Equity and Outcome Events in Patients with Hidradenitis Suppurativa: Exploring Effect Modifiers Associated with HS Diagnostic Delay

HPR62

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INTRODUCTION

- Hidradenitis Suppurativa (HS) is a chronic inflammatory skin disease characterized by repeated outbreaks of primary lesions, typically inflammatory nodules that progress into abscesses and sinus tracts with subsequent scarring[1].
- Evidence suggests that few patients seek medical help and many experience significant delays between symptom onset and diagnosis. Reasons for delay in diagnosis are not completely understood, with factors including the symptom similarities with other diseases, clinical aspects, access barriers, residing location, and insurance coverage, all potentially influencing a delayed diagnosis. Further research is required to establish the underlying causes[2].
- **This study aims to investigate relationships between effect modifiers and diagnostic delay from the perspective of healthcare system equity.**

METHODS

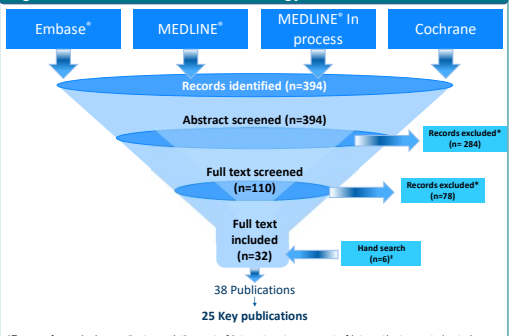
Study design

- The study was a retrospective analysis of the Adelphi HS Disease Specific Program (DSP)™, a real-world point-in-time survey of dermatologists and their consulting HS patients in five European countries (Europe; France, Germany, Italy, Spain, United Kingdom [UK]) and the United States (US) to explore demographic and circumstantial factors contributing to diagnostic delay. Data collection occurred between November 2020 and April 2021.
- The DSP included physician-reported survey data, physician-reported medical record data extraction, and patient-reported data.
- Each physician completed a Patient Record Form for 5–7 consecutively consulting HS patients. This comprised 13 sections, including patient demographics and clinical profile.
- Patients completed a voluntary patient self-completion form documenting burden and disease history, including age of symptom onset.

Patient equity and diagnostic delay

- A targeted literature review identified and summarized published factors directly associated with delayed HS diagnosis including healthcare disparities (Figure 1). Evidence quality analysis was based on the following criteria:
  - Publication type
  - Sample size
  - Study settings
  - Number of publications supporting the evidence
  - Joanna Briggs Institute critical appraisal checklist
  - Statistical significance (*p* value)

Figure 1 – Literature review strategy



*Reason for exclusion: patient population not of interest, outcomes not of interest/not reported, study design not of interest, duplicate, study topic not of interest.
‡ Hand search included searches in relevant dermatological conferences, HS registries, bibliographic search, google search.

Statistical analysis

- Two independent methodologies were used to explore effect modifiers associated with diagnostic delay within the study population.
  1. Univariate Cox proportional hazards models (CPHMs) explored demographic and circumstantial factors contributing to this delay using time from patient reported age of first HS symptoms to physician reported time of HS diagnosis (Table 1).
  2. Multivariate modelling in the form of survival analysis using parametric survival models and reporting of selected variables with the best fit distribution according to the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) also determined effect modifier endpoints associated with time delay (Figures 3-5).
- Date of diagnosis and first consultation were provided by physicians. Age of symptom onset and current age was supplied by the patient.
- For each model analysis, only patients with complete data available for all variables were included.

RESULTS

Literature review

In total, 25 key publications were identified from 394 records that directly determined reasons for delayed HS diagnosis (Figure 1). Factors with varying levels of evidence quality were found to be associated with a delay in HS diagnosis (Figure 2), including ethnicity, smoking status, gender, misdiagnoses, employment and patient embarrassment.

Figure 2 – Factors associated with delay in HS diagnosis

The relative position of effect modifiers do not represent quality or importance of evidence. The closer to the top a factor is positioned, the more evidence available in current literature. HS, hidradenitis suppurativa; BMI, body mass index.

Study population

- Data were collected from 312 dermatologists (US, n=81 [26.0%]; Europe, n=231 [74.0%]) representing a total of 1,787 HS patients (US, n=482 [27.0%]; Europe, n=1,305 [73.0%]).
- In total, 424 patients were included in CPHM analysis based on time from symptom onset to diagnosis. Significant variables (≤ 0.05) associated with delay identified in the model included age at symptom onset, ethnicity, and misdiagnoses (Table 1).

