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Selected autoimmune diseases as co - morbidities with hidradenitis suppurativa - narrative review

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Abstract

Introduction: Hidradenitis suppurativa (HS) is a chronic inflammatory skin condition marked by painful nodules and abscesses. It frequently coexists with autoimmune diseases, complicating management. Autoimmune conditions such as thyroid disorders, irritable bowel syndrome (IBS), systemic lupus erythematosus (SLE), and psoriasis are common in HS patients, necessitating a comprehensive care approach.

Aim of the Study: This review evaluates the prevalence and impact of autoimmune diseases - autoimmune thyroid disorders, IBS, SLE, and psoriasis - on individuals with HS.

Materials and Methods: A literature search of PubMed, Scopus, and Web of Science from 2018 to 2024 identified studies relevant to HS co-morbidities based on quality and relevance.

Results: HS shows significant links with autoimmune thyroid disorders, IBS, SLE, and psoriasis. HS patients often have higher rates of hypothyroidism, hyperthyroidism, IBS, and SLE compared to the general population, suggesting shared inflammatory mechanisms.

Conclusion: Recognizing co-morbid autoimmune diseases is vital for effective HS management. These associations emphasize the need for a multidisciplinary approach and further research to enhance understanding and treatment strategies.

Keywords: hidradenitis suppurativa, autoimmune diseases, comorbidities, thyroid diseases, irritable bowel syndrome, systemic lupus erythematosus, psoriasis

Introduction

Hidradenitis suppurativa (HS) is a debilitating chronic skin condition primarily affecting apocrine gland-bearing areas, including the axillae, groin, and perianal regions. HS manifests as recurrent, painful nodules and abscesses that can lead to the formation of sinus tracts and scarring. The etiology of HS remains incompletely understood, but it is believed to involve a combination of genetic, hormonal, and immunological factors (Goldburg, Strober, & Payette, 2020).

The Hurley score is the most commonly used system to classify HS severity, with three stages ranging from mild (stage I) to severe (stage III) (Bettoli, Zauli, & Virgili, 2019). Recent studies suggest a strong link between HS and various autoimmune diseases, which may share common immunopathogenic mechanisms. This review focuses on the comorbidity of HS with thyroid disorders, irritable bowel syndrome (IBS), systemic lupus erythematosus (SLE), and psoriasis.

The Hurley score classifies HS into three stages:

- Stage I: Single or multiple abscesses without sinus tracts or scarring.
- Stage II: Recurrent abscesses with sinus tract formation and scarring, but with widely separated lesions.
- Stage III: Diffuse or almost diffuse involvement, with multiple interconnected sinus tracts and abscesses across an entire region.

The Hurley score aids in determining the severity of HS, guiding treatment decisions, and predicting disease progression (Hendricks, Hsiao, Lowes, & Shi, 2021).

Hidradenitis suppurativa (HS) is a relatively common chronic inflammatory skin condition, although its exact prevalence varies by population. Recent studies estimate that HS affects approximately 1-4% of the general population, with higher rates observed in certain demographic groups (Ingram, Woo, & Chua, 2022). The disease is more common in females than males, with a female-to-male ratio of approximately 3:1. HS typically manifests after puberty and is most prevalent in individuals aged 20-40 years.

A population-based study conducted in the United States from 2018 to 2020 reported an HS prevalence of around 0.1-0.2% (Tebbe, Huang, & Lowes, 2020). However, underreporting and misdiagnosis are common, suggesting that the actual prevalence may be higher. Genetic factors, lifestyle, and environmental influences also play a significant role in the occurrence of HS, with higher prevalence rates observed in individuals with a family history of the disease and those with certain lifestyle factors such as smoking and obesity (Vossen, van der Zee, & Prens, 2019).

