Research letter

Diagnostic delay in hidradenitis suppurativa is a global problem*

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Dear Editor, Hidradenitis suppurativa (HS) is clinically defined[1] with recognized diagnostic criteria and recognizable physical characteristics.[2] Untreated, the disease causes significant morbidity.

The prevalence varies between 0·0003% and 4% depending on the study population.[3,4] Estimates from insurance databases suggest a prevalence of < 0·1%.[5,6] This variation strongly suggests a significant selection bias or misclassification, and it may be speculated that not all patients present for care. This is reinforced by clinical experience and published evidence indicating a significant delay in diagnosis.[7] This study explores the delay in diagnosis for patients with HS on an international level.

The study (survey) was conducted in 2013. Observational data were collected during routine visits or extracted from case records. Because of the simple and obvious symptomatology of recurrent painful lesions present in restricted well-defined areas of the body, patients' self-reported history was considered valid regarding onset of symptoms. Consecutive patients with HS and psoriasis were included from each participating centre during a period of 4 months or less.

The data were anonymized by removing any names, addresses and social security numbers, and included age, sex, age at disease onset, age at diagnosis, delay in diagnosis, time from onset of symptoms to first physician contact, age at first medical contact, number of physicians seen prior to the diagnosis, family history and disease severity. If the diagnosis was made by a primary care physician or by a specialist other than a dermatologist prior to seeing a dermatologist, this was recorded as the date of the diagnosis.

Individual centres were responsible for and obtained any locally required permissions and signed informed consent forms, for example ethics committee approval, in accordance with national registry and data protection rules.

Patients diagnosed with HS or psoriasis (and confirmed by the investigator) were included.

The primary outcome was quantification of the delay in diagnosis. Additionally, documentation was made of both the delay in visiting a physician (and so gaining access to specialist treatment) and the relative delay in diagnosis of HS compared with psoriasis with/without a family history.

The severity of HS was determined by Hurley's staging criteria: stage I, mild; stage II, moderate and stage III, severe.[8] In patients with psoriasis, severity was evaluated by the Psoriasis Area and Severity Index: score < 7, mild; 7–12, moderate and > 12, severe.[9]

The t-test, Wilcoxon rank sum test and χ^2-test were used where appropriate. Univariate and multivariate logistic regression analyses were used to identify factors predictive of significant diagnostic delay. Diagnostic delay > 2 years was defined as significant.[10] Diagnosis, sex, age of onset, family history and disease severity were selected as potentially important

Table 1 Characteristics of patients

	Hidradenitis suppurativa	Psoriasis	P-value
Age (years)			
Mean ± SD	36·8 ± 13·1	47·8 ± 16·6	< 0·001
Range	11–72	9–88	
Sex, n (%)			
Female	304 (59)	214 (41)	< 0·001
Male	213 (41)	302 (59)	
Age at disease onset (years)			
Mean ± SD	24·7 ± 11·2	31·1 ± 17·3	< 0·001
Range	4–67	0–85	
Age at diagnosis (years)			
Mean ± SD	31·9 ± 12·2	32·7 ± 17·4	0·42
Range	10–68	0–86	
Delay in diagnosis (years)			
Mean ± SD	7·2 ± 8·7	1·6 ± 4·8	< 0·001
Range	0–47	0–58	
Time from onset of symptoms to first physician contact (years)			
Mean ± SD	2·3 ± 5·0	1·0 ± 4·3	< 0·001
Range	0–41	0–58	
Age at first medical contact (years)			
Mean ± SD	27·0 ± 11·4	32·0 ± 17·5	< 0·001
Range	4–67	0–86	
Number of physicians seen prior to diagnosis			
Mean ± SD	3·9 ± 6·3	1·5 ± 4·3	< 0·001
Range	0–100	0–12	
Family history, n (%)			
Yes	125 (24)	214 (41)	< 0·001
No	387 (75)	293 (57)	
Unknown	5 (1)	9 (2)	
Disease severity, n (%)			
Mild	143 (28)	240 (47)	< 0·001
Moderate	270 (52)	105 (20)	
Severe	104 (20)	165 (32)	
Unknown	0 (0)	6 (1)	

Table 2 Results of the multivariate logistic regression analyses with significant diagnostic delay (> 2 years) as the dependent variable

	Hidradenitis suppurativa		Psoriasis	
Variable	Odds ratio (95% CI)[a]	P-value	Odds ratio (95% CI)[a]	P-value
Sex				
Male	1·00		1·00	
Female	1·87 (1·22–2·87)	0·004	1·08 (0·72–1·61)	0·71
Family history				
No	1·00		1·00	
Yes	1·63 (0·96–2·86)	0·08	1·40 (0·93–2·10)	0·11
Age of onset (per 1-year increment)	0·96 (0·94–0·98)	< 0·001	1·00 (0·99–1·01)	0·90
Disease severity				
Mild	1·00		1·00	
Moderate	2·35 (1·46–3·81)	< 0·001	1·18 (0·70–1·95)	0·52
Severe	1·85 (1·03–3·35)	0·04	0·60 (0·37–0·95)	0·03

CI, confidence interval. [a]Adjusted for sex, family history, age of onset and disease severity.

predictors. A significance level of 0·05 was used for all statistical tests. All analyses were performed in the statistical program R, version 2.15.2 (R Development Core Team, http://www.r-project.org/).

