

Treatment Regime of Acne Vulgaris - Psychological Consequences: A Case ReportZahra bt Zaki^{1*}, Tivyapprasanthni A/P Manivasagam², Tan Ying Qi³, Ling Yi Lin⁴, Ong Kah Keat⁵¹Hospital Umum Sarawak²Hospital Seberang Jaya³Hospital Pulau Pinang⁴W Clinic, Butterworth⁵IG Clinic, Butterworth**Abstract**

Acne vulgaris is a common dermatology disorder affecting adolescent with potential for profound psychosocial morbidity. There is high prevalence rate of depression and anxiety among patients with acne. In this case, an 18-year-old gentleman diagnosed to have acne vulgaris with the severity of CASS 4 was initially treated with isotretinoin. Unfortunately, post initiation of isotretinoin, he suffered from depressive symptoms that resulted in early termination of isotretinoin. Although he was able to recover from his depressive symptoms after the termination of isotretinoin, he was unable to tolerate topical benzoyl peroxide (BPO) 5% and had to be admitted for intravenous antibiotics and steroid. Therefore, despite isotretinoin being the most efficacious in treatment of severe acne, conflicting results of its association with depression still require more controlled trials to clarify. In this case, it is highlighted that even a low dose isotretinoin might cause significant psychological impact that warranted more caution in treatment of acne.

Keywords: Acne vulgaris, Depression, Isotretinoin*Address of corresponding author:**Hospital Umum Sarawak Email:**zakizahra94@yahoo.com**Received: January 2, 2023**Revision received: March 17, 2023**Accepted after revision: March 20, 2023**www.japa-edu.org*

Acne vulgaris is an inflammatory disorder of the pilosebaceous unit, which is self-limiting but runs a chronic course. It is known to be caused by follicular epidermal hyperproliferation, excess sebum production, the presence of the commensal bacteria *Propionibacterium acnes* and inflammation [1]. Acne vulgaris is triggered by *P. acnes* in adolescence, under the influence of normal circulating dehydroepiandrosterone (DHEA) [2]. It usually presents with inflammatory and non-inflammatory lesions primarily on the face but may also occur on the upper arms, trunk and back [3-5]. There are many approaches and treatments for acne vulgaris. This case report focuses on a young gentleman who presented with severe acne vulgaris CASS 4 and was initially treated with Oral Isotretinoin. However, his overall condition worsened and subsequently required admission to the hospital for further management.

Case Presentation

This is a case of an 18-year-old gentleman who was diagnosed with severe acne vulgaris CASS 4 (Figure 1) and has been under Dermatology Clinic follow up since early September 2022. He first presented with acneiform eruption with pustules and nodules requiring the initiation of oral isotretinoin 20 mg EOD. After 2 doses of isotretinoin, he began to develop low mood and loss of appetite which was suggestive of depressive symptoms. He noted that those symptoms improved with cessation of the medication for two days. However, his skin lesions worsened with worsening pustule formation as well as swelling over his acne nodules and these were associated with severe pain (PS: 9/10). He was unable to tolerate topical benzoyl peroxide (BPO) 5% due to the burning sensation. On examination, there was multiple pustular cystic lesion and inflamed papules over face and trunk (CASS 5). His blood investigation showed high white blood cells count (WBC: 22).

Management and outcome

This patient was then admitted to the hospital

and was started on intravenous (IV) Hydrocortisone 50 mg, IV Cefuroxime 750 mg, and normal saline dabs three times daily for each treatment. After a few days on antibiotics, his symptoms improved and his white blood cell count was reduced in trend. Subsequently, he was discharged with Tab Doxycycline 100mg once daily till present. His overall condition improved from CASS 5 to CASS 3.

Discussion

Acne vulgaris is a prevalent dermatological problem nationally and it undoubtedly affects the patient cosmetically, psychologically, and socially [6]. Acne may appear in adolescence and persists through the early thirties. The Global Burden of Disease Project estimates the prevalence of acne at 9.4%, ranking it as the eighth most prevalent disease worldwide with higher rates reported in developed countries [6-8]. It is more common in males than in females and studies have shown that urban population are more affected than the rural population. About 20% of the affected individuals develop severe acne, which results in scarring. Some races appear to be more affected than others for example Asians and Africans tend to develop severe acne, but mild acne is more common in the white population. Research in the US has shown that 85% of people between the ages of 12 and 24 years have acne, and while it is most common in teenagers, acne affects 8% of adults aged 25 to 34 years, and 3% of adults aged 35 to 44 years [6].

There are several factors that leads to the formation of acne. Firstly, during puberty there is increased production of sebum regulated by androgens. High level of androgens may cause overstimulation of sebaceous glands and subsequently increased hyperproliferation of follicular epidermis, hence there is retention of sebum. The glands may also be stimulated from hypersensitivity of the normal level androgens which are testosterone, dehydro-



Figure 1A, 1B, 1C: Photographic image: Day 1 before started on treatment.

epiandrosterone sulfate (DHEAS) and dihydrotestosterone (DHT). Secondly, overproduction of normal pilosebaceous flora, *P. acne* may lead to inflammation of the glands. *P. acne* releases enzymes such as proteinase, lipases and hyaluronidases that causes the breakdown of sebum to free fatty acids, peptides and chemotactic factors which are integral to inflammatory cascade. The inflammatory response to the bacterium and metabolic by-products leads to the formation of papules, pustules, and nodules. Moreover, altered follicular keratinisation causes accumulation of cells and sebum which leads to the formation of microcomedones (microscopic precursor of acne lesion) [9].

