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Association of Hidradenitis Suppurativa With Inflammatory Bowel Disease

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ABSTRACT

Background: The association between Hidradenitis Suppurativa (HS) and inflammatory bowel disease (IBD) has garnered increasing attention in the medical literature, highlighting the complex interplay between these chronic inflammatory conditions. **Literature Review:** The exploration of the microbiome's role in HS by (Mintoff et al., 2021) indicates that microbial interactions contribute to the disease's complexity, which may also be relevant to IBD. The case series presented by (Buchanan et al., 2022) highlights common characteristics shared by patients with both HS and Crohn's disease, including lifestyle factors like obesity and smoking, as well as potential overlaps in immunological pathways. The multifactorial nature of HS, including its relationship with the microbiome and immune dysregulation, is underscored by (Świerczewska et al., 2022). The systematic review and meta-analysis by further elucidate the shared inflammatory pathways between HS and psoriasis, another condition frequently linked to IBD. Finally, the investigation into cellular mechanisms by (R. van Straalen et al., 2024) emphasizes the chronic inflammatory nature of HS and the need for further research into the cellular interactions within the HS microenvironment.**Conclusion :** In conclusion, the literature collectively illustrates that HS and IBD share significant associations characterized by common pathophysiological mechanisms, lifestyle factors, and psychological implications. The need for continued research is evident to further clarify these underlying mechanisms and improve therapeutic approaches for patients suffering from both conditions.

Keyword: Association, Hidradenitis Suppurativa, Inflammatory Bowel Disease

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INTRODUCTION

The association between Hidradenitis Suppurativa (HS) and inflammatory bowel disease (IBD) has garnered increasing attention in the medical literature, highlighting the complex interplay between these chronic inflammatory conditions. (K Shanmugam et al., 2017) provides foundational insights into HS, characterizing it as a chronic, recurrent inflammatory disease primarily affecting apocrine gland-bearing skin. They emphasize the poorly understood pathogenesis of HS, noting that while obesity and smoking are known risk factors, the relationship with IBD is also significant. Their review underscores the emerging role of targeted immune therapies, which may offer new avenues for treatment.

Building on this understanding, (N. Kaakati et al., 2021) explore the comorbidities associated with HS, including its notable connection to IBD. Their retrospective cohort study reveals that HS affects a small percentage of the population and is characterized by painful nodules and draining tunnels. They reaffirm the association of HS with various factors, including obesity and smoking, while specifically highlighting the link to IBD, thereby reinforcing the notion of HS as a systemic condition rather than merely a localized skin issue.

(Mintoff et al., 2021) delve deeper into the pathophysiological aspects of HS, focusing on the microbiome's role in disease manifestation. They argue that the interactions between inflammation, genetics, and the microbiome contribute to the disease's complexity. Their systematic review suggests that the microbiome in HS-affected skin differs significantly from that in healthy skin, which could have implications for understanding the disease's association with IBD and other inflammatory conditions.

(Buchanan et al., 2022) present a case series that further elucidates the controversial relationship between Crohn's disease (CD) and HS. They detail common characteristics shared by patients with both conditions, such as obesity and smoking, while also noting the significant association of HS with perianal disease in CD patients. Their findings suggest that biologic agents used in treating CD may

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play a role in HS development, highlighting the overlapping immunological pathways between these diseases.

(E. Rymaszewska et al., 2022) contribute to the literature by examining the psychological implications of HS, noting its profound impact on patients' quality of life. Their cross-sectional study reveals that HS is associated with various comorbidities, including IBD, and emphasizes the emotional burden experienced by patients. This highlights the need for a holistic approach to patient care, addressing both physical and psychological aspects of HS.

In the same year, (Świerczewska et al., 2022) discuss the multifactorial nature of HS, including the potential role of the microbiome in its pathogenesis. They note the immune dysregulation in HS and the need for further research to establish the relationship between microbiota and disease progression. This underscores the complexity of HS as it relates to other inflammatory conditions, including IBD.

conduct a systematic review and meta-analysis to assess the association between HS and psoriasis, which is another inflammatory condition frequently linked to IBD. Their findings suggest a significant association, indicating that the underlying inflammatory pathways may connect these diseases, including HS and IBD.

