

## Prevalence of Psoriasis in a Norwegian Lapp Population

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The occurrence of psoriasis in a Norwegian Lapp population was estimated by reviewing medical records in the local health centre of Kautokeino. Altogether 40 cases of psoriasis were registered in the study population comprising 99.6% of the total population of 2,963 individuals. Thirty-five cases of psoriasis belonged to the Lappish population of 2,508 people, giving a prevalence of 1.4%, with no difference between males and females. Five cases of psoriasis were found in the non-Lappish population of 442 individuals which gives a prevalence of 1.1% with no sex differences. A peak prevalence among Lapps was observed in the age groups 20-39 years (2.7%), equal for both sexes and in females aged 50-59 years (3.2%), whereas a lower prevalence of 0.6% was found in the age group 40-49 years. A seronegative psoriatic arthritis was recorded in 6 of the 35 Lappish compared to none of the non-Lappish cases. A familial association was confirmed in 11 of the 35 Lappish cases, in none of the non-Lappish. **Key words:** Psoriasis, Lapp population, seronegative psoriatic arthritis, familial association.

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Psoriasis is a multifactorial, genetically determined, inflammatory and proliferative skin disease of unknown etiology. The clinical manifestations are sharply demarcated erythematous-squamous lesions, varying in size from pinpoint to large plaques, particularly on the extensor prominences and the scalp. The disease is enormously variable in duration and extent and morphological variants are common. Reliable information on its incidence and prevalence is still limited and mainly Scandinavian in origin. Large-scale population studies made in Denmark (1), the Faroes (2), Sweden (3) and Norway (4) indicate that psoriasis is affecting between about 1.5 and 3% of the Scandinavian population. The most reliable figures are probably those reported by Lomholt after a study of an isolated insular population (2). He personally visited all 2,341 households consisting of 10,984 individuals on the seven north-eastern islands of the Faroes and found the prevalence of psoriasis to be 2.84%.

Prevalence is found to differ between races as well as geographically (5), although racial and ethnic variations are hard to ascertain. In general, the disease appears to be most common in northern Europe and among whites in North-America, less common in yellow-brown people (6-8) and rare in black people which might explain the low prevalence in American Negroes (7). Psoriasis seems to be exceedingly rare in the pure American Indians (9), and was undetectable in 25,000 Latin American Indians (10).

In a recent study the overall prevalence of psoriasis in Norway has been estimated to 1.4%, ranging from 0.5% (South) to 2.8% (North) (4). Another population study involving 14,667 persons indicated an overall "life-time" prevalence as

high as 4.8% in the age group 20-54 years in the district of Tromsø in North Norway (11). In contrast, the same author found a low prevalence of 0.6% in Norwegian Lapps living in North Norway (12), while psoriasis was found in 3 (1.6%) of 185 Finnish Lapps (13).

The Lapps constitute a distinct and well-defined population of approximately 40,000 individuals, most of them living in the northern parts of Norway, Finland, Sweden and the Kola peninsula of Russia. They have their own language, and are unique in their culture. Their physical appearance with short stature, broad face, dark pigmentation and oblique eye openings differ from the other Scandinavian populations. They are proud of their inheritance, intermarriage with caucasians is a rarity and they have claimed aboriginal status. The origin of the Lapps is unknown; one theory claims that they are of Mongolian-Asiatic descent, and another that they represent a remnant of an ancient West European stock (14). A third theory has also been discussed which suggests that Lapps represent the descendants of an ancient nordic population which survived the glacial period on the costal area of North Scandinavia (14).

Most of the about 25,000 Norwegian Lapps are living in Finnmark, the most northern county in Norway. The Kautokeino community is 85% Lappish and is the only community which has defined itself as Lappish. Kautokeino is the largest community in Norway, covering nearly 10,000 km<sup>2</sup> consisting mainly of mountain plateaus. Two thirds of the population are living in the two small villages Maze and Kautokeino, while the final third is quite a distance away from the other two. The population is young, 35% under 20, and only 18% 50 years or over. Most of the people are in some way associated with the reindeer trade and half of the 300 nomadic Lapp families of the Finnmark county are living in Kautokeino.

Apart from the studies of Kavli (12) and Karvonen (13), there are to our knowledge no other published prevalence studies on psoriasis in Lapps. During more than 15 years decentralized dermatological consultations in Finnmark county, psoriasis among Lapps was not considered to be so exceptionally rare as previously estimated. This study, therefore, was initiated in order to establish the prevalence of psoriasis among Lapps, and to compare the prevalence with that of non-Lappish Norwegians.