Table 1 – Characteristics associated with diagnostic delay

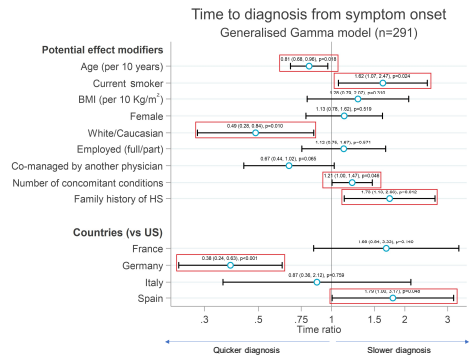
Characteristic	Hazard ratio	p-value
Age at symptom onset	1.017	0.000
Country		
Germany	3.197	0.000
US	1.727	0.005
White/Caucasian	2.089	0.000
Family history of HS	0.691	0.010
Misdiagnosed	0.660	0.000
Draining tunnels at diagnosis	0.702	0.003
Scarring at diagnosis	0.560	0.000
Currently experiencing itching	1.270	0.026
Genitals or pubic region affected	0.637	0.000
Inner thighs affected	0.541	0.000

Hazard Ratio <1 = slower diagnosis, HR >1 = quicker diagnosis. Only patients with complete data available for all variables were included in analysis. US, United States; HS, hidradenitis suppurativa.

Time to diagnosis from symptom onset

- Data from 291 patients were used in multivariate modelling using a generalized gamma model approach to investigate potential effect modifiers of time to diagnosis from symptom onset (Figure 3).
- Quicker diagnosis: older, white/Caucasian, and German patients.
- Slower diagnosis: current smokers, patients with concomitant conditions, a family history of HS and Spanish patients.

Figure 3 – Factors associated with time to diagnosis from symptom onset

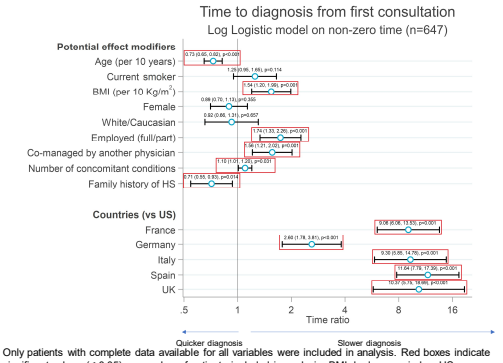


Only patients with complete data available for all variables were included in analysis. Red boxes indicate significant values (≤ 0.05). n, number of patients included in analysis; BMI, body mass index; HS, hidradenitis suppurativa; US, United States. Data displayed as *time ratio, (95% confidence interval), p-value.*

Time to diagnosis from first consultation

- A log logistic model investigated potential effect modifiers of time to diagnosis from first consultation in 647 patients (Figure 4).
- Patients diagnosed on the same day as their first consultation (non-zero time) were excluded from the analysis.
- Quicker diagnosis: older patients, patients with a family history of HS.
- Slower diagnosis: patients with a higher body mass index (BMI), who are employed, co-managed, have concomitant conditions and from Europe.

Figure 4 – Factors associated with time to diagnosis from first consultation

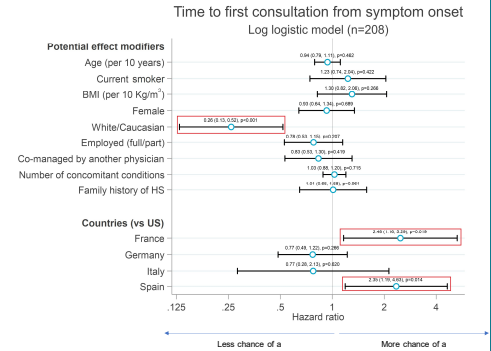


Only patients with complete data available for all variables were included in analysis. Red boxes indicate significant values (≤ 0.05). n, number of patients included in analysis; BMI, body mass index; HS, hidradenitis suppurativa; US, United States. Data displayed as *time ratio, (95% confidence interval), p-value.*

Time to first consultation from symptom onset

- A log logistic model investigated potential effect modifiers of time to first consultation from symptom onset in 208 patients (Figure 5).
- Quicker time to first consultation: white/Caucasian patients.
- Slower time to first consultation: French or Spanish patients.

Figure 5 – Factors associated with time to first consultation from symptom onset



Only patients with complete data available for all variables were included in analysis. Red boxes indicate significant values (≤ 0.05). n, number of patients included in analysis; BMI, body mass index; HS, hidradenitis suppurativa; US, United States. Data displayed as *hazard ratio, (95% confidence interval), p-value.*

LIMITATIONS

- The sample may not be a true representation of the overall HS population as patients who consult more frequently are more likely to be included in the sample.
- The quality of the data may be subject to recall bias, however physicians had access to the patients' medical records when completing the DSP surveys, which were used to provide accurate information.

CONCLUSIONS

- Effect modifiers associated with delayed diagnosis in HS were often consistent between literature and the study analysis and included: BMI, age of HS onset, smoking status, ethnicity, and misdiagnoses. However, the relative impact of specific effect modifiers revealed in the DSP, such as ethnicity, were not commonly reported in existing published evidence.
- Ethnicity is a key driver of delayed consultation, and hence delayed diagnosis, with white/Caucasian patients having a shorter time to first consultation. Actions to support patients from diverse ethnic backgrounds to seek medical care should be implemented.
- Further research is required to enrich these results and investigate the individual contribution of each effect modifier.

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Disclosures

Truman I. and Milligan G. are employed by Adelphi Real World, Bollington, United Kingdom. Modi H. is an employee of Novartis, Hyderabad. Murray N. is an employee of Novartis Business Service Centre, Ireland. Adlard N. is an employee of Novartis Pharma AG, Basel, Switzerland.

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