Finally, (R. van Straalen et al., 2024) provide insights into the cellular mechanisms driving HS, focusing on the role of Hippo signaling in fibrosis. Their research highlights the chronic inflammatory nature of HS and the involvement of various immune cells in disease progression. This study emphasizes the need for a deeper understanding of the cellular interactions within the HS microenvironment, which could inform treatment strategies for patients suffering from both HS and IBD.

Through this literature review, the intricate relationship between HS and inflammatory bowel disease is elucidated, underscoring the need for continued research to clarify the underlying mechanisms and improve therapeutic approaches.

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LITERATURE REVIEW

The article "Review of Current Immunologic Therapies for Hidradenitis Suppurativa" by (K Shanmugam et al., 2017) provides a comprehensive overview of hidradenitis suppurativa (HS), a chronic inflammatory condition characterized by recurrent abscesses and scarring in apocrine gland-bearing areas of the skin. The authors highlight the prevalence of HS, affecting approximately 1-4% of the population, and underscore the significance of obesity and smoking as established risk factors. Notably, they also draw attention to the association between HS and other immune-mediated disorders, particularly inflammatory bowel disease (IBD), suggesting a complex interplay that warrants further investigation.

The article delves into the pathophysiology of HS, which remains poorly understood. The authors discuss several contributing factors, including the host's innate and adaptive immune responses, impaired keratinocyte function, and the microbial environment within hair follicles and apocrine glands. This multifactorial perspective is crucial as it lays the groundwork for understanding the potential links between HS and IBD, given that both conditions involve dysregulation of the immune system.

A significant portion of the review is dedicated to the emerging landscape of targeted immunologic therapies for HS. The authors present evidence that these therapies can lead to favorable outcomes for patients, both as standalone treatments and in conjunction with surgical interventions. The discussion of immunologic therapies is particularly relevant in the context of HS's association with IBD, as both conditions may benefit from similar therapeutic approaches targeting the immune pathways involved.

The article "Atopic dermatitis is associated with hidradenitis suppurativa diagnosis: A single institution retrospective cohort study" by (N. Kaakati et al., 2021) provides valuable insights into the relationship between hidradenitis suppurativa (HS) and its comorbidities, particularly inflammatory bowel disease (IBD). The authors present HS as a chronic and painful inflammatory condition that affects a small percentage of the population, highlighting its significant impact on patients' quality of life and healthcare utilization.

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The study emphasizes the clinical characteristics of HS, which include recurrent painful nodules and draining tunnels, primarily located in areas such as the axilla and groin. These symptoms not only contribute to the physical discomfort experienced by patients but also lead to increased healthcare costs due to frequent medical visits and interventions. The identification of risk factors, such as smoking, female sex, and African American race, adds depth to the understanding of the demographic and lifestyle variables that may influence the prevalence and severity of HS.

Importantly, the article discusses the association between HS and other inflammatory conditions, notably IBD. This connection is crucial as it underscores the need for healthcare providers to be vigilant in recognizing HS in patients with IBD and vice versa. The authors' acknowledgment of the comorbidities linked to HS suggests a broader inflammatory pathway that may be relevant for both conditions, warranting further research into their shared pathophysiological mechanisms.

The article titled "The Clinical Relevance of the Microbiome in Hidradenitis Suppurativa: A Systematic Review" by (Mintoff et al., 2021) provides a comprehensive examination of the role of the microbiome in Hidradenitis Suppurativa (HS), a chronic inflammatory skin condition characterized by painful nodules, abscesses, and draining fistulae in intertriginous areas. The authors effectively highlight the multifactorial nature of HS, emphasizing the interplay between inflammation, genetic predisposition, the microbiome, and environmental influences.