### MATERIAL AND METHODS

In the summer of 1991 the authors made a careful registration of all patients with psoriasis by reviewing 2,950 medical records in the local health centre of Kautokeino comprising 99.6% of all 2,963 people living in Kautokeino at that time. Patients not previously seen by a dermatologist or without a confirmed diagnosis were called up and offered a free consultation. For comparison purposes a survey of the registered inpatient and outpatient psoriatics at our dermatological department in Tromsø was carried out. Following registration all psor-

Table I. Prevalence of psoriasis according to age and sex among Lapps in the Kautokeino community

Age (years)	Males			Females		
	Psoriasis			Psoriasis		
	n	n	%	n	n	%
0-9	205	1	0.5	212	1	0.5
10-19	229	1	0.4	229	1	0.4
20-29	244	6	2.4	217	7	2.8
30-39	193	4	2.1	185	6	3.2
40-49	192	1	0.5	143	1	0.7
50-59	101	1	1.0	94	3	3.2
60-69	66	1	1.5	81	1	1.2
70-	56	0	0	61	0	0
Total	1286	15	1.2	1222	20	1.6

There are no significant differences between males and females or between age groups,  $1.4 \pm 0.47\%$ , confidence interval 95%.

riatic patients were separated into Lapps and non-Lapps. The criteria chosen for a racially "pure" Lapp were: both parents should be Lapps; there should be no known recent admixture of non-Lappish genes in the family, and Lappish should be the main language. The segregation of non-Lappish from Lappish individuals was carried out by one of the authors who during the last 26 years has been working in the community of Kautokeino as a district general practitioner. Not only has he acquired first-hand knowledge of the health conditions among the population but he knows almost every family and single person in the community personally and is, therefore, able to distinguish Lapps from non-Lapps with great certainty. For comparison purposes the non-Lappish psoriatic patients were included in the study. Patients' sex, age, arthropathy, familial relationships and the doctor verifying the diagnosis, were recorded.

The statistical significance of differences between groups was tested by the  $\chi^2$ -test.

## RESULTS

A total of 40 cases of psoriasis were found among all inhabitants of the Kautokeino community. Thirty-five (20 female and 15 male) psoriatics belonged to the Lappish population of 2,508 individuals, giving a prevalence of 1.4% (1.6% for females and 1.2% for males; no significant difference) (Table I). The non-Lappish population of 442 individuals accounted for 5 cases of psoriasis (3 females and 2 males) which gives a prevalence of 1.1% (1.4% for females and 0.9% for males; no significant difference) (Table II).

A higher prevalence (2.7%) in the age groups 20-39 seemed to be present in both sexes and in females aged 50-59 (3.2%) (Table I), whereas a lower prevalence of 0.6% was found in the age group 40-49. None of these, however, differed in a statistically significant way from the overall prevalence.

A seronegative psoriatic arthritis was recorded in 6 cases, all belonging to the Lappish population, but only 2 of the 7 hospitalized (5 Lappish and 2 non-Lappish) individuals belonged to the arthritis group (Table III).

The diagnosis psoriasis appeared in 31 of the 35 Lappish cases made by a dermatologist compared to 2 of the 5 non-Lappish cases; the remaining 7 cases were diagnosed by a general practitioner.

A familial association was confirmed in 11 of the 35 Lappish

cases, none in the non-Lappish cases. Patients no. 6, 13 and 30 were brother and sisters, respectively, no. 8 and 15 sisters, whereas no. 32 was a male cousin to the last mentioned. Patients no. 12 and 16 were daughters of no. 20, and no. 27 was son of no. 35.

Comparing the age composition of the Lapps with that of the total Norwegian population it is obvious that the Lappish population is a young population, 35% being under 20 years and only 18% 50 years or over; the corresponding percentages for the Norwegian population as a whole being 26% and 30%, respectively (Table IV).