This patient was started on oral isotretinoin in view of his initial presentation of CASS 4 (numerous pustules and papule with few nodules and cyst). Isotretinoin is highly effective for treatment of acne. It is an isomer of the active form of vitamin A and retinoids. It acts on the sebaceous gland by decreasing the size thus reduces sebum production. Apart from that, it normalizes follicular keratinization and indirectly inhibits *P. Acnes* growth in hair follicle and exerts an anti-inflammatory action. Basically, it inhibits formation of acne from every aspect of pathophysiology. Oral isotretinoin usually started with 0.5-1mg/kg/day with average maximum 1.2 mg/kg/day. Incidence of relapse is higher in patient started on low dose of isotretinoin. On the other hand,

rate of relapsed is lower for patient that have cumulative dosage of 120mg/kg. On average, patient will have remission for period of 38 months after completed one course.

However, the patient of interest started to develop the side effect - low mood and loss of appetite. Based on studies, there was no clear relationship between use of isotretinoin and depression. However, in a small number of patients it may be associated with symptoms of major depressive episode. In these group of patients, their symptoms will resolve rapidly (within a week) once the medication is discontinued however some may persist. Based on a study by Bremner⁷, there is evidence that isotretinoin alters brain function and it is consistent with depression and mood changes via direct imaging studies. Apart from physiological complication, isotretinoin commonly causes dry mucosa, xerosis with pruritus, cheilitis and elevated liver function test.

After that, topical benzoyl peroxide (BPO) 5% treatment was given to the patient. However, the patient was unable to tolerate it due to the burning sensation cause by the treatment. BPO is an anti-bactericidal, keratolytic and anti-inflammatory agent available in various concentrations includes 2.5%, 5% and 10%. Patient will develop adverse effect with the use of BPO in 10% concentration.

In view of his worsening condition with signs of inflammation and increase in white blood cell parameter, he was admitted and started on IV hydrocortisone and cefuroxime. Subsequently, oral Tab Doxycycline 100 mg OD was given to the patient. Oral antibiotics have been widely used for moderate to severe acne vulgaris as they have anti-*P. acne* properties which prevents further inflammation. Oral antibiotics should not be prescribed continuously for more than 6 months as prolonged use may be associated with bacterial resistance [10].

Furthermore, some aesthetic procedures could also be helpful for this patient. Chemical peels include glycolic acid and salicylic acid have desquamating properties which reduces corneocyte cohesion and keratinocyte plugging, which act as adjuvant in treatment of facial acne [10]. Phototherapy including pulsed dye laser, potassium titanic phosphate (KTP) laser, infrared diode laser, intense pulse light (IPL) and visible light sources, and photodynamic therapy leads to photo thermal heating of sebaceous glands and photochemical inactivation of *P. acnes*, may be used as an alternative therapeutic option for patients who fail or unable to tolerate other standard acne therapies [10].

Conclusion

In conclusion, treatment for acne vulgaris can be divided into topical and systemic. Topical treatments are mainly suitable for mild to moderate acne. In the case of severe acne, isotretinoin may be superior in comparison to other drugs. However, it is not suitable for every patient due to the adverse effects. Further clinical studies are required to establish the relationship between isotretinoin and depressive symptoms. For patient with moderate to severe acne, the treatment should start with oral antibiotics to prevent further inflammation.

References

1. Thiboutot D, Gollnick H, Bettoli V, Dréno B, Kang S, Leyden JJ, Shalita AR, Lozada VT, Berson D, Finlay A, Goh CL. New insights into the management of acne: an update from the Global Alliance to Improve Outcomes in Acne group. *Journal of the American Academy of Dermatology*. 2009 May 1;60(5): S1-50.
2. Goulden V, McGeown CH, Cunliffe WJ. The familial risk of adult acne: a comparison between first-degree relatives of affected and unaffected individuals. *British Journal of Dermatology*. 1999 Aug 1;141(2):297-300.
3. Yan HM, Zhao HJ, Guo DY, Zhu PQ, Zhang CL, Jiang W. Gut microbiota alterations in moderate to severe acne vulgaris patients. *The Journal of Dermatology*. 2018 Oct;45(10):1166-1171.
4. Juhl CR, Bergholdt HK, Miller IM, Jemec GB, Kanters JK, Ellervik C. Dairy intake and acne vulgaris: a systematic review and meta-analysis of 78,529 children, adolescents, and young adults. *Nutrients*. 2018 Aug 9;10(8):1049.
5. George RM, Sridharan R. Factors aggravating or precipitating acne in Indian adults: a hospital-based study of 110 cases. *Indian Journal of Dermatology*. 2018 Jul;63(4): 328-331.
6. Barbieri JS, Fulton R, Neergaard R, Nelson MN, Barg FK, Margolis DJ. Patient perspectives on the lived experience of acne and its treatment among adult women with acne: a qualitative study. *JAMA Dermatology*. 2021 Sep 1;157(9):1040-1046.
7. Bremner JD. Isotretinoin and neuropsychiatric side effects: continued vigilance is needed. *Journal of Affective Disorders Reports*. 2021 Dec 1; 6:100230.
8. Lynn DD, Umari T, Dunnick CA, Dellavalle RP. The epidemiology of acne vulgaris in late adolescence. *Adolescent health, medicine and therapeutics*. 2016 Jan 19:13-25.
9. Sutaria AH, Masood S, Schlessinger J. Acne vulgaris. In: *StatPearls* [Internet]. 2022 Aug 1. StatPearls Publishing.
10. Clinical Practice Guidelines: Management of Acne. January 2012.