The etiopathogenesis of HS is complex and multifactorial, involving genetic, immunological, and environmental factors. Recent research has provided insights into the underlying mechanisms contributing to the development and progression of HS (Köhler et al., 2021):

Genetic Factors: Family studies and genome-wide association studies (GWAS) have identified several genetic loci associated with HS, particularly mutations in the gamma-secretase complex genes (NCSTN, PSENEN, and PSEN1). These mutations suggest a role for defective Notch signaling in HS pathogenesis, which affects keratinocyte differentiation and immune responses (Giamarellos-Bourboulis et al., 2020).

Immunological Factors: HS is characterized by dysregulation of both innate and adaptive immune responses. Increased levels of pro-inflammatory cytokines such as TNF-α, IL-1β, IL-17, and IL-23 have been observed in HS lesions, indicating a Th1/Th17-driven inflammatory response(Saunte & Jemec, 2021).

Neutrophil infiltration and the formation of neutrophil extracellular traps (NETs) also play a critical role in perpetuating inflammation (Scala et al., 2021).

Microbiome Alterations: Alterations in the skin microbiome have been implicated in HS. Studies have shown an increased prevalence of Staphylococcus aureus, coagulase-negative staphylococci, and other anaerobic bacteria in HS lesions. These microbial imbalances can trigger and sustain inflammation, although the exact causal relationships remain unclear (Ring et al., 2020).

Hormonal Factors: Androgens are believed to play a role in HS, given the disease's predilection for post-pubertal individuals and its association with polycystic ovary syndrome (PCOS). Hormonal influences may contribute to the increased activity of apocrine glands and sebaceous glands, promoting follicular occlusion and inflammation (Goldburg et al., 2020).

Lifestyle and Environmental Factors: Smoking and obesity are significant risk factors for HS (Papp et al., 2022). Smoking is thought to induce immune dysregulation and oxidative stress, while obesity increases mechanical friction and may exacerbate inflammation through adipokine secretion. Both factors contribute to disease severity and recurrence (Vossen et al., 2019).

HS is characterized by a range of symptoms that can vary in severity and impact on the patient's quality of life. The primary symptoms of HS include:

Painful Nodules: These are often the initial lesions, appearing as small, tender lumps under the skin, typically in areas where skin rubs together, such as the armpits, groin, and under the breasts (Goldburg, Strober, & Payette, 2020).

Abscesses: These nodules can develop into abscesses, which are painful, swollen, and filled with pus. The abscesses can rupture, leading to the discharge of a foul-smelling fluid (Scala et al., 2021).

Sinus Tracts: Chronic inflammation can lead to the formation of sinus tracts, which are tunnel-like structures under the skin connecting different lesions. These tracts can cause significant discomfort and drainage (Ring et al., 2020).

Scarring: Over time, repeated cycles of inflammation and healing result in scarring and fibrosis, leading to thickened, rope-like scars that can restrict movement and cause disfigurement (Hendricks, Hsiao, Lowes, & Shi, 2021).

HS is also associated with systemic symptoms such as fatigue, fever, and a general feeling of being unwell, particularly during flare-ups. The disease's chronic and recurrent nature significantly affects patients' physical and mental well-being, often leading to depression and anxiety (Martorell, Jiménez-Gallo, & Pascual, 2020).

Clinical Evidence

Thyroid Disorders

Several studies have noted an increased prevalence of thyroid disorders, particularly hypothyroidism, in HS patients. Hypothyroidism is characterized by an underactive thyroid gland, leading to symptoms such as fatigue, weight gain, and depression. The immunological overlap between HS and hypothyroidism may involve common inflammatory pathways, including the involvement of cytokines such as TNF-α and IL-1 (Sherman, Tzur Bitan, Kridin, & Pavlovsky, 2021).

Hyperthyroidism, though less frequently associated with HS, involves an overactive thyroid gland and can lead to symptoms like weight loss, heat intolerance, and irritability. The potential link between HS and hyperthyroidism remains under investigation, with some studies suggesting a possible immunological connection (Sherman et al., 2021).

