

INVESTIGATIVE REPORT

Co-morbidity and Age-related Prevalence of Psoriasis: Analysis of Health Insurance Data in Germany

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Epidemiological studies indicate an increased risk of co-morbidities and an association with other inflammatory diseases in psoriasis. However, most analyses have been performed on small samples of patients. The aim of this study was to evaluate the prevalence of co-morbidities in psoriasis based on a large set of health insurance data. The database of 1.3 million patients in a German nationwide statutory health insurance scheme was analysed. Data-sets of patients with confirmed psoriasis were extracted and analysed for co-morbidities. Of 1,344,071 subjects, 33,981 had a diagnosis of psoriasis (prevalence 2.5%). Metabolic syndrome was 2.9-fold more frequent among these patients. The most common diagnoses were arterial hypertension (35.6% in psoriasis vs. 20.6% in controls) and hyperlipidaemia (29.9% vs. 17.1%). The frequencies of rheumatoid arthritis (prevalence ratio (PR) 3.8), Crohn's disease (PR 2.1) and ulcerative colitis (PR 2.0) were also increased among patients with psoriasis. In conclusion, psoriasis is associated with significant co-morbidities that imply an elevated risk of severe complications. Key words: psoriasis; co-morbidity; healthcare; epidemiology.

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With a prevalence of 2–3%, psoriasis vulgaris is one of the most important chronic skin diseases (1). Due to the serious impairments in quality of life caused by the usually chronic and often refractory course of the disease, psoriasis is of considerable socioeconomic relevance (2, 3). In Germany the point prevalence is 2.1% (4), and more than 75% of patients are younger than 60 years old.

Different types of diseases are associated with psoriasis. First, there is a distinct pattern of enthesitis, osteitis and synovitis that is generally referred to as psoriasis arthritis (PsA) (5–7). Recent data suggest a prevalence of PsA among German patients attending a dermatologist for psoriasis of approximately 20% (8).

It is also well known from several studies that patients with psoriasis carry an increased risk of developing co-morbidities related to the metabolic syndrome (9), which includes arterial hypertension, adipositas, and abnormalities in lipid and glucose metabolism. This association is believed to account, at least partially, for the higher rate of cardiovascular complications observed among patients with psoriasis (10, 11) and to contribute to the decreased life expectancy observed in patients with severe disease (12, 13). The exact relationship between cutaneous inflammation and metabolic syndrome is not fully understood, but there is evidence that metabolic changes are not exclusively the consequence of longstanding active skin disease, but may, in fact, precede the first onset of psoriasis (14). Finally, epidemiological as well as genetic studies point to a possible relationship between psoriasis and other immune-mediated inflammatory conditions, including Crohn's disease (15, 16).

Most studies on conditions associated with psoriasis, however, have been performed on small and selected samples of patients. To date, no representative data are available for Germany.

The objective of this study was to evaluate the prevalence of co-morbidities, especially those related to metabolic syndrome, in psoriasis, based on a large sample of German health insurance data.

METHODS

Study design and patients

Secondary data were retrieved from a database of more than 1.3 million individuals insured by a German nationwide statutory health insurance. All data-sets of patients with World Health Organization (WHO) International Classification of Diseases (ICD)-10 codes marking psoriasis (L40.*) in the year 2005 were extracted and analysed for diagnoses related to co-morbidities of interest. Individuals from the data-set with no diagnosis of psoriasis served as controls.

Patients were counted as cases with psoriasis if there was at least one visit to a physician documented with the diagnostic codes L40.* and subcodes. Co-morbidities were also evaluated by ICD-10 diagnoses.