## DISCUSSION

It is estimated that the prevalence of psoriasis for adults "at any given moment" in North-West Europe is between about 1.5 and 3% (15) which is not different from the findings in this study. Prevalence is found to differ between races as well as geographically (5) although racial and ethnic variations are hard to ascertain. The 1.4% prevalence of psoriasis among Norwegian Lapps in this study is in striking contrast to 0.6% found by Kavli (12), and might at least partly be due to methodological disparities. The reliability of questionnaire studies is questionable as a variety of figures have previously been reported in several Scandinavian studies. However, this method is mostly used in large epidemiological settings. In a large-scale population study by Hellgren (3) in Sweden the prevalence was ranging from 1.3% to 2.5% in different parts of Sweden and in a similar study by Braathen variations between 0.5% and 2.8% were found in different parts of Norway (4). Kavli (11) found a "lifetime" prevalence of 4.8% in subjects aged 20-54 years in the Tromsø area (northern part of Norway) which partly might be explained by both genetics and the colder climatic conditions, i.e. a long and dark winter. The figures from the Faroe Islands of 2.84% (2), on the other hand, are based on the prevalence of psoriasis at a screening examination. Nevertheless, this high prevalence represents a minimum prevalence but may, on the other hand, have been influenced by in-breeding in a closed community.

Table II. Prevalence of psoriasis according to age and sex among non-Lapps in the Kautokeino community

Age (years)	Males			Females		
	Psoriasis			Psoriasis		
	n	n	%	n	n	%
0-9	36	0	0	38	0	0
10-19	40	0	0	40	1	2.5
20-29	42	1	2.4	38	0	0
30-39	34	0	0	32	2	6.3
40-49	34	0	0	25	0	0
50-59	18	1	5.6	17	0	0
60-69	12	0	0	14	0	0
70-	10	0	0	12	0	0
Total	226	2	0.9	216	3	1.4

There are no significant differences between males and females or between age groups, confidence interval 95%.

Table III. *Thirty-five Lappish and 5 non-Lappish psoriatic patients in the Kautokeino community with regard to sex, age, confirmation of diagnosis, arthropathy and hospitalization*

Patient no.	Patients' sex and age	Diagnosis made by a		Arthropathy	Hospitalization
		D.	G.P.		
1	F/9	+			
2	F/16	+			
3	F/22	+			
4	F/23	+			
5	F/24	+			
6	F/24	+			
7	F/24	+			
8	F/25	+			
9	F/25	+			
10	F/30	+			
11	F/30		+		
12	F/33	+			+
13	F/34	+			
14	F/36		+		
15	F/39		+		
16	F/44	+			+
17	F/50	+			
18	F/50	+		+	
19	F/56	+		+	+
20	F/68	+		+	
21	M/9	+			
22	M/18	+			
23	M/21	+			
24	M/22	+			
25	M/24	+			
26	M/25	+			
27	M/28	+			
28	M/29	+			
29	M/30	+			+
30	M/30	+			
31	M/33	+		+	+
32	M/37	+		+	
33	M/45	+			
34	M/52		+	+	
35	M/60	+			
36	F/16		+		
37	F/33	+			+
38	F/36		+		
39	M/25	+			+
40	M/53		+		

M = male

F = female

Patients no. 1-35 = Lappish patients, no. 36-40 = non-Lappish patients

D. = dermatologist

G.P. = general practitioner

The prevalence of psoriasis in subjects of Mongolian race has previously shown to be lower than in Caucasians (8). HLA studies have shown that the Lapps have significantly lower frequencies of HLA-A1, 8 and 12 than Caucasians (16). HLA-A1, 3, 7, 8 and 12 are low or absent in Eskimos (17) and HLA-A1 low in Mongolians (18). These findings suggest a closer relationship of Lapps to Eskimos than to non-Lappish Norwegians (16). Also, it has been suggested that Eskimos from Greenland have a low prevalence of psoriasis (19). This

close relationship between Lapps and Eskimos could also be caused by selective forces, for example the peculiar climate conditions of arctic life. Kautokeino is a geographical isolated and relatively closed community with a high degree of endogamy. In fact about 9% of all marriages are among first-cousins (20). These Lapps are probably racially less impure than other Lappish groups in Norway and sufficiently isolated to permit accumulation of some genetic variation. This is most probably caused by genetic drift. Recently, mitochondrial studies comparing pure American Indians, Lapps and Caucasians have shown that the overall genetic distance between Lapps and non-Lappish Norwegians is fairly small, and lower than that found between Lapps and American Indians on one side and between American Indians and non-Lappish Norwegians on the other (Larsen M, Andresen PA & Gedde-Dahl T, personal communication). Subsequently, it is not surprising that we found the same frequency of psoriasis among Lapps in the Kautokeino community (1.4%) as Braathen found in the Norwegian population as a whole (1.4%). Also, the prevalence of 1.1% psoriatics found among the non-Lappish population of Kautokeino does not differ significantly from the above findings.