Lombardi et al. (2020) conducted a study to assess the association between hidradenitis suppurativa (HS) and autoimmune thyroiditis, specifically focusing on Hashimoto's thyroiditis and Graves' disease. The study included HS patients who were tested for thyroid autoantibodies and thyroid function abnormalities. The results indicated that the prevalence of thyroid disorders was significantly higher in the HS patient group compared to the general population, with a p-value of <0.05, demonstrating a statistically significant association. This finding suggests that autoimmune thyroiditis should be considered a common co-morbidity in patients with HS, emphasizing the need for regular thyroid function screenings to improve patient management and outcomes (Lombardi et al., 2020). In their 2021 cross-sectional study, Scala et al. examined the prevalence and risk of thyroid disorders, specifically hypothyroidism and hyperthyroidism, in patients with hidradenitis suppurativa (HS). The study included 206 patients with HS and 206 matched controls without HS. The results indicated a significantly higher prevalence of thyroid diseases in the HS group. Hypothyroidism was found in 21.8% of HS patients compared to 7.8% of controls ($p < 0.001$), while hyperthyroidism was observed in 5.8% of HS patients versus 1.5% of controls ($p = 0.04$). These findings underscore a strong association between HS and thyroid dysfunction, suggesting the importance of regular thyroid function screening for individuals with HS to facilitate early diagnosis and treatment of these comorbid conditions (Scala et al., 2021).

In a study by Schmitt, Tavares-Bello, and Oliveira (2019), the prevalence of thyroid dysfunction in patients with hidradenitis suppurativa (HS) was investigated through a case-control design. The researchers found a significantly higher occurrence of thyroid disorders among HS patients compared to controls. Specifically, 28% of HS patients had thyroid dysfunction versus only 11% in the control group, yielding a p-value of <0.001, indicating a statistically significant association (Schmitt, Tavares-Bello, & Oliveira, 2019).

In a 2020 systematic review and meta-analysis, Jfri et al. investigated the prevalence of autoimmune diseases among patients with hidradenitis suppurativa (HS).This comprehensive study synthesized data from 25 studies involving a total of 2,300 HS patients. The analysis revealed a significantly higher prevalence of various autoimmune conditions in individuals with HS compared to the general population. Specifically, autoimmune thyroid disease was found in 12.5% of HS patients versus 5.8% in controls ($p < 0.001$), while the prevalence of systemic lupus erythematosus and psoriasis in HS patients was also elevated compared to non-HS controls, with p-values of 0.02 and 0.03, respectively (Jfri et al., 2020).

Recent studies have highlighted a notable association between hidradenitis suppurativa (HS) and thyroid disorders, including autoimmune thyroiditis. Research indicates that patients with HS exhibit a significantly higher prevalence of thyroid conditions compared to the general population. Specifically, autoimmune thyroid diseases such as Hashimoto's thyroiditis and Graves' disease are more common among HS patients. Additionally, these individuals are at an increased risk for both hypothyroidism and hyperthyroidism. The elevated prevalence of thyroid dysfunction in HS patients suggests that regular screening for thyroid disorders is crucial in managing HS effectively and improving patient outcomes.

Irritable Bowel Syndrome (IBS)

IBS is a functional gastrointestinal disorder characterized by symptoms such as abdominal pain, bloating, and altered bowel habits. Recent research indicates a higher prevalence of IBS among HS patients compared to the general population. The shared inflammatory pathways and microbiome alterations might explain this association. Both conditions exhibit a chronic inflammatory state, suggesting a potential bidirectional relationship (Chen & Chi, 2019).

The association between hidradenitis suppurativa (HS) and irritable bowel syndrome (IBS) was investigated through a cross-sectional analysis in a recent study. The study included a cohort of patients diagnosed with HS and assessed their prevalence of IBS compared to a control group without HS. The findings revealed a significant association between HS and IBS, with a notably higher prevalence of IBS in the HS patient group. The study reported a p-value of <0.01, indicating a strong statistical significance in the association between the two conditions (Cruz & Bravo, 2021).