Statistics

Data analysis was descriptive and was performed by the Pharmafacts Research Institute, Berlin, Germany. Prevalences are

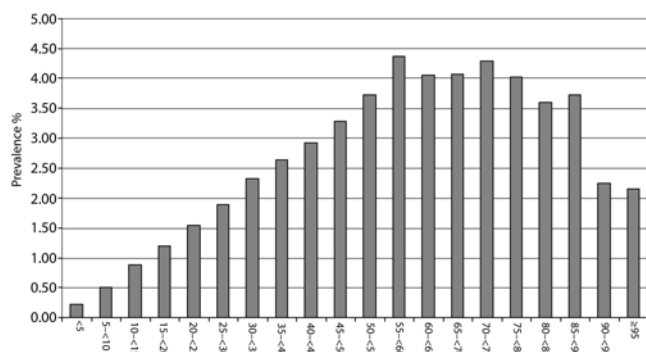


Fig. 1. Prevalence of psoriasis (%) among health insured persons according to age group ($n=33,981$).

given as percentage values. For co-morbidities prevalence ratios (PR) were calculated by comparing the prevalence rate in the psoriatic with the respective rate in the non-psoriatic group. Their corresponding 95% confidence intervals (CI) were computed by a general method based on constant χ^2 boundaries.

RESULTS

Prevalence of psoriasis

Out of 1,344,071 data sets analysed, 33,981 individuals were diagnosed with psoriasis, equivalent to a prevalence of 2.53%. Fig. 1 shows the prevalence of psoriasis in the different age groups. The highest prevalence of more than 4% was seen in the age groups between 55 and 75 years of age (Fig. 1).

Co-morbidities

Individuals diagnosed with psoriasis showed markedly increased rates of co-morbidities compared with individuals without psoriasis. Overall, 57.9% ($n=19,663$) of subjects with psoriasis and 34.5% of control subjects ($n=451,755$) were diagnosed with at least one co-morbidity of interest (Table I). The difference between patients with psoriasis and control subjects was observed for all age groups (Fig. 2). Metabolic syndrome was more frequently diagnosed in patients with psoriasis

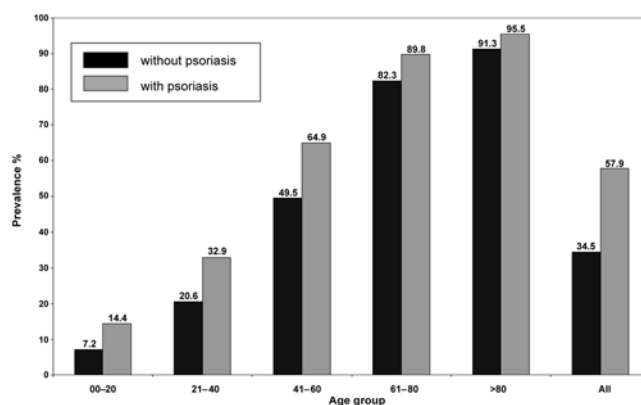


Fig. 2. Prevalence (%) of at least one co-morbidity among health insured persons without ($n=1,310,090$) and with psoriasis ($n=33,981$) according to age group.

than in individuals without psoriasis (PR 2.9). In addition, co-morbidities related to metabolic syndrome including arterial hypertension, hyperlipidaemia, obesity, and diabetes mellitus were significantly more common among patients with psoriasis (Table I). As depicted for obesity, the increased prevalence of these co-morbidities was present in all age groups (Fig. 3).

Several inflammatory diseases were diagnosed more often in subjects with than in those without psoriasis, including rheumatoid arthritis (PR 3.8), Crohn's disease (PR 2.1) and colitis ulcerosa (PR 1.9) (Table I). The increased prevalence rate for patients with psoriasis was statistically significant for all co-morbidities (Figs 2 and 3).

DISCUSSION

The aim of the present investigation was to collect data on the co-morbidity of psoriasis in a Germany using the database of a national health insurance scheme. A possible limitation is that the analysis is based completely on secondary data; hence, a control of the diagnosis was not possible. However, the reliability of the database has been demonstrated in previous studies on other indications (17).