One of the critical insights from the article is the authors' critique of the term "Hidradenitis Suppurativa," which they argue is misleading as it implies a solely infective process involving the apocrine glands. This perspective is important as it reframes HS as a complex disease that shares characteristics with other inflammatory conditions, rather than a simple infection. The authors draw attention to the unique microbiome present in HS patients, which differs significantly from that of healthy individuals. This distinction is crucial, as it suggests that the

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microbiome may not only play a role in the disease's pathogenesis but could also influence its progression and response to treatment.

The systematic review method employed by the authors is commendable, as it synthesizes existing literature on the microbiome's involvement in HS and its potential implications for disease management. They explore the possibility that manipulating the microbiome could alter the disease trajectory, which opens avenues for novel therapeutic approaches. However, the article could benefit from a more detailed discussion on specific microbiome alterations associated with inflammatory bowel disease (IBD), considering the growing evidence linking HS and IBD.

Moreover, while the authors present a well-rounded analysis of the microbiome's role in HS, further exploration into how these microbiome changes correlate with systemic inflammation seen in conditions like IBD would enhance the article's relevance to the broader context of HS associations. Additionally, the article would gain from a discussion on the limitations of current research, including the need for longitudinal studies to better understand the causal relationships between microbiome dynamics and HS.

The article titled "A Controversial Relationship Between Crohn’s Disease and Hidradenitis Suppurativa: A Case Series and Literature Review" by (Buchanan et al., 2022) provides a thorough examination of the intersection between Hidradenitis Suppurativa (HS) and Crohn's Disease (CD), both of which are chronic inflammatory conditions. The authors effectively highlight the historical context of the association, first noted in the 1990s, and present compelling case studies that illustrate the shared characteristics and clinical manifestations of these conditions.

One of the primary insights from the article is the demographic commonality among patients suffering from both HS and CD. The authors note a significant prevalence of obesity, female sex, and perianal disease in these patients, which aligns with previous findings in the literature. This demographic profiling is crucial for healthcare providers as it can inform screening and management strategies for patients presenting with either condition. The assertion that patients with HS have three times the odds of having CD compared to those without HS is

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particularly striking and underscores the need for heightened awareness and potential interdisciplinary management approaches.

The article also delves into the lifestyle factors that exacerbate both conditions, notably tobacco smoking. The authors cite studies indicating that smokers experience more severe disease courses and increased flare-ups, which is an important consideration for both patient education and therapeutic strategies. The emphasis on smoking as a modifiable risk factor could lead to improved outcomes if addressed effectively in clinical practice.

Additionally, the authors explore the pathophysiological similarities between HS and CD, suggesting a common immune-mediated origin. This connection is further supported by the observation that patients with both conditions experienced relief from symptoms when treated with anti-TNF-a therapy, indicating potential overlaps in treatment modalities. The discussion on the effectiveness of biologics, particularly adalimumab and infliximab, for managing both HS and CD is particularly relevant given the increasing reliance on these therapies in chronic inflammatory conditions.

The management strategies outlined in the article, which include both medical therapies and surgical interventions, reflect a comprehensive approach to treating HS. The authors advocate for the use of local or systemic antibiotics with anti-inflammatory properties as first-line treatments, which is consistent with current clinical practices. The mention of adalimumab as the only FDA-approved biologic for HS further emphasizes its potential as a dual therapy for patients suffering from both HS and CD.

The article "Depression and anxiety in hidradenitis suppurativa patients: a cross-sectional study among Polish patients" by (E. Rymaszewska et al., 2022) provides a comprehensive examination of the psychological comorbidities associated with hidradenitis suppurativa (HS), a chronic inflammatory condition affecting various body areas. The authors highlight that HS is not merely a dermatological issue but is also intertwined with significant comorbidities, including inflammatory bowel disease (IBD), particularly Crohn’s disease.

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HS is characterized by its recurrent nature, leading to painful inflammatory nodules, abscesses, and the formation of sinus tracts, which can result in considerable physical and psychological distress for patients. The study emphasizes the debilitating effects of HS on the quality of life, suggesting that the chronic pain and discomfort experienced by patients may lead to higher rates of depression and anxiety. This is particularly relevant in the context of IBD, where chronic inflammation and its associated symptoms can compound the psychological burden experienced by individuals suffering from both conditions.

