Pyrifer® have been suggested as a diagnostic tool; this agent is reported to speed the healing of pityriasis rosea but not that of seborrhoeic dermatitis (154). Owing to the similarity between the two disorders in atypical cases, it has been supposed that pityriasis rosea is a form of seborrhoeic (55). It has also been claimed that pityriasis rosea has two different forms, acute and chronic, the chronic form corresponding to the type of seborrhoeic dermatitis accompanied by widespread plaques (52). The fact that generalized seborrhoea sometimes presents with an initial plaque similar to that of pityriasis rosea has been taken to corroborate the assumption of an aetiological connexion between seborrhoeic dermatitis and pityriasis rosea (74).

*Pityrosporum ovale* (the bottle bacillus of Unna), which has been regarded as of aetiological importance in seborrhoeic dermatitis, is often found in large quantities in the scales of this disease, but is absent from those of pityriasis rosea (109). *Pityrosporum ovale* has been reported to occur on the scalp of approximately 70 per cent of healthy persons (114).

### *Present Series*

The scalp of 82 patients with pityriasis rosea was examined for seborrhoea. Forty-two apparently healthy controls selected at random and matched as to age and sex were

examined concurrently. The amount of dandruff present was graded as none, slight, moderate, or severe, and assessed independently by two examiners. The findings agreed closely. It was found that "moderate" dandruff was recorded in a statistically significantly higher proportion of the pityriasis rosea patients than in the normal controls. No corresponding differences were noted as regards dandruff in the grades "none, slight, or severe" (Table 15).

Table 15. Seborrhoea of the Scalp in 81 Patients with Pityriasis Rosea and in 42 Controls.

Degree	Pityriasis Rosea	Controls	Statistical Testing
None	17	12	Not Significant
Slight	15	10	"
Moderate	32	9	Significant
Severe	17	11	Not Significant
$\Sigma$	81	42	

In view of the pathogenetic rôle which *Pityrosporum ovale* is thought to play in seborrhoea of the scalp, scrapings from the scalp were examined for this fungus. The scrapings were smeared on glass plates and stained with methylene blue solution according to Löffler. The amount of *Pityrosporum ovale* present was assessed independently by two examiners and graded from 0 to 5. The results agreed closely. Eighty-one pityriasis rosea patients and 53 controls of the same sex and largely the same age were examined in this manner. *Pityrosporum ovale* was demonstrable in all but two of these persons. No statistically proven differences in the quantitative occurrence of the fungus between the two groups were noted (Chi-square testing), (Table 16).

Table 16. *Pityrosporum Ovale* in Smear from the Scalp of 81 Patients with Pityriasis Rosea and 53 Controls.

Degree	Pityriasis Rosea	Controls	Statistical Testing
0	1	0	Not Significant
1	32	24	"
2	24	15	"
3	13	11	"
4	8	3	"
5	3	0	"
$\Sigma$	81	53	

Amount of *pityrosporum ovale* graded 0—5.

#### d) *Garments*

Since it has been noted that the distribution of the skin lesions of pityriasis rosea sometimes coincides with the contact surfaces of different garments, it has been supposed that these might in some way have precipitated or affected the course of the disease. The

garments discussed in this connexion have been new or newly washed (204), and used pieces of clothing kept in store for considerable periods (24, 80, 98). In the latter garments, a certain dampness while in store has been regarded as of importance (197). A causal connexion was claimed between new or stored clothes and the outbreak of pityriasis rosea in some twenty girls (104). Five of 18 other patients had worn new woollen clothes at the onset of the disease (185). 81 of 270 had worn new clothes shortly before the onset (196), and in 73.8 per cent of 61 patients a connexion was thought likely between the wearing of new clothes and the outbreak of the disease — the interval between the contact with the new clothes and the onset being between one and four weeks, most often between one and 2½ weeks (44). The high incidence of pregnant women among pityriasis rosea patients, mentioned earlier, is believed to have been due to the fact that these patients had largely worn new garments (202).

However, the part of garments as a factor precipitating pityriasis rosea has also been questioned (143, 183).

#### *Present Series*

Of 108 patients questioned as to whether they had worn new clothes in direct contact with the skin during the four weeks immediately preceding the outbreak of pityriasis rosea, 27 replied in the affirmative (25 per cent). In a control series of the same size (108 persons) matched as to age and sex, 20 persons (18.5 per cent) had likewise exposed their skin to contact with new clothes during an equal period. Contact with damp clothes was reported by 8.3 per cent of the pityriasis rosea patients, and 6.5 per cent of the controls. Chi-square testing revealed no statistically proven differences between the two groups as regards either new or damp clothes (Table 17).

Table 17. Frequency of Certain Possible Precipitating Factors which Preceded Onset of Pityriasis Rosea in 108 Patients Compared with the Frequency of the Same Factors in 108 Matched Controls.

Type of Precipitant	108 Patients		108 Controls		Statistical Testing
	No.	Per Cent	No.	Per Cent	
Common Cold	15	13.9	19	17.6	Not Significant
Tonsillitis	5	4.6	2	1.9	"
Sinusitis	0	0	1	0.9	"
Dental Infection	4	3.7	4	3.7	"
Cutaneous Infection	4	3.7	4	3.7	"
Mental Strain	15	13.9	12	11.1	"
New Clothes	27	25.0	20	18.5	"
Wet Clothes	9	8.3	7	6.5	"
Oil	18	16.7	12	11.1	"
With One or More Factors	63	58.3	52	48.1	"

### c) Oil

#### *Present Series*

The pityriasis rosea patients included a number of industrial workers in contact with different types of oil. Chi-square testing of 108 of the pityriasis rosea patients and 108 controls failed to reveal any statistically proven difference as regards exposure to oil (Table 17).

### f) Psychogenic Factors

The view has been expressed that pityriasis rosea is due to psychogenic factors (2, 79). Functional nervous disorders were recorded in 66.6 per cent of 119 patients with pityriasis rosea (182). Thirty other patients with this skin disease were examined by a psychiatrist: eight were wholly free from mental disorder, four reported severe emotional stress during the period immediately preceding the onset, and 21 accepted the examiner's suggestion that the disease was "due to the nerves". However, the author believed it improbable that pityriasis rosea was of psychosomatic nature (63).

#### *Present Series*

Of the 108 pityriasis rosea patients examined in this respect, 15 reported exposure to marked mental stress during the weeks prior to the outbreak of the disease. In the control group of 108 apparently healthy persons matched as to age and sex, similar mental traumata during an equal period were reported by twelve persons. No statistically proven difference in the incidence of mental stress was found between the two groups (Chi-square testing), (Table 17).

Both patients and controls were also asked whether they had earlier suffered from mental disorder of a severity requiring medical consultation. No attempt was made to classify the nature of the mental disorders. Mental conditions of this type were reported by eleven of the patients and three of the controls. No statistically significant difference between the two groups was disclosed by Chi-square testing (Table 11).

Thus, the study afforded no evidence that patients with pityriasis rosea had been exposed to mental traumata or had suffered from mental disorders in any higher incidence than the normal population.

### g) Infections

#### 1) Infections of the Throat

It has seemed in several series that throat infections were more frequent in pityriasis rosea patients than is normal. Thus, pharyngitis was recorded in four of 119 patients (182), redness of the throat in five of 18 (185), tonsillitis in nine and other signs of upper respiratory tract infection in three of 30 patients (143), and tonsillitis and pharyngitis in 32 of 46 patients (101). A comparative study on the presence of tonsils in pityriasis rosea patients and controls showed that in 70 consecutive pityriasis rosea patients the tonsils

were demonstrable in 50; in six the tonsils had been removed but had been regenerated; in ten they had been removed but other lymphatic tissue was demonstrable in the throat; in only four had the tonsils been radically removed, with a resulting "healthy" throat. In 300 controls, the tonsils were present in only 20 per cent. On the basis of this study, the author assumed a connexion between pityriasis rosea and infection of the throat (73). The eradication of pyogenic foci in the throat, among other sites, led to fading of the pityriasis rosea eruptions in six patients within periods ranging from 24 hours to four days (87).

The high incidence of throat infections reported in some quarters has not been confirmed in other investigations (36, 93).

The part played as possible precipitating factors by different micro-organisms, particularly streptococci, has been discussed. Samples from the *throat* of fifteen patients with pityriasis rosea showed growth of haemolytic streptococci in one, and of staphylococci in another instance (185). Bacteriologic culture of the *scales* of pityriasis rosea eruptions has given contradictory results as regards the growth of streptococci. In one study, no growth was demonstrable in scale samples from 22 pityriasis rosea patients (183), while in another streptococci were regularly found in such samples from 50 patients (134). Streptococci were isolated on culture of samples from the skin lesions in four of seven patients; however, two of these patients showed signs of current streptococcal infection of the skin in the form of impetigo and retroauricular intertrigo, respectively (149).

Streptococcal vaccine injected intradermally in 55 patients with pityriasis rosea elicited strong reactions in 20, moderate in 29, weak in two, and none in four patients. The test gave negative results in 14 patients during the acute phase of the disease, but later gave positive results. Corresponding injections of staphylococcal vaccine gave positive results in five and negative results in 50 patients. Streptococcal vaccine tests in "healthy" controls gave negative results in every instance (61). Positive intradermal reactions to streptococcal vaccine were demonstrated in 19 of 20 patients, often increasing in strength on consecutive tests, while the corresponding reaction to staphylococcal vaccine was only faintly positive or wholly absent. No reactions were noted in controls (148).

Streptococcal vaccine in intravenous or subcutaneous injections has been used therapeutically in pityriasis rosea (4, 8, 49, 61, 148). But the effect of this treatment may possibly be nonspecific, since favourable results have also been obtained with staphylococcal toxoid, oidiomycin, trichophyton extract, and colloidal lactalbumin (196). With a view to the possible rôle of micro-organisms in pityriasis rosea, the disease has also been treated with chemotherapeutic and antibiotic agents (3, 66, 120, 156, 193).

#### *Present Series*

Since attention has been drawn earlier to the rôle of throat infections in particular as precipitating factors in pityriasis rosea, our study was directed mainly to these infections. Both a history of *earlier throat infection* and throat symptoms at the time of the pityriasis rosea *onset* were taken into consideration. The antistreptolysin titre was also determined owing to the frequent streptococcal derivation of acute tonsillitis.

Earlier signs of tonsillitis were reported by 66 of 108 pityriasis rosea patients. The same applied to 57 of 108 apparently healthy controls of the same age and sex. Tonsillectomy, rated as a sign of earlier marked throat disorder, was recorded in 17 and 18 persons, respectively, in the two groups. Chi-square testing disclosed no statistically proven difference in the incidence of either earlier tonsillar infections or operations in the two groups (Table 11).