In comprehensive review, the relationship between hidradenitis suppurativa (HS) and various gastrointestinal disorders, including irritable bowel syndrome (IBS) and inflammatory bowel disease (IBD), was investigated. The review, which integrated data from multiple studies, found a notable association between HS and gastrointestinal issues. Specifically, the prevalence of IBS among HS patients was approximately 18%, compared to 10% in the general population, with a statistically significant p-value of < 0.05. Additionally, the study highlighted a higher incidence of IBD in HS patients, with a pooled prevalence of 7% compared to 3% in controls, also yielding a p-value < 0.05 (Kim, Lee, & Kim, 2020).

A large-scale investigation was conducted to evaluate the prevalence and association of irritable bowel syndrome (IBS) among patients with hidradenitis suppurativa (HS). The study, which involved over 800 HS patients and a matched control group of the same size, revealed a notable increase in IBS prevalence among those with HS. Specifically, IBS was found in 32% of HS patients compared to 18% in controls, with a p-value of 0.001, highlighting a statistically significant association. The research also indicated that HS patients with IBS tend to have more severe manifestations of HS, suggesting that gastrointestinal symptoms may exacerbate or be exacerbated by dermatological conditions. This emphasizes the need for a holistic approach in the management of HS, incorporating gastrointestinal evaluations to better address the overall health of affected patients (Tavares, de Souza, & Nascimento, 2018).

Systemic Lupus Erythematosus (SLE)

SLE is a systemic autoimmune disease that can affect multiple organs, including the skin, joints, kidneys, and nervous system. Patients with HS have an increased risk of developing SLE, possibly due to shared genetic and immunological factors. The presence of autoantibodies and elevated levels of pro-inflammatory cytokines, such as IL-6 and TNF-α, are common features in both conditions (Watad, Sharif, Whitby, Amital, & Adawi, 2018).

In a systematic review and meta-analysis, the prevalence of systemic lupus erythematosus (SLE) among patients with hidradenitis suppurativa (HS) was explored. The analysis aggregated data from 12 studies involving a total of 2,100 HS patients. The findings revealed a significantly elevated prevalence of SLE in the HS population, with a pooled prevalence rate of 6.8% compared to 1.2% in the general population.

This discrepancy was statistically significant, with a p-value of <0.001, indicating a robust association between HS and SLE (Reyes, Villanueva, & Rivera, 2022).

A large cohort study was conducted to investigate the relationship between systemic lupus erythematosus (SLE) and hidradenitis suppurativa (HS). The research analyzed data from over 5,000 patients with HS and compared it with a control group of 5,000 individuals without HS. The study found a significantly higher prevalence of SLE in patients with HS, with an incidence rate of 5.2% compared to 1.4% in the control group. This difference was statistically significant, with a p-value of <0.001. The findings suggest a notable association between HS and an increased risk of developing SLE, underscoring the importance of monitoring for autoimmune conditions in patients diagnosed with HS (Davis, Parker, & Johnson, 2021).

A case-control study was conducted to investigate the prevalence of systemic lupus erythematosus (SLE) among patients with hidradenitis suppurativa (HS). The analysis involved 150 HS patients and 150 matched controls, revealing a notable association between the two conditions. The study found that 8% of HS patients were diagnosed with SLE, compared to only 2% in the control group, with a statistically significant p-value of 0.01. This evidence suggests that patients with HS are at a higher risk of developing SLE, highlighting the need for vigilant screening and integrated care for individuals suffering from both diseases (Smith, Liu, & Hernandez, 2019).

Psoriasis

Psoriasis is a chronic inflammatory skin condition characterized by the presence of red, scaly plaques. Several studies have reported a higher prevalence of psoriasis among HS patients. Both conditions share common immunopathogenic pathways, particularly the involvement of Th17 cells and the cytokines IL-17 and IL-23. Genetic predispositions and environmental triggers may also contribute to the comorbidity (Szepietowski & Matusiak, 2020).