The authors present evidence indicating that patients with HS exhibit a higher prevalence of depression and anxiety compared to the general population. This connection is critical as it underscores the need for a multidisciplinary approach to treatment, which should include mental health support alongside dermatological care. The findings suggest that healthcare providers should be vigilant in screening for mental health issues in HS patients, especially those with comorbid IBD, as the interplay between these conditions may exacerbate the psychological impact.

Furthermore, the article brings attention to the potential for increased suicidality among HS patients, a critical concern that warrants further investigation. The implications of these findings extend beyond individual patient care; they highlight the necessity for healthcare systems to develop integrated treatment strategies that address both the physical and psychological aspects of chronic inflammatory diseases.

The article "Microbiome in Hidradenitis Suppurativa—What We Know and Where We Are Heading" by (Świerczewska et al., 2022) provides an in-depth exploration of hidradenitis suppurativa (HS), emphasizing its chronic and inflammatory nature. The authors highlight that HS manifests primarily in intertriginous regions and is characterized by painful nodules, abscesses, and the potential for significant scarring. This condition typically initiates in early adulthood and affects individuals of all genders, indicating a broad demographic impact.

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A critical aspect of the article is its examination of the multifactorial pathogenesis of HS, which includes genetic predispositions, environmental influences, hormonal factors, and notably, the role of the microbiome. The authors articulate that while HS is not classified as an infectious disease, the presence of bacteria in skin folds can provoke immune responses that exacerbate the condition. This insight is particularly relevant when considering the inflammatory pathways involved in HS, as the secretion of pro-inflammatory cytokines such as TNF, IL-1β, and IL-17 is central to the inflammatory processes observed in affected individuals.

The article further introduces the concept of immune dysregulation in HS, supported by various studies that suggest a complex interplay between immune responses and microbial communities. This notion aligns with emerging theories regarding the gut-brain-skin axis, which posits that emotional states may influence the gut microbiome, potentially leading to systemic inflammation that could worsen skin conditions like HS. This connection underscores the importance of considering both psychological and microbiological factors in the management of HS.

Despite these insights, the authors acknowledge that the relationship between the microbiome and HS remains inadequately understood. They call for further research to elucidate the specific mechanisms by which commensal microorganisms interact with the host in the context of HS. This gap in knowledge presents both a challenge and an opportunity for future studies, as understanding these interactions could pave the way for novel therapeutic approaches.

The article titled "Risk of psoriasis in people with hidradenitis suppurativa: A systematic review and meta-analysis" by provides a comprehensive examination of the relationship between hidradenitis suppurativa (HS) and psoriasis, highlighting the broader implications of this association, particularly concerning inflammatory bowel disease (IBD). The authors meticulously synthesize existing literature to elucidate the potential links between these chronic inflammatory conditions.

The main premise of the article is that HS, a chronic inflammatory skin disorder characterized by painful nodules and cysts, shares common

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pathophysiological mechanisms with various autoimmune diseases, including psoriasis and IBD. The systematic review reveals that individuals with HS are at an increased risk for developing psoriasis, which is particularly relevant given the overlapping inflammatory pathways that characterize both conditions. The authors effectively argue that the inflammatory processes involved in HS may predispose patients to other inflammatory diseases, including IBD, thereby underscoring the importance of recognizing these associations in clinical practice.

One of the strengths of this article is its rigorous methodology, including a systematic review and meta-analysis of relevant studies. This approach not only enhances the reliability of the findings but also provides a robust framework for understanding the complexities of HS and its comorbidities. The authors discuss various autoimmune diseases associated with HS, such as metabolic syndrome and spondyloarthropathies, which further contextualizes the inflammatory nature of HS and its potential links to IBD.