At the onset of the disease, five of the 108 pityriasis rosea patients reported having had throat symptoms in the form of a burning sensation, pain, and slight difficulty in swallowing. In the equally large and matched control series, symptoms of this type were recorded in two persons during a similar period. The difference in the incidence of throat symptoms in the two groups was not statistically significant on Chi-square testing (Table 17).

The antistreptolysin titre (ASL) was determined in 43 pityriasis rosea patients and in 19 apparently healthy controls. The determination was usually made during the second to third week after the onset of the disease. The normal values for the ASL-titre are usually stated to be 200 and below. Five patients in the pityriasis rosea group and one in the control group had titres of 400 and above. No statistically proven difference between the two groups was, however, demonstrable (Table 18). Unfortunately, repeated determinations aimed at discovering any possible rise in titre during the further course of the disease could not be carried out.

Table 18. Antistreptolysin Titres in 43 Patients with Pityriasis Rosea and 19 Controls.

Titres	Pityriasis Rosea	Controls	Statistical Testing
Normal	38	18	Not Significant
≥ 400	5	1	Not Significant
Σ	43	19	

## 2) Other Infections

### *Present Series*

As regards a history of *earlier infection*, it was shown above in the section entitled "Earlier Diseases" that pityriasis rosea patients had a significantly higher incidence of cutaneous infections than control persons. One hundred and eight patients with pityriasis rosea and 108 apparently healthy controls matched as to age and sex were also questioned as to signs of common cold, sinusitis, dental infection, and cutaneous infection *during the weeks immediately preceding* the onset of the skin disease. Common colds were reported in 15 and 19 persons, respectively, in the pityriasis rosea and control groups, sinusitis in nil and one, dental infection in 4 and 4, and cutaneous infection in 4 and 4, respectively. Chi-square testing of the frequency figures for the different infections revealed no significant difference between patients and controls (Table 17).

To sum up, it may be said that the study afforded no corroboration of the view that signs of infection of the upper respiratory tract, the teeth, or the skin are more common



in pityriasis rosea patients at the time of onset than in the normal population. Nor did determination of the antistreptolysin titre disclose any higher incidence of streptococcal infections in these patients.

#### h) *Earlier Skin Lesions at the Site of the Primary Plaque*

The development of pityriasis rosea changes at the site of earlier skin lesions has been interpreted as a manifestation of a so-called isomorphic reaction (Köbner phenomenon) (14). Cases have been described in which the primary plaque appeared at the site of friction with clothes (98), around gun wounds (26), around and close to the site of different cutaneous infections (67, 127, 149). However, the possibility has also to be borne in mind that a supposedly infectious agent may have been inoculated through skin lesions. One woman had a primary plaque on the cheek where she had three days earlier been stung by a wasp. This is a very unusual situation for a primary plaque (77). It has also been suggested that the precipitating agent might be inoculated via fleabites (25).

Pityriasis rosea has also been observed to develop from the site of a vaccine inoculation; the disease supervened in five patients vaccinated for smallpox (215). In three other cases, primary plaques developed at the site of vaccination after periods ranging from a few to 35 days (60, 206, 215). The injection of diphtheria serum has also been regarded as capable of provoking pityriasis rosea (157).

#### *Present Series*

We found primary plaques in 58 of 108 patients; seven of them reported skin lesions at these sites when pityriasis rosea developed. The lesions were: varicose veins in one patient, an old scar in one, a scratch in one, a chafe in one, a second-degree burn in one, and intertrigo in one (Table 19). The skin lesions were in every instance superficial.

Table 19. Previous Cutaneous Lesions at the Site of the Primary Lesion of Pityriasis Rosea in 108 Patients.

Type of Previous Lesion	Number of Patients
Intertrigo	1
Varicose Veins	2
Old Scar	1
Scratch Wound	1
Friction of Button	1
Burns	1

The patients were also investigated as to cutaneous inoculations and intracutaneous injections performed during the six weeks immediately preceding the onset of the skin disease (Table 20). One patient had been vaccinated for diphtheria, three for tuberculosis (BCG inoculation), four for poliomyelitis, and one for tetanus, while two had undergone tuberculin tests according to Mantoux. No smallpox vaccination was recorded. In no instance did a primary plaque develop at the site of injection. A marked concentra-

Table 20. Vaccination Preceding Onset of Pityriasis Rosea.

Type of Vaccination	Number of Patients	Time between Vaccination and Onset of P.R.	Primary Lesion of P.R. at the Site of Vaccination
Smallpox	0		
Diphtheria	1	2 Weeks	—
Tuberculosis	3	4 Weeks	—
		—	—
		2 Weeks	—
Poliomyelitis	4	4 Weeks	—
		4 "	—
		4 "	—
		—	—
Tetanus	1	6 Weeks	—
Tuberculin Reaction	2	2 Days	—
		4 Weeks	—

tion of eruptions was noted in one patient around the site of a current tuberculin reaction. The relatively large number of poliomyelitis vaccinations was probably due to current mass inoculation for that disease.

The different factors earlier maintained to precipitate pityriasis rosea were, as emerges in the above, not encountered in any greater incidence among pityriasis rosea patients than among healthy matched controls. This does not, of course, rule out the possibility that one of these factors may in occasional instances have been of importance to the development of the disease.

## II. Prodromal Symptoms

A general malaise, fever, nausea, loss of appetite, headache, joint pain, swelling of lymph nodes, and throat symptoms are sometimes reported to accompany the onset of the skin changes of pityriasis rosea. In some instances these different symptoms precede the exanthem and have the character of true prodromata, in others they appear concurrently. In the following, these two types of symptoms are treated as one group. The symptoms are usually mild, although a marked deterioration in general condition has been reported occasionally at the onset (36, 117, 210, 216). Hepatitis with jaundice has been observed in connexion with the onset of pityriasis rosea (120). Generalized swelling of lymph nodes has not infrequently been described (7, 30, 65, 109, 120, 207, 210). Elevation of body temperature is usually slight or moderate (76, 79, 101, 120, 182, 185, 210). Fever of this degree was noted in 43 per cent of the pityriasis rosea patients in one series (156).

Some authors express the view that constitutional symptoms are common in pityriasis rosea (123, 160, 192). Others deny their existence; they were virtually absent in 202 patients (186). None of a series of 52 patients had constitutional symptoms, which was regarded as remarkable since such symptoms could be expected in at least every tenth fully "healthy" person (76). Data on the incidence of different prodromal symptoms have

been given in various series: 42 of 270 patients had gastrointestinal disorders, while 32 were "nervous" (196). Half of 119 patients had slight fever, fatigue, and headache, while two thirds had sweating and other vasomotor disturbances (123). Joint symptoms were recorded in two, and gastrointestinal symptoms in two, of 18 patients (185). Thirty-seven of 46 patients had prodromata in the form of throat pain, evening fever, and pain in the arms and legs (101), while 47 of 60 patients suffered from general malaise (123). In a major series of pityriasis rosea comprising 1,008 patients, prodromal symptoms occurred in approximately 5 per cent (36). (Throat infections accompanying the onset of pityriasis rosea are discussed in an earlier section, page 30).

#### *Present Series*

One hundred and eight pityriasis rosea patients were questioned as to whether they had, during the weeks preceding, or at the time of, the onset of the skin lesions, had symptoms such as fatigue, nervousness, fever, headache, gastrointestinal symptoms (diarrhoea or constipation), joint pain, or malaise. The same question was put concurrently to 108 controls matched as to age and sex, selected at random, who had been fit for work and regarded themselves as in full health. The symptoms were recorded as often in the control group as in the pityriasis rosea patients over a period of two weeks (Table 21).

Table 21. Incidence, Type and Distribution of Prodromal Symptoms in 108 Patients with Pityriasis Rosea and 108 Matched Controls.

	108 Patients		108 Controls		Statistical Testing
	No.	Per Cent	No.	Per Cent	
Fatigue	19	17.6	23	21.3	Not Significant
Nervousness	11	10.2	10	9.3	"
Fever [Subjective]	5	4.6	10	9.3	"
Headache	8	7.4	16	14.8	Indicative
Gastrointestinal symptoms	4	3.7	14	13.0	Significant
Joint Pain	2	1.9	4	3.7	Not Significant
Malaise	7	6.5	3	2.8	"
With One or More Symptoms	31	28.7	42	38.9	"

The incidence of the various symptoms was subjected to the Chi-square test one group against the other; this disclosed no statistically proven differences between the groups as regards fatigue, nervousness, joint pain, or malaise. But the incidence of headache was indicatively higher in the controls. Gastrointestinal symptoms were shown with 95 per cent confidence to occur more frequently in the control group. These apparently curious

results might be accounted for by random distribution. The results agree with the view expressed in the literature, mentioned above, that the absence of constitutional symptoms is striking in pityriasis rosea patients as compared with healthy persons.

Information on *fever* collected from both patients and controls in the interviews mentioned above was usually a personal report and not verified by a thermometer. However, rectal temperature was recorded repeatedly in 42 patients hospitalized for pityriasis rosea. The lesions in these cases were generally marked. One of these patients had a slight rise in body temperature on the afternoon of admission, when he had been ambulant. A morning temperature of  $37.2^{\circ}$  C was recorded in one patient on the day following admission, but he was subsequently afebrile. Another patient had fever of  $38.5^{\circ}$  C on the morning following admission, but it returned to normal afterwards. However, this patient also had pronounced acute urticaria, which was the chief reason for his hospitalization; the courses of the two conditions were independent of each other.

To sum up, it may be said that the study afforded no confirmation for the assumption that prodromata such as fatigue, nervousness, fever, headache, gastrointestinal symptoms, joint pain, or malaise occur any more frequently in pityriasis rosea patients than would be expected in a "healthy" population.

## THE SKIN LESIONS OF PITYRIASIS ROSEA

This part of the study was not aimed at fully analysing all the different facets of the dermatologic picture of pityriasis rosea. Instead, we limited our investigation to a few aspects on which our series appeared capable of affording information of value: the situation of the primary plaque, the interval elapsing between the appearance of the plaque and the generalized outbreak, the order in which different regions are involved, the situation of the most advanced lesions, the duration of the disease, the incidence of itching, and subsequent disturbances in pigmentation.