Twenty-nine medical centres (27 tertiary care dermatology centres and two private dermatology clinics) from 24 countries of all continents except Antarctica were included in this study, and contributed 517 patients with HS and 516 with psoriasis. Most of the patients originated from Europe (Belgium, Croatia, Denmark, Ireland, France, Germany, Greece, Italy, Poland, Switzerland, Slovenia, Sweden and the Netherlands; 62%, n = 637), followed by Asia (Japan, Korea, Turkey and Qatar; 11%, n = 118), North America (Canada and U.S.A.; 10%, n = 109), Africa (Egypt and Tunisia; 9%, n = 94), South America (Argentina and Chile; 5%, n = 48) and Australia (3%, n = 27). All patients gave consent to join the study. The patient characteristics are reported in Table 1.

The average patient delay in seeing a physician (the mean time from the onset of symptoms to the first visit with any physician) was 2·3 ± 5·0 years for patients with HS and 1·0 ± 4·3 years for patients with psoriasis (P < 0·001), and the diagnostic delay was 7·2 ± 8·7 years in HS and 1·6 ± 4·8 years in psoriasis (Table 1). In the HS group, 379 patients (73·3%) reported a significant diagnostic delay (> 2 years), vs. 138 patients with psoriasis (26·7%) (P < 0·01). The adjusted odds ratio (OR) in univariate and multivariate logistic regression analyses, with the significant delay (> 2 years) as the dependent variable, was 6·32 for HS vs. psoriasis (P < 0·001).

In the HS group, women and patients with moderate and severe disease were more likely to experience a significant delay (> 2 years) (female vs. male: adjusted OR 1·87, P = 0·004; moderate vs. mild disease: adjusted OR 2·35, P < 0·001; severe vs. mild disease: adjusted OR 1·85, P = 0·04). In contrast, patients with psoriasis with severe disease appeared to have a reduced likelihood of significant diagnostic delay (adjusted OR 0·60, P = 0·03) (Table 2).

This global study indicates that patients with HS have a longer delay in diagnosis than patients with psoriasis. On average, the time from onset of the first symptoms to establishing the diagnosis was 7·2 years, which is comparable with the results of previous smaller studies.[7,11]

Thus we identify delay as a global feature of HS compared with psoriasis. This delay may be caused by patient delay in consulting a physician, the consulted physician not making the correct diagnosis, or both.

The relationship between the clinical severity and duration of delay is influenced by the evolution of the disease. The results show that for HS the longest self-reported delay to treatment occurs in the patients with the most severe disease. This is compatible with the expected evolution of a chronic, progressive course. Additional objective verification of disease severity would be needed to confirm this hypothesis.

Surprisingly, a family history was associated with a longer delay for both diseases. This may indicate a higher threshold for seeking assistance or that the disease is seen as a 'condition of life' in some families.

There are several potential limitations of this study, mainly selection bias (patients from secondary or tertiary referral centres) and reliance on patient history rather than objectively verified symptomatology; for example, many of the Hurley stage I patients may not be aware of their diagnosis.[12]

This study emphasizes the need for education of both patients and healthcare workers in order to make an accurate and early diagnosis, to initiate treatment, to reduce the number of days lost through sickness and to reduce healthcare expenses.

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References

1 Zouboulis CC, Tsatsou F. Hidradenitis suppurative/acne inversa. In: *Fitzpatrick's Dermatology in General Medicine* (Goldsmith LA, Katz SI, Gilchrest BA, Paller AS, Leffell DJ WK, eds), 8th edn. New York, Chicago: McGraw Hill, 2012; 951–9.
2 Jemec GBE. Clinical practice. Hidradenitis suppurativa. *N Engl J Med* 2012; **366**:158–64.
3 Fitzsimmons JS, Guilbert PR, Fitzsimmons EM. Evidence of genetic factors in hidradenitis suppurativa. *Br J Dermatol* 1985; **113**:1–8.
4 Jemec GB. The symptomatology of hidradenitis suppurativa in women. *Br J Dermatol* 1988; **119**:345–50.
5 Vazquez BG, Alikhan A, Weaver AL *et al.* Incidence of hidradenitis suppurativa and associated factors: a population-based study of Olmsted County, Minnesota. *J Invest Dermatol* 2013; **133**:97–103.
6 Cosmatos I, Matcho A, Weinstein R *et al.* Analysis of patient claims data to determine the prevalence of hidradenitis suppurativa in the United States. *J Am Acad Dermatol* 2013; **69**:819.
7 Mebazaa A, Ben Hadid R, Cheikh Rouhou R *et al.* Hidradenitis suppurativa: a disease with male predominance in Tunisia. *Acta Dermatovenerol Alp Pannonica Adriat* 2009; **18**:165–72.
8 Hurley H. Axillary hyperhidrosis, apocrine bromhidrosis, hidradenitits suppurativa, and familial benign pemphigus: surgical approach. In: *Dermatologic Surgery* (Roenigk RRH, ed.), New York: Marcel Dekker, 1989; 729–39.
9 Fredriksson T, Pettersson U. Severe psoriasis – oral therapy with a new retinoid. *Dermatologica* 1978; **157**:238–44.
10 Maza A, Richard MA, Aubin F *et al.* Significant delay in the introduction of systemic treatment of moderate to severe psoriasis: a prospective multicentre observational study in outpatients from hospital dermatology departments in France. *Br J Dermatol* 2012; **167**:643–8.
11 Lamfichekh N, Dupond AS, Destrumelle N *et al.* [Surgical treatment of Verneuil's disease (hidradenitis suppurativa): 15 cases]. *Ann Dermatol Venereol* 2001; **128**:127–9 (in French).

12 Schrader AMR, Deckers IE, van der Zee HH *et al*. Hidradenitis suppurativa: a retrospective study of 846 Dutch patients to identify factors associated with disease severity. *J Am Acad Dermatol* 2014; **71**:460–7.

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