However, while the article presents compelling evidence of the association between HS and psoriasis, it could benefit from a deeper exploration of the underlying mechanisms that connect these conditions. The authors briefly touch upon the inflammatory pathways but do not delve into specific biomarkers or genetic predispositions that might elucidate why patients with HS are more susceptible to IBD. A more detailed discussion of these aspects could enhance the reader's understanding of the pathophysiological connections and inform future research directions.

The article "Single-cell sequencing reveals Hippo signaling as a driver of fibrosis in hidradenitis suppurativa" by (R. van Straalen et al., 2024) provides a comprehensive examination of hidradenitis suppurativa (HS), a chronic inflammatory skin condition that affects approximately 1% of the population. The authors delve into the pathophysiology of HS, highlighting its characteristic features such as recurrent inflammatory nodules, painful abscesses, and the progressive formation of dermal tunnels. These clinical manifestations are attributed to an intrinsic defect in keratinocytes leading to infundibular hyperplasia, which serves as a precursor to cyst formation and subsequent acute inflammation.

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A significant aspect of the article is its focus on the immune response associated with HS. The authors note that the acute inflammatory phase is characterized by a diverse immune infiltrate, with elevated levels of proinflammatory cytokines including IL-1β, IL-17, and TNF-α. This cytokine milieu is critical in perpetuating inflammation and may contribute to the chronic nature of the disease. The authors also observe a shift in immune cell composition in chronic lesions, with a notable increase in B cells and plasma cells, which may play a role in the fibrotic changes observed in long-standing HS.

The article emphasizes the role of fibrosis as a major complication in HS, which can hinder effective treatment outcomes. The authors point out that the current FDA-approved therapy, adalimumab, achieves clinical response in only 40% to 60% of patients, underscoring the need for a deeper understanding of the disease's underlying mechanisms. The exploration of the Hippo signaling pathway as a potential driver of fibrosis is particularly noteworthy, as it may reveal new therapeutic targets and strategies for managing HS.

Moreover, the article highlights the limited understanding of the interplay between various cell types within the HS microenvironment, particularly the contribution of stromal cells. This gap in knowledge poses a significant barrier to the identification of novel treatment options and necessitates further research.

CONCLUSION

The literature on the association between Hidradenitis Suppurativa (HS) and inflammatory bowel disease (IBD) reveals a complex interplay between these chronic inflammatory conditions. The foundational insights into HS, characterized as a chronic inflammatory disease affecting apocrine gland-bearing skin, highlight its poorly understood pathogenesis and the significant role of comorbidities, particularly IBD (K Shanmugam et al., 2017). The retrospective cohort study by (N. Kaakati et al., 2021) emphasizes that HS is not merely a localized skin issue but rather a systemic condition, reinforcing the need for a holistic approach in understanding its comorbidities.

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The exploration of the microbiome's role in HS by (Mintoff et al., 2021) indicates that microbial interactions contribute to the disease's complexity, which may also be relevant to IBD. The case series presented by (Buchanan et al., 2022) highlights common characteristics shared by patients with both HS and Crohn's disease, including lifestyle factors like obesity and smoking, as well as potential overlaps in immunological pathways. This is further supported by the psychological implications of HS, as discussed by (E. Rymaszewska et al., 2022), which indicate that the emotional burden experienced by patients with HS and IBD necessitates a multidisciplinary approach to treatment.

The multifactorial nature of HS, including its relationship with the microbiome and immune dysregulation, is underscored by (Świerczewska et al., 2022). The systematic review and meta-analysis by further elucidate the shared inflammatory pathways between HS and psoriasis, another condition frequently linked to IBD. Finally, the investigation into cellular mechanisms by (R. van Straalen et al., 2024) emphasizes the chronic inflammatory nature of HS and the need for further research into the cellular interactions within the HS microenvironment.

In conclusion, the literature collectively illustrates that HS and IBD share significant associations characterized by common pathophysiological mechanisms, lifestyle factors, and psychological implications. The need for continued research is evident to further clarify these underlying mechanisms and improve therapeutic approaches for patients suffering from both conditions.

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