

Hidradenitis suppurativa and Type 2 Diabetes: A Case Report

Andhuvan Gandhi^{1,*}, Naveen Gunasekaran², Kaviya Ganesamoorthy², Megha Mary Tomson¹, Reshma Raju¹, Shabana Abdulkhader¹

¹Department of Pharmacy Practice, College of Pharmacy, Sri Ramakrishna Institute of Paramedical Sciences, Coimbatore, Tamil Nadu, INDIA.

²Department of Pharmacy Practice, PSG College of Pharmacy, Coimbatore, Tamil Nadu, INDIA.

ABSTRACT

Hidradenitis suppurativa (HS) is a chronic inflammatory skin condition characterized by lesions and abscesses associated with the apocrine gland. Suggested pathogenesis for the disease development include genetic mutations, impaired immunoregulation, and lifestyle factors. Strong associations with obesity and significant improvement in HS severity with weight loss have been reported in various literatures. A sequence of inflammatory events begins with the disruption of follicular epithelium leading to a huge immune response. Patients also become vulnerable to secondary bacterial infections. Diabetes due to its close relation with obesity, and anemia are commonly observed co-morbidities accompanying HS. Available treatment options include antibiotics, pain-relievers and biological therapy. This case report focusses on a 28 year old male admitted with typical symptoms of HS. The physical presentation and thorough

blood work led to the diagnosis of HS and Type 2 diabetes mellitus (T2DM). Wound care and treatment with antibiotic combination, adalimumab and metformin showed to be effective.

Key words: Adjuvant therapy, Anemia, Hidradenitis suppurativa, Obesity, T2DM, Wound care.

Correspondence

Dr. Gandhi Andhuvan, M.Pharm, Ph.D

Assistant Professor, Department of Pharmacy Practice, College of Pharmacy SRIPMS, Coimbatore-641044, Tamil Nadu, INDIA.

Email id: andhuvangandhi@gmail.com

DOI: 10.5530/jyp.2021.13.103

INTRODUCTION

Hidradenitis suppurativa is a chronic inflammation that affects areas of the skin that have apocrine glands and is distinguished by recurrent, inflamed abscesses and nodules. This can progressively rupture leading to mucopurulent discharge and scar formation. HS also known as acne inversa or Verneuil's disease can have a negative impact on patient's quality of life. These painful outbreaks generally appear after puberty, most commonly in the armpits, groin, gluteal and anogenital area.¹ The prevalence of HS globally ranges from less than 1% to 4%. Women are reportedly more susceptible than men, with a ratio of about 3:1.²

Various pathogenic processes proposed for the disease development are genetic mutations, immune dysregulation and lifestyle factors, such as smoking and obesity.³ These can lead to inflammation surrounding the terminal hair follicles, infundibular hyperkeratosis, follicular occlusion and subsequent rupture. A huge immune response is activated involving proinflammatory cytokines, certain mediators of activated T helper cells and neutrophilic granulocytes, macrophages and plasma cells.⁴ There is also a risk of secondary bacterial infection in the later stages of HS which can worsen the scarring and sinus track formation.⁵

The treatment primarily focusses on controlling pain, resolution of wounds and fistulas and prevention of further recurrences or worsening of the condition. Patients are provided with adjuvant therapy such as weight loss, smoking cessation, brace dressing and management of secondary infections.⁶

For superficial papules and pustules, topical antibiotic clindamycin is found effective. In severe stages, systematic treatment with combinations of clindamycin and rifampicin, or ertapenem followed by combination rifampicin, moxifloxacin and metronidazole for 6 months is recommended.⁷ Recently, biological therapy with adalimumab or infliximab has gained popularity for moderate-severe HS.⁸ Further studies with significant sample size are needed to validate this approach and other treatment modalities. We herein report a case of HS with Type 2 Diabetes Mellitus (T2DM) in a 28 year old male patient.

CASE REPORT

A 28-year-old male patient was admitted in the Dermatology department with major complaints of recurrent nodules and pustules over the lower abdomen, groin and axilla. He had been on insulin therapy for 6 years after being misdiagnosed with type 1 diabetes (diagnosed outside).

In 2014, the patient developed a swelling in the buttocks region which gradually increased in size over a period of 4 years. Later, it ruptured with pus and blood discharge for which he was treated with T. Linezolid 600 mg for 10 days in a local clinic and the purulent discharge ceased leaving no scars. He continued the medication (Linezolid 600 mg 10 days per month) for next 2 years without any prescription. Meanwhile, on advice of a traditional medicine practitioner, he underwent native treatment discontinuing insulin therapy for past 2 months.