### 1) *Situation of the Primary Plaque*

The primary plaques are usually said to be situated chiefly in areas of the body covered by clothes. The following sites have been named in order of falling incidence: the chest, back, neck, abdomen, extremities (36). The distribution of the primary plaques in different regions (head and neck, arms, trunk, legs) in altogether 552 patients collected from three series in the literature (14, 76, 198) is given in Table 22. In men, the lesions are reported to be most common on the chest and shoulders, in women also on the hips and waist (185). A primary plaque on the face (96, 98, 133, 137, 198, 205) or on the penis (96, 121, 133, 169) is seen in rare instances.

#### *Present Series*

The situation of the primary plaque was recorded in 237 patients, 109 men and 128 women (Fig. 8). On comparing the different sites of the plaque in men and women, no significant difference emerged as regards the sites listed in the figure (Chi-square test).

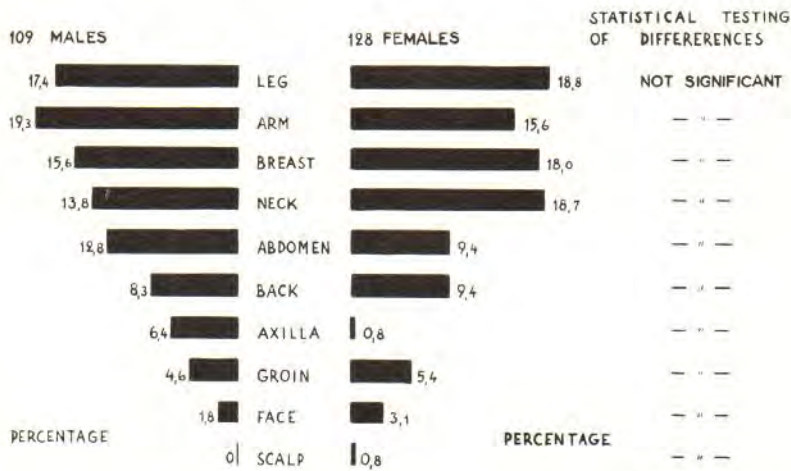


Fig. 8. Localisation of the Primary Lesion in 237 Patients with Pityriasis Rosea.

Comparison of the situation of the primary plaque in our series with corresponding data collected from the literature (shown in Table 22), disclosed significant differences.

(Chi-square testing shows the difference between the series to be significant beyond the .001 level, as the Chi-square value is 34.6 for three degrees of freedom).

Table 22. Situation of the Primary Lesions in 552 Cases of Pityriasis Rosea in Literature and 237 Cases in the Present Series.

Author	No. of Cases	Head Neck	Arm	Trunk	Leg
Highman and Rulison 1923	35	5	8	17	5
Weiss et al. 1927	103	9	22	58	14
Benedek 1935	414	37	93	232	52
Total number	552	51	123	307	71
Per cent	100	9.2	22.3	55.6	12.9
Present series	237	46	41	107	43
Per cent	100	19.4	17.3	45.2	18.1

## 2) Interval between Primary Plaque and Generalized Outbreak

The period elapsing between the appearance of the primary plaque and the generalized outbreak of pityriasis rosea varies within wide limits. Intervals ranging from three hours (216) to several months (64, 185) have been reported. Different authors have stated the usual interval to be: 2 to 14 days (109), 4 to 14 days (120), 7 to 14 days (28), around 10 days (1), and 14 to 21 days (104). Data on the interval in 76 patients collected from two series in the literature (76, 198) are given in Table 23.

Table 23. Interval between the Primary Lesion and the Generalized Eruption in 76 Cases of Pityriasis Rosea in the Literature and 70 Cases in the Present series.

Author	No. of Cases	0—7	8—14	15—21	22—28	29—35	36—42	43—49	84
Weiss et al. 1927	45	31	10	1	0	2	0	1	0
Highman and Rulison 1923	31	6	15	3	0	4	2	0	1
Total number	76	37	25	4	0	6	2	1	1
Present investigation	70	19	24	15	7	3	1	1	

#### *Present Series*

On comparing the interval between the appearance of the primary plaque and the generalized outbreak in 70 of our patients, who believed their information to be reliable (Table 23), with that in 76 patients from two series in the literature, we found the mean interval to be shorter in our series.

The Chi-square value is 19.49 for three degrees of freedom, which is significant at the .001 level. Classes 15 to 21, 22 to 28, and 29 to 35 were grouped together, as also classes 36 to 42 and 43 to 49 because of their small size.

### 3) *Order of Involvement of Different Regions*

#### *Present Series*

Twenty-six patients, 16 women and 10 men, all with marked and extensive lesions, had observed their "pathways of spread" so carefully that their information was used as a basis for analysis. The most common "pathway of spread" in generalized pityriasis rosea was chest — abdomen — arms — back — thighs — neck. The most frequent site of the primary lesion in the 26 patients examined was, then, the chest (Table 24).

The site of onset of the skin lesions, usually the primary plaque, was ranked as 1, the following site as 2, and the region last involved was ranked as 6. This gave a rank number between 1 and 6 for each of the six sites in each patient. When the pityriasis rosea changes appeared simultaneously in two different sites, these were given the same number and consideration was given to this ranking in the statistical tests. The sum of 26 rank numbers for each site was calculated, giving 6 so-called sums of the ranks. Obviously, a low rank sum implied a large amount of low rank numbers for this site, meaning that the skin changes had reached the relevant region early. Conversely, a high sum of the ranks inferred a larger amount of high rank numbers and comparatively late spread to that site.

In order to ascertain whether any statistically proven connexion existed between the different sums of the ranks, Kendall's concordance coefficient test was used. This showed the difference between the sums of the ranks to be significant with 99.9 per cent confidence.

### 4) *Situation of the Most Advanced Lesions*

#### *Present Series*

In 80 patients, 44 men and 36 women, the site of the most advanced pityriasis rosea changes was observed with such care that the data could serve for analysis (Fig. 9).

Table 24. Ranks Assigned to the Involvement of Various Cutaneous Areas in 26 Patients with Pityriasis Rosea.

Date of Birth	Sex	Neck	Breast	Back	Arms	Abdomen	Thighs
14 08 08	F	3	2	2	4	1	5
16 11 16	F	3	4	4	1	4	2
16 12 16	M	5	2	4	1	3	4
17 11 12	M	2	1	2	3	2	4
19 04 25	M	4	2	5	3	1	6
20 03 22	F	2	1	3	3	4	5
21 12 12	F	4	3	3	3	2	1
23 12 11	F	2	3	6	1	4	5
25 03 13	M	6	4	5	3	2	1
30 09 07	M	5	2	4	3	1	5
30 09 20	F	5	3	4	1	2	6
32 08 30	F	6	2	3	4	1	5
34 01 26	M	3	2	6	1	4	5
36 08 05	M	3	2	3	2	1	3
37 07 21	F	6	2	3	4	1	5
39 05 16	F	6	1	2	3	4	5
40 11 20	F	2	3	6	5	4	1
41 01 28	F	3	1	2	6	4	5
42 05 16	F	5	2	6	4	3	1
43 06 02	F	6	1	3	5	2	4
45 08 06	F	1	2	2	3	3	2
47 08 04	M	3	4	5	2	1	6
49 04 07	M	6	1	3	4	2	5
50 02 13	M	5	4	2	1	3	6
51 05 26	F	6	4	1	5	3	2
51 10 03	F	6	2	1	4	3	5
		108	60	90	79	65	104

The Kendall coefficient of concordance  $W = 0.167$ .  
 $W$  is significant at the .01 level.

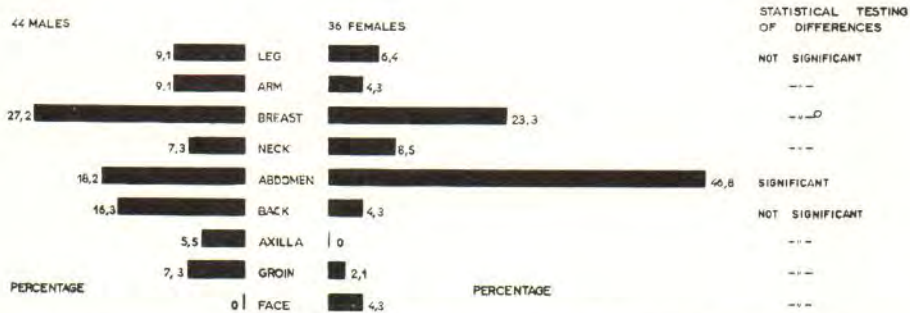


Fig. 9. Localization of the Most Pronounced Lesions in 80 Patients with Pityriasis Rosea.

Comparison of men and women showed the latter to have the most advanced skin lesions on the abdomen in a statistically significantly higher degree than the mean (Chi-square test).

### 5) Duration

Pityriasis rosea of very short duration has been reported (76, 109, 196), but also running a course of months and years (42, 81, 99, 109, 120, 158, 182). The usual duration of the disease is stated by different authors to range from 2 to 12 weeks: 2 to 4 weeks (76), 4 to 6 weeks (119), 4 to 6 weeks (36), 4 to 10 weeks (41), 5 to 8 weeks (1), 5 to 10 weeks (183), 6 to 8 weeks (59, 79, 150, 182), and 6 to 12 weeks (120). Its mean duration has also been reported as shorter, approximately 10 days (196).

#### *Present Series*

Reliable information on the duration of the disease was thought to be available in 61 patients (Table 25). This was three weeks or less in 26 patients (43 per cent), six weeks or less in 51 patients (84 per cent), and exceeded eight weeks in only one patient. In this latter instance, the pityriasis rosea probably derived from gold medication. As mentioned in the forgoing, when provoked by medication, the course of pityriasis rosea is characteristically long.

Table 25. Duration of Pityriasis Rosea in 61 Patients.

Time in Weeks	1	2	3	4	5	6	7	8	9	10	11	12
Number of Patients	2	9	15	11	8	6	5	4				1

### 6) Itching

Itching is generally said to occur in between half and one fourth of pityriasis rosea patients. However, data vary considerably: itching was wholly absent in the majority of the patients in one series, and was never a predominant symptom (186), while in another it occurred in almost every patient (197). Severe itching was reported in 48, and moderate itching in 54 of 380 patients (198), and in another series of 270 patients itching was recorded in 90 (196).

#### *Present Series*

Information on the occurrence and intensity of itching was available for 274 patients (Table 26). It was, then, wholly absent in 61 patients, while in 50 it was so severe that it disturbed the patient's sleep. Itching in the remaining instances was slight or moderate.