Table I. Prevalence (percentage) of selected co-morbidities in patients with and without psoriasis ($n=1,344,071$ persons)

Diagnosis	ICD-10 code(s)	With psoriasis ($n=33,981$)	Without psoriasis ($n=1,310,090$)	Prevalence rate (95% CI)
Rheumatoid arthritis	M05.*	0.95	0.25	3.84 (3.43–4.31)
Metabolic syndrome	#	0.18	0.06	2.86 (2.21–3.71)
Crohn's disease	K50.*	0.92	0.45	2.06 (1.84–2.31)
Diabetes mellitus	E11.* E13.* E14.*	12.12	6.01	2.02 (1.96–2.08)
Colitis ulcerosa	K51.*	1.09	0.56	1.91 (1.72–2.11)
Ischaemic heart disease	I20.* ... I25.*	13.30	7.12	1.87 (1.82–1.92)
Hyperlipidaemia	E78.*	29.88	17.05	1.75 (1.72–1.78)
Arterial hypertension	I10.* ... I13.*	35.61	20.57	1.73 (1.71–1.76)
Obesity	E66.*	17.82	10.39	1.72 (1.68–1.76)
All co-morbidities (at least one)		57.86	34.48	1.68 (1.66–1.69)

I10.* or I11.* or I12.* or I13.* and E66.* and R73.0 and E78.*

CI: confidence interval; ICD-10: World Health Organization International Classification of Diseases.

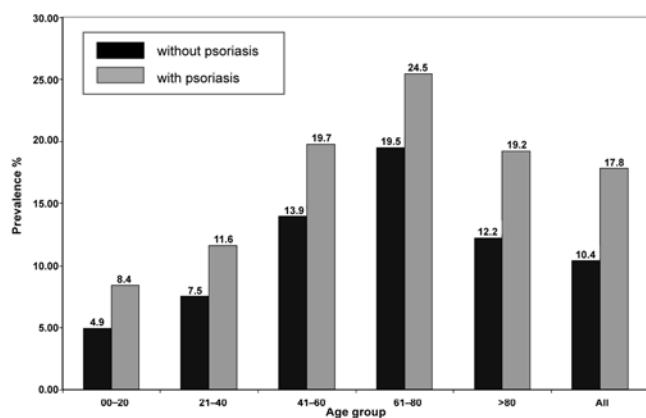


Fig. 3. Prevalence (%) of obesity among health insured persons without ($n=1,310,090$) and with psoriasis ($n=33,981$) psoriasis according to age group.

The design and analysis of the present study were performed according to the standards for using secondary data sources in epidemiological research (18).

As pointed out in methodological publications: (i) information from health insurance data can be assumed to be of high specificity if based on diagnostic and procedure data; and (ii) the external but not the internal validity of the findings may be reduced if the database is not representative for the general population (19). Rothman et al. (20) argues, likewise, that, by restricting a study to those definite cases, some true cases may be missed, which may reduce precision of the study but not lead to a biased relative effect estimate.

In the present data-set, the one-year prevalence of psoriasis (2.5%) is in the same range as the point prevalence obtained in a large nationwide primary study (2.1%) (4).

Another factor supporting the representative character of the present data-set is the fact that the prevalences of co-morbidities assessed in this study are within the range of the data published as the German standard. Due to differences in combining and coding the diversified diagnoses there are no data available for the one-year prevalence of ischaemic heart disease that could serve as an adequate reference for the present findings. The one-day point-prevalence assessed in the DETECT Study (21) for a nationally representative sample of primary care settings was 12.1%, but, as this study was based on questionnaires and diagnostic screening, this is of restricted comparability.

However, for the diagnoses of diabetes mellitus and hypertension, our findings are supported by the results of other studies: a secondary analysis of combined data from six large sickness funds revealed a prevalence of diabetes mellitus of 6.5% (22); and in the National Health Survey the prevalence of hypertension was found to be 23.1%.

The remaining limitation is that any approach that identifies only those psoriatic patients who are in medi-

cal care, may overlook patients who never seek a physician. However, since there is a statutory health insurance system in Germany, very few persons are not insured and neglect medical care for financial reasons.