The present study includes 99.6% of all people in Kautokeino. The prevalence found, however, must be regarded as a minimum prevalence since there are several indications that cases of psoriasis have not been recorded. Some people might have had minor symptoms of psoriasis not diagnosed as such, and therefore not recorded. In fact, people seeking medical help for conditions other than skin diseases forget to inform the doctor about minor psoriatic outbreaks, while others may have been reluctant to seek medical attention for their skin discomfort, as psoriasis in their culture is still associated with uncleanliness. A general higher threshold for seeking medical attention for skin lesions and thereby eluding diagnosis might be another explanation for a decreased prevalence.

Psoriasis is a chronic disease and onset may occur at any age. The term "psoriatic" is often used to describe a person who at some point in life has had psoriatic skin lesions. If one also includes people who at some point in their lives have had psoriasis, prevalence figures will increase with age, provided psoriatic patients do not die earlier than others, and there is to

Table IV. *Age composition of the Lappish population of Kautokeino and the total population of Norway*

Age (years)	Lapps		Total Norwegian population	
	n	%	n	%
0-9	417	16.7	542.434	12.8
10-19	458	18.3	574.681	13.5
20-29	461	18.4	662.465	15.6
30-39	378	15.1	624.755	14.7
40-49	335	13.4	572.858	13.4
50-59	195	7.7	384.294	9.0
60-69	147	5.8	402.671	9.5
70-	117	4.6	485.872	11.5
Total	2508	100.0	4.250.030	100.0

our knowledge no evidence to support this. With this in mind we expected an increased prevalence with age. The population of Kautokeino consists of young subjects with many children and few old people. Thus, lowered life expectancy, which in fact is the case for the Lappish population, will reduce prevalence. The present results showing decreasing prevalence with increasing age, i.e. for people 30 years or over, are in accordance with the findings of Braathen (4) and Kavli (11) and may be explained by a higher threshold of seeking medical attention and a lower diagnostic "intensity" in older subjects. Hellgren, however, found a higher prevalence of psoriasis with greater age (3), and Farber & Nall (5) also observed an increased prevalence with age in women. In fact we too found an increased prevalence among women in the age group 50-59 years.

Our study showed a higher prevalence of psoriasis in females than in males, although not attaining statistical significance. A tendency towards a higher prevalence in the age groups 20-39 years was present for both sexes, most prominent for females. Similar findings are reported from the Helsinki area in Finland (21) and may indicate that people in this age group, who are usually in a very active phase of life, may be more prone to psoriasis outbreaks than those either younger or older.

The genetic basis of psoriasis with marked familial aggregation is indisputable. It is surprising, therefore, to find a familial occurrence of only 31% (11/35) among Lapps in the relatively closed community of Kautokeino, with a high degree of intermarriage. The findings, however, are in agreement with that reported in whites (35%) (22) but in striking contrast to that reported in the Faroese (91%) (2) and in yellow people (7%) (6).

The frequency of arthropathy in patients with psoriasis has been estimated at 5-7%. We found psoriatic arthritis in 17% of our Lappish patients with psoriasis compared to none among the non-Lappish. There is probably not only an association between ankylosing spondylitis and HLA-B27, but also an association between peripheral psoriatic arthritis (in the absence of spondylitis) and HLA-B27 (23). Thorsby (16), in fact, found a higher prevalence of HLA-B27 (25%) in Lapps in the Kautokeino area than in Caucasians (10%), which could be one explanation for the increased frequency of psoriatic arthritis in our study group.

Leaving aside the very difficult question of the origination of the Lapp population one may say that since the Lapps have probably existed for several thousand years in North Scandinavia and the Kola peninsula they should have intermixed to some degree with North Asiatic people. Consequently, we may expect evidence of Asiatic influence in the Lapps without concluding that the Lapps are mainly of Mongolian descent. Admixture from ancient times of genes from other populations of Russia, Finland, Sweden and Norway may also have occurred since the genetic distance between Norwegian Lapps and non-Lappish Norwegians is fairly small (14, 16). This is supported by this study's findings, i.e. the frequency of psoriasis among Lapps is the same as in non-Lappish Norwegians.

Although this study includes all people in Kautokeino the population group studied is rather small.

Our results, therefore, need to be confirmed by investigating other Lappish population groups.

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