Table 26. Intensity of Itching in 274 Patients with Pityriasis Rosea

Intensity of Itching	None	Slight	Moderate	Severe
Number of Patients	61	64	99	50



## 7) Disturbances in Pigmentation

The hyperpigmentation resulting from exposure to the sun has been reported to afford *local protection* against pityriasis rosea lesions (33, 54). However, it has also been said that sunburn offers no protection whatever (95), or only in occasional cases (92). The view has also been expressed that the lesions tend to be concentrated within tanned areas (54). *Ultra-violet rays* have given favourable results in the treatment of pityriasis rosea (36, 72, 73, 124, 166, 194), but it has also failed to produce any noteworthy effect (16, 95).

Earlier *roentgen radiation* of the skin has also been said to prevent the appearance of pityriasis rosea eruptions in the irradiated area (33). This radiation has also been used therapeutically (73, 90, 212).

Disturbances in pigmentation, hyper- or hypopigmentation, occur in skin areas which have been the seat of pityriasis rosea lesions. Disturbances of this type have been regarded as rare (120, 182).

A. *Hyperpigmentation* (18, 89, 120, 162, 216, 217) occurred in only one of 174 patients (109). As mentioned earlier, intense hyperpigmentation often occurs in the forms of pityriasis rosea precipitated by medication (132). It has been seen following treatment with ultraviolet rays, which prompted a warning against this therapy for pityriasis rosea (16). The view has also been expressed that increased pigmentation might result from local therapy (132, 214). A connexion between hyperpigmentation in pityriasis rosea and hypophysial activity has been discussed (18).

B. *Hypopigmentation* (3, 125, 152, 177, 191, 213) after pityriasis rosea occurred in three of 350 patients (99).

*Present Series*

The present series permits no conclusions as to the local protection against the appearance of pityriasis rosea eruptions afforded by *prior* pigmentation. Treatment with ultraviolet rays or roentgen radiation was not used.

Roughly one third of 108 patients observed disturbances in pigmentation *during the late course* (Table 27) of pityriasis rosea, increases and decreases in pigmentation being reported in about an equal number of instances. The most pronounced hyperpigmentation supervened in a case in which the disease had probably been provoked by gold medication. Local treatment throughout the series consisted in the application of indifferent agents, chiefly zinc oxide preparations. The relation between the distribution of the changes in pigmentation and skin areas earlier exposed to the sun could not be evaluated sufficiently reliably in our series.

Table 27. Disturbances of Pigmentation Secondary to Pityriasis Rosea in 108 Patients.

Disturbances of Pigmentation	Hyperpigmentation	Hypopigmentation
Number of Patients	14	18

## RECURRENCES

In pityriasis rosea, recurrences are usually taken to denote new outbreaks of the disease after an interval of several months, while outbreaks after a shorter interval are instead regarded as exacerbations. Most recurrences occur after a year or so, but may be delayed for 30 years. The literature records recurrences in the following incidences: 1 in 202 cases (186), 2 in 156 cases (57), 1 in 80 (13), 2 in 270 (196), 1 in 119 (182), 1 in 85 (61), none in 46 (98), none in 174 (109), and 3 in 350 (99). In other words, altogether 16 recurrences were noted in 1,862 cases.

As a rule, a *single recurrence* has been recorded (13, 19, 42, 45, 57, 62, 68, 76, 94, 100, 110, 120, 122, 132, 145, 166, 182, 185, 196, 198, 199, 202), and in a few instances *two recurrences* (43, 72, 76, 103, 146). Three of the above recurrences were observed in physicians (42, 72, 122). Outbreaks of pityriasis rosea were noted in one woman in the same month of two consecutive pregnancies (171). In one patient who had three outbreaks of the skin disease, the last was the least severe (43), and in another with three outbreaks the last two were mildest (103). The primary plaque of the recurrences was usually in a different site, but in a few instances appeared in the same situation as the initial plaque (42).

*Present Series*

Six recurrences were diagnosed by physicians and regarded as definite in the present series. In addition, there were seven cases of probable recurrence. In these latter cases, the initial diagnosis was made by a physician, while the second outbreak was observed by the patients themselves. The patients' reports list features so characteristic of pityriasis rosea that the diagnosis can be regarded as probable. Three of the definite, and six probable, recurrences were recorded in 108 patients investigated in closer detail as to fresh outbreaks of the disease. Data on the remaining 718 patients were collected from hospital records which, however, contained no regular observations on recurrences.

Table 28. Recurrence of Pityriasis Rosea in 13 Cases in the Present Series.

Case no.	Time between the outbreaks	Primary lesions at same or different sites
1	4 months	different
2	6 "	"
3	1 year	"
4	1 "	"
5	1 "	same?
6	1 "	?
7	2 years	same
8	3 "	different
9	4 "	?
10	9 "	?
11	{ 11 "	different
	{ 6 months	"
12	30 years	"
13	2 "	"

The recurrence was single in all but one patient (Table 28); the exception was a young woman in whom two new outbreaks occurred, all three diagnoses were made by a dermatologist. The interval between the outbreaks of the disease ranged from four months to thirty years. In two instances, the primary plaque recurred in the same situation, in eight the second primary plaque was in another site, while in four cases information was incomplete.

In the present study, then, the proven incidence of recurrences was 3:108 (2.8 per cent). If this is compared with the corresponding figure in the literature, 16:1, 826 (0.9 per cent), the incidence is seen to be significantly higher in our series (Chi-square test).

It may be presumed that patients who have consulted their physician for pityriasis rosea and been told of the harmless nature and spontaneous healing of the condition, will await the subsidence of a fresh outbreak without again taking medical advice. The true incidence of recurrences may, therefore, well be higher than that arrived at on investigation of a pityriasis rosea series.

## OCCUPATION

### *Present Series*

The distribution of occupations in the pityriasis rosea patients over the age of 15 years, when known, was compared with the corresponding distribution in the population of the city of Gothenburg as it was in 1950 (Table 29). The occupations taken into consideration were selected by excluding those in which information regarding the patients was incomplete. Five representative occupational groups were chosen for testing: workers in the metal industry, wood and paper industries, textile and clothing industries, health services, and housewives. Analysis revealed no significant predominance of pityriasis rosea patients in any of these occupational groups. The greater part of the Chi-square value derives from the high incidence of pityriasis rosea cases in the health services (Table 30). The reason for the predominance in this group (although not significant) may be due to the greater readiness of this category to take medical advice.

## LABORATORY TESTS

### *Present Series*

Laboratory tests were performed in some 50 pityriasis rosea patients and 50 healthy controls matched as to age and sex. These included: haemoglobin, numbers of red and white blood cells, white blood picture, number of thrombocytes, clotting time, bleeding time, prothrombin index, serum protein, erythrocyte sedimentation rate, icterus index, and blood pressure.

All the laboratory tests were carried out at the routine laboratory of the hospital. Tests intended for routine clinical use do not, of course, aim at exact mathematical values. The *measurement errors* which occur in laboratory tests are due to several factors such as changes in the composition of the chemical agents used, incomplete mixing in pipettes, mechanical faults, errors of measurement or reading. Such errors may in some instances be magnified, in that calculations are made on a small fragment of the sample and subsequently multiplied by a constant. In the present study, this applies to counts of red and

Table 29. Distribution of Occupations in 356 Pityriasis Rosea Patients and in the Population of Gothenburg.

Occupation	Working population of Gothenburg (both sexes, over 15 years)	Pityriasis Rosea Patients (both sexes, over 15 years)
<i>Industry and crafts</i>		
Metal	29,197	61
Wood and paper	2,634	7
Printing	3,152	2
Foodstuffs and tobacco	6,778	2
Textiles and clothing	12,326	26
Leather, hair, and rubber goods	1,940	3
Chemical and technical articles	2,314	7
<i>Transport</i>		
Land	8,759	17
Sea	7,174	13
Post and telegraph	3,675	4
Others	3,536	6
<i>Commerce</i>		
Wholesale:		
foodstuffs, etc.	2,819	6
machines, tolls, etc.	1,881	2
Detail:		
foodstuffs, etc.	5,909	4
textiles and clothing	4,148	1
Banks and insurance	2,426	2
Agencies and advertising	2,104	3
Real estate	1,396	1
Hotels and restaurants	5,536	16
<i>Public Offices</i>		
Armed services	2,101	3
Health services	7,231	25
<i>Housewives</i>	65,935	129

Table 30. Incidence of Pityriasis Rosea in Some Selected Occupations in Gothenburg.

Branch	No. of persons employed in Gothenburg	No. of patients with pityriasis rosea
Metal industry	29,197	61
Wood and paper industries	2,634	7
Textile and clothing industries	12,326	26
Health services	7,231	25
Housewives	65,935	129

The Chi-square value is 7.3 for four degrees of freedom. Not significant.

white blood cells and thrombocytes. Measurement errors may also be magnified if the laboratory tests are carried out by different examiners. All the tests reported here were done by the same laboratory personnel.

Values consistently too low or consistently too high are one type of *error of bias* which may occur. However, in the present study the pityriasis rosea patients and matched controls were compared continuously. This precludes any effect of this type of error of bias. No determination of this error of bias was made, but since the laboratory personnel has wide experience of these tests, such errors are not to be expected.

On statistical testing with parametric methods, the measurement error is added to the random sampling variance. If the measurement error is large, the difference between two means tested must be very big if significant differences between mean values are to be demonstrable. The significance test will, of course, be unreliable if a difference is less than the measurement error. More accurate laboratory methods subject to smaller measurement errors might be capable of disclosing significant differences where the present unreliable methods fail to demonstrate differences. In order to reduce the error of measurement in our studies, it would have been desirable to duplicate *every* laboratory test and use the mean of two determinations. However, this was not practicable.

Instead, *measurement errors were determined* — although only for the numbers of white blood cells and the haemoglobin level. Duplicate determinations were carried out in 17 patients. As all factors responsible for random error must be given an opportunity to contribute to estimate, the whole procedure (different punctures and the like) is included in each duplicate. By using the significance test, it was found that there was no tendency for the second test of the pair to be either predominantly greater or smaller than the first. Nor was there any correlation between the total number of white blood cells and the size of the difference between the two counts. The standard error of observation was  $\pm 637$  for white blood cells, and  $\pm 1.04$  for the haemoglobin value. As would be expected, the greatest inaccuracy attaches to blood counting with a small number of counted cells and a large multiplication constant, while the inaccuracy of the chemical and physical determinations may be assumed to be fairly slight.