The association between psoriasis and a pattern of co-morbidities related to metabolic syndrome is now well established (5, 23–27) and seems to be influenced by disease severity (28). Earlier studies reported odds ratios for metabolic syndrome ranging from 1.7 for outpatients with psoriasis compared with outpatients with skin diseases other than psoriasis (27) up to 5.3 for patients hospitalized for psoriasis compared with hospital-based controls (11). In this much larger and less selected data-set the diagnosis of metabolic syndrome was observed 2.9 times more often among patients with psoriasis than among control subjects, with an overall frequency of 0.18% among patients and 0.06% among control subjects. Diagnoses of single diseases that together constitute metabolic syndrome, including arterial hypertension, hyperlipidaemia, obesity and diabetes were all more common among patients with psoriasis (Table I), with prevalence ratios of between 1.7 and 2.0. It is advisable for dermatologists to include this knowledge in their medical care of patients with psoriasis, i.e. to promote weight reduction and regularly control blood pressure as well as lipid and glucose homeostasis. The affirmed finding of an increased co-morbidity in psoriasis suggests that additional information on specific prevention measures may need to be included in educational programmes as well as guidelines on psoriasis treatment. The pattern of co-morbidity observed in this investigation supports the concept of a classification of psoriasis as a systemic inflammatory condition together with other types of chronic inflammation including rheumatoid arthritis and inflammatory bowel disease (29). The potential overlap in the pathophysiology of these diseases is underscored by the responsiveness to similar treatment modalities, such as methotrexate and the tumour necrosis factor antagonists, as well as the discovery of common genetic susceptibility loci (16).

This study confirms that this group of immune-mediated diseases, including psoriasis, also share the association with co-morbidities related to metabolic syndrome. The associated diseases may lead to further reductions in quality of life among patients with psoriasis and reduced life expectancy of patients severely affected by the disease (13).

The association of psoriasis and cardiovascular diseases has been described in a variety of publications (25–28, 30–33). However, in a recent publication, an association of psoriasis and cardiovascular events (such as myocardial infarction) was found only in subgroups of patients (34). Accordingly, the question as to which characteristics of psoriasis and psoriatic patients are strong predictors of cardiovascular disease remains unanswered.

As continuous control of inflammation has been shown to reduce the risk of cardiovascular complications in psoriasis (35) and rheumatoid arthritis (35–37), the present report reinforces the therapeutic concept of a continuous disease control in patients with more severe psoriasis in accordance with current treatment guidelines (38, 39).

Finally, the high rate of co-morbidities reported here has not been considered in recent cost-of-illness studies (40, 41). A total calculation of the financial impact of psoriasis on the health system needs to include the costs of associated co-morbidities.

A limitation of the data-set is that, due to the lack of further clinical data, we cannot adjust the outcomes for potential confounders such as smoking status or psychosocial factors. However, this limits only the interpretation, not the correctness, of the data.

Taken together, the data reported here confirm the association between psoriasis and diseases related to metabolic syndrome, such as arterial hypertension, hyperlipidaemia, obesity and diabetes. The present investigation also strongly supports the association between psoriasis and systemic chronic inflammatory diseases, such as rheumatoid arthritis, ulcerative colitis and Crohn's disease. These findings should influence the medical care of patients with psoriasis and further underline the importance of an adequate and continuous therapeutic control of psoriasis to reduce morbidity and mortality related to cardiovascular complications. The results of this study should also be included in educational concepts on psoriasis and underline the relevance of an increased awareness among dermatologists of their role as a "gatekeeper" and manager of patients with psoriasis.

Conflicts of interest

This study was supported by research grants from Merck Pharma GmbH, Darmstadt/Germany and from Janssen-Cilag GmbH, Neuss/Germany. M. Augustin, K. Reich and M. Radtke received research funding from Merck Serono and Janssen-Cilag and were invited speakers and consultants for both companies. G. Glaeske and I. Schaefer have no conflicts of interest to declare.

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