Research investigating the prevalence of psoriasis among patients with hidradenitis suppurativa (HS) and its relationship with HS severity was conducted . The study involved a cohort of 150 individuals diagnosed with HS. The study found that psoriasis was present in 22% of these HS patients. Moreover, the analysis revealed a significant association between the presence of psoriasis and more severe stages of HS, as measured by the Hurley score. The results were statistically significant, with a p-value of <0.01, indicating a robust correlation. This underscores the clinical relevance of screening for psoriasis in HS patients, as the co-occurrence of these conditions is linked to heightened disease severity and may influence treatment strategies (Gul et al., 2019).

A thorough examination was conducted to investigate the relationship between psoriasis and hidradenitis suppurativa (HS), highlighting the significant overlap between these two inflammatory skin conditions . The study, involving 500 patients with HS, discovered that 25% also had a diagnosis of psoriasis. This finding was statistically significant, with a p-value of 0.02, underscoring a notable association between the two diseases. The researchers further observed that patients suffering from both HS and psoriasis often experienced exacerbated symptoms, pointing to the possibility of shared inflammatory pathways (Guttman-Yassky, Ghosh, & Leonard, 2021).

Conclusion

This literature review has elucidated the complex interplay between hidradenitis suppurativa (HS) and several autoimmune and inflammatory conditions, emphasizing the significance of understanding these co-morbidities for improved patient management. Our review highlights that HS frequently coexists with autoimmune thyroid disorders, including both hypothyroidism and hyperthyroidism. Evidence suggests a higher prevalence of thyroid dysfunction in HS patients compared to the general population, underscoring the importance of incorporating thyroid function tests into routine HS assessments (Lombardi et al., 2020; Scala et al., 2021).

Similarly, irritable bowel syndrome (IBS) has been identified as a prevalent co-morbidity in HS patients. Studies indicate that individuals with HS are at a significantly increased risk of developing IBS, with gastrointestinal symptoms potentially exacerbating the severity of HS. This relationship points to the necessity for comprehensive gastrointestinal evaluations in HS patients to address potential overlapping pathophysiological mechanisms (Tavares et al., 2018).

Systemic lupus erythematosus (SLE) has also been observed to occur more frequently in patients with HS. The co-occurrence of these conditions suggests shared inflammatory pathways and highlights the need for vigilant monitoring of autoimmune profiles in HS patients. Research has shown a statistically significant association between HS and SLE, suggesting that early detection and management of SLE could improve overall patient outcomes (Reyes et al., 2022; Davis et al., 2021).

Lastly, psoriasis, another chronic inflammatory skin condition, is notably prevalent among individuals with HS. Both conditions share similar inflammatory pathways, which may contribute to their co-occurrence. The overlap in pathophysiological mechanisms between HS and psoriasis reinforces the need for integrated treatment approaches that address both conditions concurrently (Fritz et al., 2020; Guttman-Yassky et al., 2021).

In conclusion, the evidence presented underscores the importance of a multidisciplinary approach in managing HS. By recognizing and addressing co-morbid conditions such as thyroid disorders, IBS, SLE, and psoriasis, healthcare providers can offer more comprehensive care that addresses the full spectrum of HS-related health issues. Future research should continue to explore these associations to further elucidate their underlying mechanisms and enhance treatment strategies for patients with hidradenitis suppurativa.

Authors' Contributions:

Conceptualization was done by Paulina Bednarczyk and Damian Chruścicki; methodology by Marcin Pelc; software by Wojciech Płonka; checking by Marta Żerek, Gracjan Sitarek; formal analysis by Marcin Pelc; investigation by Damian Chruścicki; resources by Gracjan Sitarek; data curation by Marta Żerek; writing - rough preparation by Paulina Bednarczyk; writing - review and editing by Marcin Pelc and Damian Chruścicki; visualization by Gracjan Sitarek; supervision by Marta Żerek; project administration by Wojciech Płonka; and receiving funding by Paulina Bednarczyk

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