#### *Statistical Tests*

It is only in parametric tests that consideration can be given in the calculations to measurement errors. In addition to the parametric test used in the present study (Student's F-test), we also used *non-parametric* tests (the Sign test, the Wilcoxon Matched-Pairs Signed-Ranks Test, and the Chi-square test). Certainly, parametric tests are stronger than non-parametric, but they make greater demands on the population in that the distribution must be normal if significant differences are to be demonstrable. Even if in the present study it was to be supposed that the population was of normal distribution, in the interests of accuracy both parametric and non-parametric tests were used in all the investigations (except the icterus index). Since the non-parametric test has only 90 per cent of the parametric test's strength, it happens in populations of normal distribution that Student's test gives a significant result, while the weaker non-parametric tests are only indicative or non-significant.

The significance level in the present study was  $=.05$ .

#### *Haemoglobin*

No significant difference was demonstrable between the haemoglobin levels in the pityriasis rosea patients and the controls (Table 31).

Ljungberg's method of haemoglobin determination was used.

20 mm<sup>3</sup> of capillary blood are mixed with 5 ml of 0.1 % sodium carbonate solution and readings taken on Ljungberg's apparatus. The result is expressed in per cent. The apparatus was standardized according to the so-called German standard, 100 % = 16 g % = 21.4 vol % O<sub>2</sub>.

The arithmetic mean in 48 pityriasis rosea patients was 86.1, variance 53.2, and the mean in 48 matched controls was 86.4, variance 93.6. Difference 0.30. Student's F-test showed significantly

Table 31. Laboratory Tests (Hemoglobin, Red Cells, Sedimentation Rate, Platelets, Bleeding Time, Coagulation Time, Prothrombin) Recorded for about 50 Patients with Pityriasis Rosea and an Equal Number of Matched Controls.

	Pityriasis Rosea	Controls	Differences of Means	Statistical Testing	
Haemoglobin	$\bar{x}=86.1$ $s^2=53.2$ N=48	$\bar{x}=86.4$ $s^2=93.6$ N=48	-0.3	T-Test Sign-Test Wilcoxon's Test	Not Significant " "
Red-Cells	$\bar{x}=4.27$ $s^2=0.15$ N=49	$\bar{x}=4.43$ $s^2=0.19$ N=49	-0.16	T-Test Sign-Test Wilcoxon's Test	Significant Indicative Significant
Sedimentation Rate	$\bar{x}=8.1$ $s^2=48.6$ N=47	$\bar{x}=6.7$ $s^2=21.0$ N=47	1.4	T-Test Sign-Test Wilcoxon's Test	Not Significant Indicative "
Platelets	$\bar{x}=225674$ $s^2=2088 \cdot 10^6$ N=46	$\bar{x}=236522$ $s^2=2123 \cdot 10^6$ N=46	10848	T-Test Sign-Test Wilcoxon's Test	Not Significant Indicative "
Bleeding Time	$\bar{x}=2.53$ $s^2=1.49$ N=48	$\bar{x}=3.14$ $s^2=3.47$ N=48	-0.61	T-Test Sign-Test Wilcoxon's Test	Significant Indicative "
Clotting Time	$\bar{x}=4.42$ $s^2=2.65$ N=50	$\bar{x}=4.64$ $s^2=5.68$ N=50	-0.22	T-Test Sign-Test Wilcoxon's Test	(Significant) Not Significant "
Prothrombin	$\bar{x}=97.8$ $s^2=126.1$ N=49	$\bar{x}=97.8$ $s^2=99.7$ N=49	0	T-Test Sign-Test Wilcoxon's Test	Not Significant " "

$\bar{x}$ =Average

$s^2$ =Variance

Significance Level:

$\alpha=.05$

higher variance in the controls, and a computation of the degrees of freedom was done. T-test not significant. Sign-test not significant (20+, 24-). Wilcoxon's test not significant.

### Red Blood Count

The pityriasis rosea patients had (within normal limits) significantly lower red cell counts than the controls (Table 31).

The determinations were done with Ellermann's method.

10 mm<sup>3</sup> of capillary blood are mixed with 1,990 mm<sup>3</sup> of Hayem's solution according to Jørgensen's modification and counted in a solution of 1:200 in Bürker's counting chamber. Sixteen so-called CB-fields containing 1/800 mm<sup>3</sup> are counted and the result multiplied by 10,000, after which the total number is obtained.

The arithmetic mean in 49 pityriasis rosea patients was 4.27, variance 0.15, and the mean in 49 controls was 4.43, variance 0.19. Difference 0.16. Homogeneous variances. T-test significant and sign-test indicative (19+, 28-). Wilcoxon's test significant.

Table 32. White-Cell and Differential Counts (Cells per Cu.mm.) Recorded for about 50 Patients with Pityriasis Rosea and an Equal Number of Matched Controls.

	Pityriasis Rosea	Controls	Differences of Means	Statistical Testing	
White-Cells	$\bar{x}=6042$ $s^2=2743300$ $N=50$	$\bar{x}=6514$ $s^2=5232248$ $N=50$	-472	T-Test Sign-Test Wilcoxon's Test	Not Significant " "
Neutrophils Juvenile	$\bar{x}=154.0$ $s^2=33013$ $N=43$	$\bar{x}=103.6$ $s^2=8301$ $N=43$	50.4	T-Test Sign-Test Wilcoxon's Test	Significant Not Significant "
Neutrophils Adults	$\bar{x}=3440$ $s^2=1968140$ $N=48$	$\bar{x}=4012$ $s^2=4217509$ $N=48$	-572	T-Test Sign-Test Wilcoxon's Test	Indicative " Significant
Eosinophils	$\bar{x}=169.1$ $s^2=26369$ $N=47$	$\bar{x}=168.2$ $s^2=29997$ $N=47$	0.9	T-Test Sign-Test Wilcoxon's Test	Not Significant " "
Monocytes	$\bar{x}=291.5$ $s^2=37801$ $N=45$	$\bar{x}=262.7$ $s^2=24670$ $N=45$	28.8	T-Test Sign-Test Wilcoxon's Test	Not Significant Significant Not Significant
Lymphocytes	$\bar{x}=1983.4$ $s^2=291246$ $N=47$	$\bar{x}=2012.2$ $s^2=343319$ $N=47$	-28.8	T-Test Sign-Test Wilcoxon's Test	Not Significant " "

$\bar{x}$  = Average

$s^2$  = Variance

$N$  = Number

Significance Level:

$\alpha = .05$

#### White Blood Count

No significant difference between pityriasis rosea patients and controls emerged as regards the total number of white blood cells (Table 32).

Ellermann's method was used.

25 mm<sup>3</sup> of capillary blood is mixed with 475 mm<sup>3</sup> of Türk's reagent and counted in a dilution of 1:20 in Bürker's counting chamber. Thirty-two so-called B-fields are counted, each containing 1/160 mm<sup>3</sup>. The result is multiplied by 1,000, after which the total number is obtained.

The arithmetic mean in 50 pityriasis rosea patients was 6,042, variance 2,743,300, and the mean in 50 controls was 6,514, variance 5,232,248. Difference 472. The variance was significantly higher in the controls. Measurement error, see above. T-test not significant, Sign-test not significant (21+, 29-). Wilcoxon's test not significant.

#### White Blood Picture

No major systematic study on the blood changes of pityriasis rosea appears to have been published earlier. The data on the changes in the literature are contradictory. Both normal findings (36, 81, 120, 207) and pathologic changes in the white blood picture

have been reported: eosinophilia, lymphocytosis, increase in the number of mast cells (5 patients examined) (186); eosinophilia and leucocytosis (149); eosinophilia (129); eosinophilia and leucocytosis (128); eosinophilia in nine and lymphocytosis in eight of twenty-eight patients examined (61); eosinophilia and lymphocytosis (143); lymphocytosis with a tendency to leucopenia (185). In contrast to the above reports of eosinophilia in pityriasis rosea, the number of eosinophilic leucocytes has been said to be reduced (156). It has also been emphasised that the reduction in eosinophilic leucocytes is of such regular incidence in pityriasis rosea that the finding could serve to differentiate the condition from trichophytid, which is usually accompanied by eosinophilia (20).

#### *Present Series*

Smears of blood were stained with May-Grünwald's solution and then with Giemsa solution. Counting was done in 1,250 magnification. 100 cells were counted and assigned to different cell types. Areas of suitable thickness were selected for examination, which was done from edge to edge of the plate at an angle of 90 degrees to the smear's long axis.

#### *Juvenile Neutrophilic Leucocytes*

The pityriasis rosea patients had (within normal limits) significantly higher numbers of juvenile leucocytes than the controls (Table 32).

The arithmetic mean in 43 pityriasis rosea patients was 154.0, variance 33,013, and the mean in 43 controls was 103.6, variance 8,301. Difference 50.4. The variances were not homogeneous. T-test significant. Sign-test not significant (18—, 23+).

#### *Adult Neutrophilic Leucocytes*

The pityriasis rosea patients had (within normal limits) a significantly lower number of adult neutrophilic leucocytes than the controls (Table 32).

The arithmetic mean in 48 pityriasis rosea patients was 3,440, variance 1,968,140, and the mean in 48 controls was 4,012, variance 4,217,509. Difference 572. The controls had a significantly higher variance. T-test indicative. Sign-test indicative (19+, 29—). Wilcoxon's test significant.

#### *Eosinophilic Leucocytes*

There was no significant difference between pityriasis rosea patients and the controls as regards the number of eosinophilic leucocytes (Table 32).

The arithmetic mean in 47 pityriasis rosea patients was 169.1, variance 26,369, and the mean in 47 controls was 168.2, variance 29,997. Difference 0.9. The variances were homogeneous. T-test not significant. Sign-test not significant (21—, 26+). Wilcoxon's test not significant.

#### *Monocytes*

The pityriasis rosea patients had (within normal limits) a significantly higher number of monocytes than the controls (Table 32).

The arithmetic mean in 45 pityriasis rosea patients was 291.5, variance 37,801, and the mean in 45 controls was 262.7, variance 24,670. Difference 28.8. The variances were homogeneous. T-test not significant. Sign-test significant (27+, 18—). Wilcoxon's test not significant.



### *Lymphocytes*

There was no significant difference between the pityriasis rosea patients and the controls as regards the number of lymphocytes (Table 32).

The arithmetic mean in 47 pityriasis rosea patients was 1983.4, variance 291,246, and the mean in 47 controls was 2012.2, variance 343,319. Difference 28.8. The variances were homogeneous. T-test not significant. Sign-test not significant (23+, 24-). Wilcoxon's test not significant.

### *Platelets*

The pityriasis rosea patients had (within normal limits) an indicatively lower number of platelets than the controls (Table 31).