The patient on admission was found to be obese (Body Mass Index (BMI) – 30.9 kg/m² Obese Class 1) and cutaneous examination revealed multiple diffuse hyper-pigmented nodules, ulcer and discharging sinus over the axilla, lower abdomen, groin and scrotum. His lab investigations revealed elevated blood sugar (Post Prandial Blood Sugar [PPBS] 189 mg/dl), Erythrocyte Sedimentation Rate (ESR) 59 mm/hr, C-peptide 17.30 ng/ml and White Blood Cell (WBC) 17.5 × 10³ cells/cu.mm. Decreased levels of Hemoglobin (Hb) 10.5 g/dl, Mean corpuscular volume (MCV) 69.9fl, Mean Corpuscular Hemoglobin Concentration (MCHC) 31.5g/dl, Packed Cell Volume (PCV) 33.3% and Mean Corpuscular Hemoglobin (MCH) 22.1 pg were also noted. The abnormal C-peptide indicated increased insulin production and resistance which led to the re-evaluation of his Type 1 Diabetes Mellitus (T1DM) history. Further, Hemoglobin A1c (HbA1c) was found to be 6.7% and Random Blood Sugar (RBS) readings on three consecutive days were elevated.

Mantoux test was negative. Wound swab culture and direct smear of pus cells showed the presence of Gram negative rods (*Proteus mirabilis*) and scanty appearance of Gram positive cocci. Culture sensitivity test

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

revealed that *Proteus mirabilis* is sensitive to cefipime and cefoperazone + sulbactams.

Based on the physical presentation and lab investigations, the patient was diagnosed with HS and Type 2 DM. During the hospital stay, the patient was administered Inj. Taxim (Cefotaxime) 1g IV BD for 7 days and T. Ofloxacin 400mg BD for 3 days to treat the bacterial infection, Inj. Adalimumab 160 mg S/C(4 injections each 40 mg) as a first-line biological treatment for HS, T. Signoflam SOS (Acetofenac, Acetaminophen and Serratiopeptidase) for pain relief and T. Metformin 500mg BD for T2DM. Brevoxyl (Benzoyl peroxide) wash was done on the affected regions. The patient's condition improved during the course of the hospital stay and was discharged after a week.

DISCUSSION

Several studies report positive association between HS and obesity as observed in this patient. Follicular hyper keratinization caused by abrasion within skin folds is regarded to be the cause for HS breakout.⁹ Kromann *et al.* in his study, reported a higher prevalence of the disease among obese patients and adequate weight loss contributed to alleviate the disease severity.¹⁰

Diabetes is a common co-morbid condition seen alongside HS. The plausible mechanism is indirectly linked to obesity causing insulin resistance, making patients susceptible to DM.¹¹ Moreover diabetes reportedly increases the intensity of HS, as estimated by the Hurley staging used to determine the disease severity.¹² Metformin, the first-line treatment for DM, reportedly has beneficial effects on HS and obesity. Anti-inflammatory properties of the drug by reducing the secretion of several inflammatory mediators (mainly Tumor necrosis factor alpha (TNF α) and Interleukin 17(IL-17)) and its agonist action on Adenosine Monophosphate Kinase (AMPK) (regulatory enzyme for glucose and lipid metabolism) makes it effective in both the conditions respectively.¹³ HS is a chronic inflammatory condition which can ultimately affect the renal release of erythropoietin and decrease intestinal iron absorption due to TNF- α production. Hence, anemia is a major complication of HS as observed from the above patient's hematology reports although untreated.¹⁴

Lifestyle modifications are important in HS where pharmacists' contributions are crucial. Patients should be advised on smoking cessation, weight loss if obese, use of gentle cleansers and importance of wearing loose-fitting clothes to prevent friction. Deodorant usage and shaving over the affected regions must be avoided to prevent further worsening of lesions. Dietary changes such as switching to paleo or anti-inflammatory diets, reducing sugars and dairy consumption have shown appreciable improvement in disease severity.¹⁵

CONCLUSION

Hidradenitis suppurativa is a rarely reported skin condition with a negative psychological impact leading to underreporting and longer delays in diagnosis among Indian population. Obesity and tobacco smoking are commonly reported etiologies. Better awareness regarding the disease, strict adherence to therapy and lifestyle modifications to control its progression is warranted.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ABBREVIATIONS

HS: Hidradenitis suppurativa; **T2DM:** Type 2 Diabetes Mellitus; **BMI:** Body Mass Index; **PPBS:** Post Prandial Blood Sugar; **ESR:** Erythrocyte Sedimentation Rate; **WBC:** White Blood Cell; **Hb:** Haemoglobin; **MCV:** Mean corpuscular volume; **MCHC:** Mean Corpuscular Hemoglobin Concentration; **PCV:** Packed Cell Volume; **MCH:** Mean Corpuscular Hemoglobin; **T1DM:** Type 1 Diabetes Mellitus; **HbA1c:** Glycated Haemoglobin; **RBS:** Random Blood Sugar; **DM:** Diabetes Mellitus; **TNF α :** Tumor necrosis factor alpha; **IL-17:** Interleukin 17; **AMPK:** Adenosine Monophosphate Kinase; **IV:** Intravenous; **S/C:** Subcutaneous; **BD:** bis in die; **SOS:** Si Opus Sit.

