Research Letter

Hidradenitis suppurativa is associated with iron deficiency anemia, anemia of chronic disease, and sickle cell anemia—A single-center retrospective cohort study

Dear Editors,

What is known about this subject in regard to women and their families?

• Hidradenitis suppurativa is a chronic autoimmune disorder affecting approximately 0.7% to 1.2% of the population, and is most common in black women.

• As per the World Health Organization, the prevalence of anemia in females is more than double the prevalence in males, both globally and in the United States.

• To date, it is unclear what types of anemia are most prevalent in patients with hidradenitis suppurativa, including females, because very few studies have investigated this correlation.

What is new from this article as messages for women and their families?

• Patients with hidradenitis suppurativa, including women, were significantly more likely to have a diagnosis of anemia (odds ratio: 5.99; 95% confidence interval, 5.40–6.65; p < .0001) compared with the overall New York University Langone Health population.

• Among different subtypes of anemia, patients with hidradenitis suppurativa, including women, were significantly more likely to have a diagnosis of iron deficiency anemia, anemia of chronic disease, and sickle cell anemia.

• Hidradenitis suppurativa is more common in black women, and our data call for future studies to include demographic data to further characterize the relationship between hidradenitis suppurativa and anemia.

• Dermatologists should screen all patients with hidradenitis suppurativa, including women, for the anemia subtypes listed above and for every type of anemia until further data are gathered in different populations.

Hidradenitis suppurativa (HS) is a chronic autoimmune disorder affecting approximately 0.7% to 1.2% of the population and is more common in black females (Garg et al., 2018; Ingram et al., 2018). Anemia is associated with HS; however, it is unclear what types of anemia are most prevalent in patients with HS (Ghias et al., 2019; Hoffman et al., 2017; Lee et al., 2020). We sought to define the prevalence of anemia and anemia subtypes in patients with HS at New York University Langone Health (NYULH).

We performed a retrospective cohort study of all medical records for patients seen at NYULH between January 1, 2010 and November 22, 2020, using Epic Slicer Dicer software (Epic, Verona, WI). Patients with HS, anemia, iron deficiency anemia, anemia of chronic disease, folate deficiency anemia, B12 deficiency anemia, sickle cell anemia, and hemolytic anemia were identified through visit diagnosis, billing diagnosis, or having the diagnosis listed on a problem list. The prevalence of anemia and anemia subtypes were compared between patients with HS and all patients without HS at NYULH. Odds ratios (OR), 95% confidence intervals (CIs), and p-values were calculated using MedCalc for Windows, version 19.6 (MedCalc, Ostend, Belgium). The Bonferroni correction was used to adjust for multiple comparisons, and p < .007 was considered statistically significant. NYULH waived institutional review board approval because aggregate data counts were used and patient data were deidentified.

A total of 7,244,243 patients were seen at NYULH during the 10-year study period. A total of 2364 patients with HS were identified, 434 of whom had a diagnosis of anemia (18.36%). Patients with HS were significantly more likely to have a diagnosis of anemia (OR: 5.99; 95% CI, 5.40–6.65; p < .0001) compared with the overall NYULH population (Fig. 1). In particular, patients with HS were significantly more likely to have a diagnosis of iron deficiency anemia (OR: 7.6; 95% CI, 6.61–8.75; p < .0001), anemia of chronic disease (OR: 11.33; 95% CI, 5.88–21.83; p < .0001), and sickle cell anemia (OR: 19.1; 95% CI, 4.75–76.75; p < .0001). Patients with HS did not have a statistically significant increased risk of developing folate deficiency anemia or B12 deficiency anemia. Furthermore, the trend toward a higher prevalence of hemolytic anemia in patients with HS was not statistically significant (Table 1).

Our findings show that patients with HS have 6-fold increased odds of anemia compared with the general population. In particular, they have 7.6-fold increased odds of iron deficiency anemia, 11.3-fold increased odds of anemia of chronic disease, and 19.1-fold increased odds of sickle cell anemia. These data suggest that dermatologists should screen all patients with HS for the subtypes previously listed and for every type of anemia until further data are gathered in different populations. This study is limited by a lack of demographic data, such as age, sex, and race, which is likely a factor in our analysis. Women are more likely than men to have
anemia, and HS is more common in black women. Therefore, future studies including demographic data are required to further characterize the relationship between HS and anemia (Garg et al., 2018; Ingram et al., 2018).

Additionally, our single-center retrospective data may not be generalizable. Anemia is often asymptomatic and may go undiagnosed. Therefore, our data may underestimate true prevalence. Coding and misclassification bias may result in underestimation or overestimation of anemia subtypes. Multicenter studies are required to further clarify prevalence and significance of anemia in patients with HS.

Conflicts of interest: Drs. Parameswaran and Lo Sicco received departmental research funding as co-investigator and principal investigator, respectively, on a phase II Pfizer-funded clinical trial investigating the use of three kinase inhibitors to treat hidradenitis suppurativa. Dr. Lo Sicco received departmental research funding as co-investigator on a Pfizer-funded alopecia areata clinical trial. No other disclosures were reported.

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Study approval

The author(s) confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies.

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Table 1

| Anemia subtype | With HS (n = 2364) | Without HS (n = 7,241,879) | Prevalence in patients with HS | Prevalence in patients without HS | OR† | 95% CI | p-value‡ |
|----------------|-----------------|--------------------------|-------------------------------|----------------------------------|-----|--------|---------|
| Iron deficiency | 216             | 94562                    | 9.14                          | 1.31                             | 7.6 | 6.61–8.75 | < .0001 |
| Chronic disease | 9               | 2442                     | 0.38                          | 0.03                             | 11.3| 5.88–21.83 | < .0001 |
| Folate deficiency | 0             | 63                       | 0                             | 0.0009                           | 24.1| 1.49–389.9 | .025   |
| B12 deficiency  | 0               | 488                      | 0                             | 0.007                            | 3.13| 0.2–50.20 | .42    |
| Sickle cell     | 2               | 321                      | 0.08                          | 0.004                            | 19.1| 4.75–76.75 | < .0001 |
| Hemolytic       | 5               | 4725                     | 0.21                          | 0.07                             | 3.25| 1.35–7.81 | .0086  |
| Anemia (All)    | 434             | 261887                   | 18.36                         | 3.62                             | 5.99| 5.40–6.65 | < .0001 |

HS, hidradenitis suppurativa; OR, odds ratio; CI, confidence interval
† Odds ratio for having an anemia subtype among patients with versus without HS.
‡ With Bonferroni correction for seven multiple comparisons (p < .007 considered statistically significant).

Fig. 1. Odds Ratios for anemia subtypes in patients with HS (n= 2694) and without HS (n= 2,741,8649) using log scale and 95% Confidence Intervals.