According to Kristensson's method, Ellermann's modification. 25 mm<sup>3</sup> of blood is mixed with 475 mm<sup>3</sup> of diluting fluid and counted in a dilution of 1:20 in Bürker's counting chamber after 30 minutes' sedimentation. Sixteen so-called CD-fields are counted, containing 1/800 mm<sup>3</sup>. The result is multiplied by 1,000, after which the total is obtained.

The arithmetic mean in 46 pityriasis rosea patients was 225,674, variance 2088.10<sup>6</sup>, and the mean in 46 controls was 236,522, variance 2123 · 10<sup>6</sup>. Difference 10,848. The variances were homogeneous. T-test not significant. Sign-test indicative (25-, 17+). Wilcoxon's test indicative.

### *Bleeding Time*

The pityriasis rosea patients had (within normal limits) a significantly shorter bleeding time than the controls (Table 31).

The bleeding time was determined after a stab incision in the skin.

The arithmetic mean in 48 pityriasis rosea patients was 2.53, variance 1.49, and the mean in 48 controls was 3.14, variance 3.47. Difference 0.61. The controls had a significantly higher variance. T-test significant. Sign-test indicative (18+, 26-). Wilcoxon's test indicative.

### *Clotting Time*

No significant difference was found between the pityriasis rosea patients and the controls as regards the clotting time (Table 31).

Determination with the capillary-tube method, normal value 5 to 10 minutes.

The arithmetic mean in 50 pityriasis rosea patients was 4.42, variance 2.65, and the mean in 50 controls was 4.64, variance 5.68. Difference 0.22. The controls had a significantly higher variance. T-test significant. Sign-test not significant (22-, 21+). Wilcoxon's test not significant.

### *Prothrombin Index*

No significant difference was found between the pityriasis rosea patients and the controls as regards the prothrombin index (Table 31).

Determination with Owren's method.

The arithmetic mean in 49 pityriasis rosea patients was 97.8, variance 126.1, and the mean in 49 controls was 97.8, variance 99.7. Difference 0. The variances were homogeneous. T-test not significant. Sign-test not significant (27+, 18-). Wilcoxon's test not significant.

Table 33. Paper Electrophoresis of Serum Proteins in Patients with Pityriasis Rosca and Matched Controls.

	Pityriasis Rosca	Controls	Difference	Statistical Testing	
Total Serum Protein	$\bar{x} = 7.1$ $s^2 = 0.060$ $N = 25$	$\bar{x} = 6.9$ $s^2 = 0.096$ $N = 25$	0.2	T-Test Sign-Test Wilcoxon's Test	Significant " "
Albumin	$\bar{x} = 4.024$ $s^2 = 0.149$ $N = 25$	$\bar{x} = 3.936$ $s^2 = 0.086$ $N = 25$	0.088	T-Test Sign-Test Wilcoxon's Test	Not Significant Significant Indicative
Alpha 1 Globulin	$\bar{x} = 0.43$ $s^2 = 0.0052$ $N = 24$	$\bar{x} = 0.38$ $s^2 = 0.0068$ $N = 24$	0.05	T-Test Sign-Test Wilcoxon's Test	Significant " Indicative
Alpha 2 Globulin	$\bar{x} = 0.51$ $s^2 = 0.096$ $N = 24$	$\bar{x} = 0.52$ $s^2 = 0.030$ $N = 24$	0.01	T-Test Sign-Test Wilcoxon's Test	Not Significant " "
Beta Globulin	$\bar{x} = 0.83$ $s^2 = 0.01$ $N = 24$	$\bar{x} = 0.80$ $s^2 = 0.02$ $N = 24$	0.03	T-Test Sing-Test Wilcoxon's Test	Not Significant " "
Gamma Globulin	$\bar{x} = 1.30$ $s^2 = 0.0517$ $N = 25$	$\bar{x} = 1.26$ $s^2 = 0.0350$ $N = 25$	0.04	T-Test Sign-Test Wilcoxon's Test	Not Significant " "

 $\bar{x}$  = Average $s^2$  = Variance

N = Number

Significance Level:

 $\alpha = .05$ 

### *Sedimentation Rate*

The pityriasis rosca patients had an indicatively higher sedimentation rate than the controls.

Westergren's method. Normal value in men 4 to 7 mm in one hour, in women 8 to 11 mm in one hour (Table 31).

The arithmetic mean in 47 pityriasis rosca patients was 8.1, variance 48.6, and the mean in 47 controls was 6.7, variance 21.0. Difference 1.4. Significantly higher variance in the pityriasis rosca patients. T-test not significant. Sign-test indicative (24+, 16—). Wilcoxon's test indicative.

### *Total Serum Protein*

The pityriasis rosca patients had (within normal limits) a significantly higher total serum protein level than the controls (Table 33).

Total protein was determined with van Slyke's copper sulphate method.

The arithmetic mean in 25 pityriasis rosca patients was 7.1, variance 0.060, and the mean in 25 controls was 6.9, variance 0.096. Difference 0.2. The variances were homogeneous. T-test significant. Sign-test significant (18+, 7—). Wilcoxon's test significant.

### *Protein Fractions*

Determined with paper electrophoresis.

Normal values in grammes per cent: Albumin 3.5 to 4.9, alpha<sub>1</sub> globulin 0.2 to 0.4, alpha<sub>2</sub> globulin 0.3 to 0.6, beta globulin 0.6 to 1.0, gamma globulin 0.9 to 1.9.

#### *Albumin*

The pityriasis rosea patients had (within normal limits) a significantly higher albumin value than the controls (Table 33).

The arithmetic mean in 25 pityriasis rosea patients was 4.024, variance 0.149, and the mean in 25 controls was 3.936, variance 0.086. Difference 0.088. The variances were homogeneous. T-test not significant. Sign-test significant (17+, 7-). Wilcoxon's test indicative.

#### *Alpha<sub>1</sub> Globulin*

The pityriasis rosea patients had (within normal limits) a significantly higher alpha<sub>1</sub> globulin value than the controls (Table 33).

The arithmetic mean in 24 pityriasis rosea patients was 0.43, variance 0.0052, and the mean in 24 controls was 0.38, variance 0.0068. Difference 0.05. The variances were homogeneous. T-test significant. Sign-test significant (13+, 4-). Wilcoxon's test indicative.

#### *Alpha<sub>2</sub> Globulin*

No significant difference emerged between the pityriasis rosea patients and controls as regards alpha<sub>2</sub> globulin (Table 33).

The arithmetic mean in 24 pityriasis rosea patients was 0.51, variance 0.096, and the mean in 24 controls was 0.52, variance 0.030. Difference 0.01. The pityriasis rosea patients had a significantly higher variance. T-test not significant. Sign-test not significant (7-, 4+). Wilcoxon's test not significant.

#### *Beta Globulin*

No significant difference emerged between the pityriasis rosea patients and controls as regards beta globulin (Table 33).

The arithmetic mean in 24 pityriasis rosea patients was 0.83, variance 0.01, and the mean in 24 controls was 0.80, variance 0.02. Difference 0.03. Homogeneous variances. T-test not significant. Sign-test not significant (9+, 9-). Wilcoxon's test not significant.

#### *Gamma Globulin*

No significant difference emerged between the pityriasis rosea patients and controls as regards gamma globulin (Table 33).

The arithmetic mean in 25 pityriasis rosea patients was 1.30, variance 0.0517, and the mean in 25 controls was 1.26, variance 0.0350. Difference 0.04. Variances homogeneous. T-test not significant. Sign-test not significant (11+, 7-). Wilcoxon's test not significant.

*Icterus Index*

Jaundice in pityriasis rosea has been described earlier (109). In the present series, no significant difference emerged between the pityriasis rosea patients and controls as regards the icterus index (Table 34).

Determination according to Meulengracht. Normal values below 7. Chi-square value = 2.63 for one degree of freedom. Not significant.

Table 34. Icterus Index Recorded in 52 Patients with Pityriasis Rosea and 52 Matched Controls.

	Patients with Pityriasis Rosea	Controls
< 4.5	29	36
> 4.5	23	16

Chi-2=2.6 for 1 degree of freedom.

*Blood Pressure*

Hypertension was earlier demonstrated in three of 30 patients (63). In the present series, the pityriasis rosea patients had (within normal limits) a significantly higher value than the controls as regards blood pressure (Table 35).

The patients were examined in the sitting position, and readings were taken after a few minutes' rest. Only systolic pressure was measured (digitally). The same blood pressure apparatus was used for both patients and controls.

The arithmetic mean in 21 pityriasis rosea patients was 126.7, variance 96.6, and the mean in 21 controls was 119.1, variance 61.9. Difference 7.6. Variances homogeneous. T-test significant. Sign-test significant (14+, 4-).

Table 35. Blood Pressure Recorded for 21 Patients with Pityriasis Rosea and an Equal Number of Matched Controls.

	Pityriasis Rosea	Controls	Differences of Means	Statistical Testing
Blood Pressure	$\bar{x} = 126.7$ $s^2 = 96.6$ N = 21	$\bar{x} = 119.1$ $s^2 = 61.9$ N = 21	7.6	T-Test: Significant Sign Test: "

$\bar{x}$  = Average

$s^2$  = Variance

N = Number

Significance Level:

$\alpha = .05$

*Comments on the Laboratory Findings*

The results of the various laboratory tests in the pityriasis rosea patients were generally within the limits stated to be normal for each method. In some instances statistically proven differences were demonstrable between these patients and a matched "healthy"

control group, although values accepted as pathologic for the method concerned were not recorded. These significant differences may represent morbid processes which are, however, not so "far-reaching" as to give rise to what are accepted as "pathologic" laboratory values. The shift to the left in the white blood picture, for instance, might be taken as suggestive of an infectious and/or allergic causation, as might also the slight rise in erythrocyte sedimentation rate and the changes in serum protein. Other differences demonstrated, such as the decrease in the number of red blood cells, the increase in the number of monocytes, the decrease in the number of thrombocytes, and the shortening of the clotting time, may possibly also be accounted for by such aetiological factors.

The rise in blood pressure in the pityriasis rosea patients may have been due to nervous tension at the time of the examination.

However, the 5 per cent risk that the differences demonstrated are due to chance should be borne in mind.

### SUMMARY

The *series* comprised 826 patients with pityriasis rosea treated at the Department of Dermatology in Gothenburg during the period 1949 to 1959. Comparative studies between these patients and apparently healthy controls matched as to age and sex were carried out in some instances.

1. The *incidence* of pityriasis rosea patients at the hospital was largely the same from year to year during the 11-year period.