REFERENCES

1. Nguyen TV, Damiani G, Orenstein LAV, Hamzavi I, Jemec GB. Hidradenitis suppurativa: An update on epidemiology, phenotypes, diagnosis, pathogenesis, comorbidities and quality of life. *J Eur Acad Dermatol Venereol.* 2021;35(1):50-61. doi: 10.1111/jdv.16677, PMID 32460374.
2. Ballard K, Shuman VL. Hidradenitis suppurativa. *Stat Pearls [Internet].* Updated 2021 Aug 11:2021.
3. Hoffman LK, Ghias MH, Lowes MA. Pathophysiology of hidradenitis suppurativa. *Semin Cutan Med Surg.* 2017;36(2):47-54. doi: 10.12788/j.sder.2017.017, PMID 28538743.
4. Wolk K, Join-Lambert O, Sabat R. Aetiology and pathogenesis of hidradenitis suppurativa. *Br J Dermatol.* 2020;183(6):999-1010. doi: 10.1111/bjd.19556, PMID 33048349.
5. Seyed Jafari SM, Hunger RE, Schlapbach C. Hidradenitis suppurativa: Current understanding of pathogenic mechanisms and suggestion for treatment algorithm. *Front Med.* 2020;7:68. doi: 10.3389/fmed.2020.00068.
6. Gulliver W, Zouboulis CC, Prens E, Jemec GB, Tzellos T. Evidence-based approach to the treatment of hidradenitis suppurativa/acne inversa, based on the European guidelines for hidradenitis suppurativa. *Rev Endocr Metab Disord.* 2016;17(3):343-51. doi: 10.1007/s11154-016-9328-5, PMID 26831295.
7. Saunte DML, Jemec GBE. Hidradenitis suppurativa: Advances in diagnosis and treatment. *JAMA.* 2017;318(20):2019-32. doi: 10.1001/jama.2017.16691, PMID 29183082.
8. Rosales Santillan M, Morss PC, Porter ML, Kimball AB. Biologic therapies for the treatment of hidradenitis suppurativa. *Expert Opin Biol Ther.* 2020;20(6):621-33. doi: 10.1080/14712598.2020.1732918, PMID 32077334.
9. Balgobind A, Finelt N, Strunk A, Garg A. Association between obesity and hidradenitis suppurativa among children and adolescents: A population-based analysis in the United States. *J Am Acad Dermatol.* 2020;82(2):502-4. doi: 10.1016/j.jaad.2019.08.034, PMID 31442534.
10. Kromann CB, Ibler KS, Kristiansen VB, Jemec GB. The influence of body weight on the prevalence and severity of hidradenitis suppurativa. *Acta Derm Venereol.* 2014;94(5):553-7. doi: 10.2340/00015555-1800, PMID 24577555.
11. Bui TL, Silva-Hirschberg C, Torres J, Armstrong AW. Hidradenitis suppurativa and diabetes mellitus: A systematic review and meta-analysis. *J Am Acad Dermatol.* 2018;78(2):395-402. doi: 10.1016/j.jaad.2017.08.042, PMID 29056237.
12. Bettoli V, Naldi L, Cazzaniga S, Zauli S, Atzori L, Borghi A, *et al.* Overweight, diabetes and disease duration influence clinical severity in hidradenitis suppurativa-acne inversa: evidence from the national Italian registry. *Br J Dermatol.* 2016;174(1):195-7. doi: 10.1111/bjd.13864, PMID 25913460.
13. Jennings L, Hambly R, Hughes R, Moriarty B, Kirby B. Metformin use in hidradenitis suppurativa. *J Dermatol Treat.* 2020;31(3):261-3. doi: 10.1080/09546634.2019.1592100.
14. Deckers IE, Van der Zee HH, Prens EP. Severe fatigue based on anaemia in patients with hidradenitis suppurativa: Report of two cases and a review of the literature. *J Eur Acad Dermatol Venereol.* 2016;30(1):174-5. doi: 10.1111/jdv.12680, PMID 25185839.
15. Macklis PC, Tyler K, Kaffenberger J, Kwatra S, Kaffenberger BH. Lifestyle modifications associated with symptom improvement in hidradenitis suppurativa patients. *Arch Dermatol Res.* 2021;23:1-8.

Article History: Received: 22-09-2021; Revised: 04-10-2021; Accepted: 23-10-2021.

Cite this article: Andhuvan G, Naveen RNG, Kaviya G, Tomson MM, Raju R, Shabana A. Hidradenitis Suppurativa and Type 2 Diabetes: A Case Report. *J Young Pharm.* 2021;13(4):434-5.