2. The *sex distribution* showed a roughly equal number of men and women.

3. The *age distribution* showed a predominance of patients aged between 10 and 34 years. This applied to both sexes and was found to be a true predominance and not the result of any special age distribution in the population served by the hospital.

4. *Seasonal variations* were demonstrable, a statistically proven lower incidence of cases during the summer months and at the change of the years being noted. The seasonal variations were found not to be the result of any change in the total attendances for skin diseases at the hospital during different periods of the year. The seasonal curves for the incidence of pityriasis rosea showed gradual changes brought about by successive, slow rises or falls in incidence.

5. The occurrence of a few cases within the same intimate environment is not to be regarded as rare.

6. The *relatives* of patients with pityriasis rosea were found to include a statistically significantly higher number of persons with asthma and eczema than those of the controls.

7. Of earlier diseases, cutaneous infections and eczema were found to have occurred in a statistically proven higher incidence in the pityriasis rosea patients than in the controls. No differences between the two groups were demonstrable as regards a further 40 diseases analysed.

8. Factors earlier believed to *precipitate or cause* *pityriasis rosea* were investigated, the patients being compared with a "healthy" matched control series. These factors included:

- a) *seborrhoea* of the scalp and *Pityrosporum ovale* in the scalp;
- b) new or damp *garments*;

- c) *mental traumata* and prior severe *mental disorder*;
- d) preceding *infections* (tonsillitis, common cold, sinusitis, dental infection, cutaneous infection);

None of these factors occurred in any statistically proven higher incidence in the pityriasis rosea patients than in the controls;

- e) *pregnancy* was not recorded in any significantly higher incidence in the pityriasis rosea patients than in patients with other skin diseases;
- f) *medication* may have precipitated the disease in one of 108 cases (gold);

Observations of pityriasis rosea-like conditions developing during medication with methopromazine preparations are reported;

- g) *vaccinations* were in the present series not found to be connected with the outbreak of pityriasis rosea.

9. *Prodromal symptoms* such as fatigue, fever, nervousness, headache, gastrointestinal symptoms, joint pain, and malaise did not occur more frequently among the pityriasis rosea patients than among the "healthy" controls.

10. The series is reported as regards the *situation of the primary plaque, interval between the appearance of the plaque and the generalized outbreak, the order in which different regions are involved by the generalized outbreak, situation of the most advanced lesions, duration, itching, disturbances in pigmentation at the site of earlier pityriasis rosea lesions.*

11. *Recurrences* were found to supervene in 2.8 per cent of cases, which is statistically significantly higher than the incidence of recurrences in series recorded in the literature.

12. The *occupational distribution* was not found to differ significantly from that of the population of Gothenburg.

13. *Laboratory tests* were performed in approximately 50 pityriasis rosea patients and an equal number of matched "healthy" controls. Comparative study of these two groups showed the following to be statistically significant in the pityriasis rosea patients:

- a) a decrease in the number of *red blood cells* (but within "normal limits");
- b) a shift to the left in the *white blood picture*;
- c) an increase in the number of *monocytes* (but within "normal limits");
- d) a decrease in the number of *thrombocytes* (indicative) (but within "normal limits");
- e) elevation of the *erythrocyte sedimentation rate* (indicative) (but within "normal limits");
- f) reduction of the *bleeding time* (but within "normal limits");
- g) a rise in *total protein* (significant increase in  $\alpha_1$  globulin and albumin, but within "normal limits");

On the other hand, no differences between the patients and controls were found as regards the *haemoglobin level, total number of white blood cells, eosinophils, lymphocytes, clotting time, prothrombin index,  $\alpha_2$  globulin, beta globulin, gamma globulin, icterus index, or anti-streptolysin titre.*

## RÉSUMÉ

Le matériel d'étude comprend 826 patients atteints de pityriasis rosé, traités de 1949 à 1959 à la clinique dermatologique de Gothembourg. On a pris comme points de comparaison des témoins de même âge et de même sexe et apparemment sains.

1. La *fréquence* à cette clinique des cas de pityriasis rosé a été, grosso modo, régulière au cours de ces 11 années. Cette affection semble relativement commune à Gothenbourg.
2. *Distribution par sexe*: on a noté un nombre égal d'hommes et de femmes parmi les sujets atteints.
3. *Distribution par âge*: prépondérance numérique de patients âgés de 10 à 34 ans. Cette prépondérance est réelle, tant pour les hommes que pour les femmes; elle n'est pas l'expression d'une répartition spéciale des ressortissants de l'hôpital.
4. Des *variations saisonnières* sont affirmées par les statistiques qui révèlent une diminution du nombre des cas en été et vers décembre-janvier. Ces variations saisonnières ne sont pas à imputer aux irrégularités constatées dans le chiffre des consultations données à l'ensemble des patients atteints d'affections cutanées suivant les périodes de l'année. La hausse et la baisse dans la courbe saisonnière de fréquence des cas de pityriasis rosé se font peu à peu par une montée, ou une descente, lente et régulière.
5. L'apparition d'un certain nombre de cas dans un *milieu restreint* n'est pas une exception.
6. On rencontre *dans la famille des patients* atteints de pityriasis rosé un plus grand nombre de personnes atteintes d'asthme ou d'eczéma que chez les témoins, et ceci dans une proportion très significative statistiquement.
7. Parmi les *maladies antérieures* on a constaté que les infections cutanées et l'eczéma s'étaient présentés avec une fréquence plus élevée, statistiquement affirmée, chez les patients atteints de pityriasis rosé que chez les témoins. Aucune différence entre les deux groupes n'a été constatée quant à 40 autres états pathologiques étudiés.
8. Les *facteurs* suivants, considérés jusqu'ici comme *susceptibles de provoquer ou de causer* le pityriasis rosé, ont été étudiés; pour permettre d'établir une comparaison, ils ont également été étudiés chez un groupe témoin d'individus sains:
  - a. *séborrhée et pityrosporum ovale du cuir chevelu*,
  - b. *vêtements neufs ou humides*,
  - c. *chocs psychiques ou troubles psychiques antérieurs graves*,
  - d. *infections antérieures* (amygdalite, rhume, sinusite, infection dentaire, infection cutanée). Ces facteurs ne s'étaient pas présentés chez les patients atteints de pityriasis rosé avec une fréquence plus élevée, statistiquement reconnue, que chez les témoins.
  - e. il n'y avait pas parmi les femmes atteintes de pityriasis rosé un surnombre statistiquement valable de cas de *gravidité* par rapport aux femmes atteintes d'autres affections cutanées.
  - f. un *médicament* (l'or) semblerait dans 1 cas sur 108 avoir déclenché la maladie.
 On nous transmet des observations concernant des états analogues à ceux présentés par le pityriasis rosé et survenus au cours de traitements par la *méthopromazine*.
- g. On n'a pas constaté dans le matériel dont on disposait de cas où des *vaccinations* seraient à mettre en rapport avec des éruptions de pityriasis rosé.
9. On n'a pas constaté la présence de *prodromes* tels que fatigue, fièvre, nervosité, maux de tête, troubles gastro-intestinaux, douleurs des articulations et malaises, plus souvent que chez les témoins "sains".
10. L'examen porte sur la *localisation des médaillons primaires*, le *laps de temps écoulé entre l'apparition de ceux-ci et la généralisation de l'éruption*, l'*ordre dans lequel les diverses parties du*

corps sont atteintes, les localisations les plus marquantes, la durée de l'éruption, le prurit, les altérations pigmentaires faisant suite aux plaques de p.r.

11. On a constaté des récurrences dans 2,8 % des cas, ce qui, statistiquement, dépasse nettement la fréquence des récurrences dans l'ensemble du matériel fourni par la littérature.

12. La répartition par profession des patients atteints de p.r. n'est pas sensiblement différente de celle de l'ensemble de la population de Gothembourg.

13. On a pratiqué des examens de laboratoire sur une cinquantaine de patients atteints de p.r. et sur un nombre égal de témoins "sains", d'âge et de sexe correspondants. La comparaison des résultats montre chez les premiers avec des chiffres statistiquement très significatifs:

- a. diminution du nombre des *hématies* (tout en restant dans les "limites normales"),
- b. déviation vers la gauche de la *formule d'Arneht*,
- c. augmentation du nombre des *monozytes* (dans "les limites normales"),
- d. accélération de la *vitesse de sédimentation* (dans "les limites normales"),
- e. du nombre des *thrombocytes* (dans "les limites normales"),
- f. diminution du temps de saignement (dans "les limites normales"),
- g. augmentation des *albumines et des albuminoïdes* (augmentation significative de la globuline alpha-1 et de l'albumine; dans "les limites normales").

Par contre, on n'a pas constaté de différences entre les deux groupes en ce qui concerne: l'hémoglobine, la nombre de globules blancs, l'éosinophiles, les lymphocytes, le temps de coagulation, le taux de la prothrombine, les globulines alpha -2, beta et gamma, le taux des pigments biliaires, le taux de l'antistreptolysine.

#### ZUSAMMENFASSUNG

Das Material umfasst 826 Patienten mit Pityriasis rosea, die während der Jahre 1949—1959 in der Hautklinik in Göteborg behandelt worden sind. In Fällen, in denen es möglich war, sind Vergleiche mit äusserlich gesunden Kontrollpersonen von gleichem Alter und Geschlecht angestellt worden.

1. Die Häufigkeit von Pityriasis rosea-Fällen in der Klinik ist während der angegebenen Zeitspanne von 11 Jahren im grossen und ganzen von Jahr zu Jahr unverändert geblieben. Die Krankheit scheint in Göteborg verhältnismässig häufig vorzukommen.

2. Die Geschlechtsverteilung weist eine ungefähr gleich grosse Anzahl von Fällen bei Männern und Frauen auf.

3. Die Altersverteilung zeigt ein Ueberwiegen der Altersklassen von 10—34 Jahren. Sie erweist sich für sowohl Männer als auch Frauen als Faktum und nicht als Ausdruck irgendeiner besonderen Alterszusammensetzung innerhalb der Bevölkerung des Aufnahmebereichs der Klinik.

4. Die jahreszeitlichen Schwankungen werden durch eine statistisch sichergestellte, geringere Anzahl von Fällen während der Sommermonate und um den Jahreswechsel herum nachgewiesen. Es zeigt sich, dass die jahreszeitlichen Schwankungen nicht darauf beruhen, dass sich die Besuchsfrequenz sämtlicher Patienten mit Hautkrankheiten bei den Kliniken während der verschiedenen Zeiten des Jahres ändert. Die Inklination bzw. Deklination der Saisonkurven für die Pityriasis rosea — Frequenz geschieht stufenweise durch allmähliche, langsame Frequenzzunahme bzw. —abnahme.



5. Das Vorkommen einer geringen Anzahl von Fällen *innerhalb der gleichen intimen Umgebung* ist nicht als Seltenheit anzusehen.

6. Unter den *Verwandten* von Patienten mit Pityriasis rosea befindet sich mit statistisch signifikanter Sicherheit eine im Vergleich zum Kontrollmaterial erhöhte Anzahl von Personen mit Asthma und Ekzem.

7. Es wird nachgewiesen, dass von *früher durchgemachten Krankheiten* Hautinfektionen und Ekzeme bei Patienten mit Pityriasis rosea in einer statistisch sichergestellten höheren Frequenz vorgekommen sind als bei Normalpersonen. Bei weiteren 40 untersuchten Erkrankungsfällen ist kein Unterschied zwischen den beiden Gruppen ersichtlich.

8. Folgende *Faktoren*, von denen man früher glaubte, dass sie Pityriasis rosea hervorrufen oder verursachen könnten, sind untersucht worden, wobei ein Vergleich mit dem Vorkommen derselben Faktoren bei einem »gesunden«, auf den Zweck abgestimmten Kontrollmaterial vorgenommen wurde:

- a. *Seborrhoe des behaarten Kopfes* und *Pityrosporum ovale* in der Kopfhaut,
- b. neue oder feuchte *Kleider*
- c. *psychische Traumata* und *früher vorgekommene schwere, psychische Krankheit*
- d. *vorangegangene Infektionen* (Tonsillitis, allgemeine Erkältung, Sinusitis, dentale Infektion, Hautinfektion).

Sämtliche Faktoren kommen bei Pityriasis rosea — Patienten nicht in statistisch sichergestellter, höherer Frequenz vor als bei Kontrollpersonen.

e. *Schwangerschaft* ist bei Pityriasis rosea-Patienten nicht in signifikant höherer Frequenz vorgekommen als bei Patienten mit anderen Hautkrankheiten,

f. *Arzneimittel* dürften in einem von 108 Fällen die Krankheit ausgelöst haben (Gold).

Es werden Beobachtungen über Pityriasis rosea-ähnliche Krankheitszustände mitgeteilt, die während der Behandlung mit *Methopromazinpräparaten* aufgetreten sind.

g. *Impfungen* haben bei diesem Krankenmaterial nicht mit dem Ausbruch von Pityriasis rosea in Verbindung gesetzt werden können.

9. *Prodromalsymptome* in Form von Müdigkeit, Fieber, Nervosität, Kopfschmerzen, Magen- und Darmbeschwerden, Gliederschmerzen und Uebelkeit sind nicht in grösserem Umfang als bei dem »gesunden« Kontrollmaterial aufgetreten.

10. Es wird über durchgeführte Untersuchungen berichtet betreffs der *Lokalisation der Primärmedaillons, des Zeitabstandes zwischen Auftreten von Primärmedaillons und dem allgemeinen Ausbruch der Krankheit, der Reihenfolge, in welcher verschiedene Stellen von dem allgemeinen Ausbruch in Mitleidenschaft gezogen werden, der Lokalisationen der am stärksten ausgeprägten Veränderungen, Duration, Jucken, Pigmentstörungen an den Stellen früherer Pityriasis rosea-Effloreszenzen.*

11. Es wird nachgewiesen, dass in 2,8 % *Rezidive* vorkommen, was mit statistischer Signifikanz höher ist als die Rezidivfrequenz in zusammengestelltem Material aus der Literatur.

12. Die *Berufsverteilung* bei Pityriasis rosea-Patienten weicht nicht signifikant von der entsprechenden Verteilung innerhalb der Stadt Göteborg ab.

13. Es wurden *Laboratoriumsuntersuchungen* bei ungefähr 50 Patienten mit Pityriasis rosea sowie einer gleich grossen Anzahl »gesunder« Kontrollpersonen, die nach Alter und Geschlecht dem Zweck angepasst waren, durchgeführt. Beim Vergleich zwischen der

Pityriasis rosea-Gruppe und der Kontrollgruppe hat bei der ersteren mit statistischer Signifikanz nachgewiesen werden können:

- a. Verminderung der Anzahl der roten Blutkörperchen (jedoch innerhalb der »Normalwerte«)
- b. Linksverschiebung des weissen Blutbildes
- c. Erhöhung der Blutsenkungsgeschwindigkeit (jedoch innerhalb der »Normalwerte«)
- d. Verminderung der Anzahl der Thrombozyten (jedoch innerhalb der »Normalwerte«)
- e. Erhöhung der Anzahl der Monocyten (jedoch innerhalb der »Normalwerte«)
- f. Verkürzung der Blutungszeit (jedoch innerhalb der »Normalwerte«)
- g. Erhöhung des Gesamteiweissgehaltes (signifikante Erhöhung von alpha-1-Globulin und Albumin) (jedoch innerhalb der »Normalwerte«)

Dagegen sind keine Unterschiede zwischen den beiden Gruppen nachgewiesen worden betreffend:

*Hämoglobin, Anzahl weisser Blutkörperchen, eosinophiler Leucozyten und Lymphozyten, Koagulationszeit, Prothrombinindex, alpha-2, beta- und gamma-Globulin, Ikerusindex, Antistreptolysintiter.*

#### RESUMEN

El material comprende 826 pacientes con pityriasis rosea que fueron tratados en la Clínica de Dermatología de Gotemburgo durante los años 1949—1959. Se han realizado comparaciones entre estos casos y personas de control de la misma edad y sexo aparentemente sanas.

1. La frecuencia de pacientes con pityriasis rosea en dicho hospital ha sido durante este periodo de 11 años, por lo general, invariable de un año a otro. La enfermedad parece ser relativamente frecuente en Gotemburgo.
2. La clasificación de los pacientes según el sexo muestra aproximadamente igual número de mujeres que de hombres.
3. La clasificación según las edades muestra una preponderancia de éstas entre 10 y 34 años. Tanto en los hombres como en las mujeres esta preponderancia parece ser real, y no es la manifestación de una estructura de edades especial de la población del distrito correspondiente a dicho hospital.
4. Las variaciones estacionales muestran, con una seguridad probada por estadísticas, un menor número de casos durante los meses de verano y hacia finales de año. Se demuestra que las variaciones estacionales no dependen de un cambio en la frecuencia de visitas a la clínica de todos los pacientes con enfermedades de la piel durante las diferentes estaciones del año. Las curvas estacionales de la frecuencia de pityriasis rosea — inclinación respectivamente declinación — sucede gradualmente con sucesivo y lento ascenso respectivamente descenso.

5. No debe considerarse raro que aparezcan algunos cuantos casos *dentro del mismo ambiente íntimo*.

6. Los *parientes* de los pacientes con pityriasis rosea presentan, con una seguridad estadística significativa, un mayor número de personas con asma y eczema que el material de control.

7. Se demuestra por medio de estadísticas que, de las enfermedades que los pacientes con pityriasis rosea habían tenido anteriormente, las infecciones de la piel presentan una frecuencia mayor que en las personas normales. Respecto a otras 40 enfermedades investigadas, no existe ninguna diferencia entre ambos grupos.

8. Se han investigado los *factores* siguientes que anteriormente se creía que podían *proveer o causar* pityriasis rosea, haciéndose una comparación con la existencia de estos factores en un material de control «sano» en las mismas condiciones:

- a. *seborrea del cuero cabelludo y pityrosporum oval en el cuero cabelludo.*
- b. *ropas nuevas o húmedas*
- c. *traumas psíquicos y enfermedades psíquicas graves tenidas anteriormente*
- d. *infecciones anteriores (tonsilitis, constipados, sinusitis, infecciones dentales, infecciones cutáneas).*

Todos estos factores no se dieron con una frecuencia mayor estadísticamente verificada en los pacientes de pityriasis rosea que en las personas de control.

e. no hubo *embarazos* en los pacientes con pityriasis rosea con una frecuencia mayor significativa que en pacientes con otras enfermedades de la piel.

f. en uno de los 108 casos parece probable que la enfermedad fué provocada por *medicamentos* (oro).

Se informa sobre la aparición de estados similares a la pityriasis rosea durante un tratamiento con *preparados de metopromacina*.

g. en el material estudiado no se han podido relacionar las *vacunas* con la erupción de pityriasis rosea.

9. No aparecieron *síntomas prodrómicos* en forma de cansancio, fiebre, nerviosismo, dolor de cabeza, molestias gastrointestinales, dolores en las articulaciones y desazón, en mayor extensión que en el material de control «sano».

10. Se informa acerca de las investigaciones realizadas respecto a *la localización de las primeras ronchas, el intervalo de tiempo entre éstas y la erupción general, el orden en que la erupción se extiende a las diferentes partes del cuerpo, la localización de los cambios más pronunciados, la duración, prurito, y alteraciones pigmentarias en sitios atacados anteriormente por eflorescencias de pityriasis rosea.*

11. Se demuestra que en un 2,8 % de los casos aparece *recidivo*, el cual, con significación estadística, es más elevado que la frecuencia de recidivos en el material recogido en la bibliografía.

12. La clasificación de los pacientes con pityriasis rosea según el *oficio* no diverge de un modo significativo de la existente en la ciudad de Gotemburgo.

13. Se han realizado pruebas de laboratorios de unos 50 pacientes con pityriasis rosea a la vez que de un número igual de personas de control «sanas» en las mismas condiciones de edad y sexo. Al comparar el material de pityriasis rosea y el material de control se ha podido demostrar, con significación estadística, lo siguiente en el primer grupo:

- a. disminución de *glóbulos rojos* (aunque dentro de los «valores normales»).
- b. desviación de la *fórmula de Arneth* hacia la izquierda.
- c. disminución del número de *trombocitos* (aunque dentro de los «valores normales»).
- d. aumento del número de monocitos (aunque dentro de los «valores normales»).
- e. aumento de la *velocidad de sedimentación* (aunque dentro de los «valores normales»).
- f. disminución del *tiempo de hemorragia* (aunque dentro de los «valores normales»).
- g. aumento de *albúmina total* (aumento significativo de la alfa-1-globulina y albumina (aunque dentro de los «valores normales»)).

Sin embargo, no se ha hallado ninguna diferencia entre los dos materiales en lo que respecta a: *hemoglobina, número de leucocitos, y de leucocitos eosinófilos, y linfocitos, tiempo de coagulación, índice de protrombina alfa-2, beta y gamma globulina, nivel de la bilirrubina en la sangre y título de antistreptolisina.*

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