International Journal of Women's Dermatology xxx (2017) xxx–xxx

Contents lists available at ScienceDirect

International Journal of Women's Dermatology

A review of diagnosis and treatment of acne in adult female patients☆,☆☆

A.U. Tan, MD *, B.J. Schlosser, MD, PhD, A.S. Paller, MD

Northwestern University, Department of Dermatology, Chicago, IL

ARTICLE INFO

Article history:
Received 3 January 2017
Received in revised form 11 October 2017
Accepted 11 October 2017
Available online xxxx

ABSTRACT

This review focuses on the treatment options for adult female patients with acne. Acne in adult female patients may start during adolescence and persist or have an onset in adulthood. Acne has various psychosocial effects that impact patients' quality of life. Treatment of acne in adult women specifically has its challenges due to the considerations of patient preferences, pregnancy, and lactation. Treatments vary widely and treatment should be tailored specifically for each individual woman. We review conventional therapies with high levels of evidence, additional treatments with support from cohort studies and case reports, complementary and/or alternative therapies, and new agents under development for the treatment of patients with acne.

Contents

☆ Sources of support: LaRoche-Posay generously covered the publication costs for this article but did not otherwise affect the content or draft the manuscript.
☆☆ Conflicts of interest: The authors have no conflicts of interest to declare.
* Corresponding author.
E-mail address: ainah.tan@northwestern.edu (A.U. Tan).

https://doi.org/10.1016/j.ijwd.2017.10.006

Please cite this article as: Tan AU, et al, A review of diagnosis and treatment of acne in adult female patients, International Journal of Women's Dermatology (2017), https://doi.org/10.1016/j.ijwd.2017.10.006

Introduction

Acne vulgaris (AV) is a disease of the pilosebaceous unit that causes noninflammatory lesions (open and closed comedones), inflammatory lesions (papules, pustules, and nodules), and varying degrees of scarring. AV is an extremely common condition with a lifetime prevalence of approximately 85% and occurs mostly during adolescence (Bhate and Williams, 2013). AV can persist into adulthood, with a 50.9% prevalence rate of acne in women ages 20 to 29 years versus 26.3% in women ages 40 to 49 years (Collier et al., 2008). Female patients account for two thirds of visits made to dermatologists for acne, and one third of all dermatology office visits for acne are by women who are older than 25 years (Yentzer et al., 2010).

Acne leads to significant morbidity that is associated with residual scarring and psychological disturbances such as poor self-image, depression, and anxiety, which leads to a negative impact on quality of life (Cunliffe, 1986; Ramos-e-Silva et al., 2015; Shuster et al., 1978). In one epidemiologic study by Yentzer et al. (2010), 8.8% of patients with acne reported depression with women suffering from depression twice as often as men (10.6% vs. 5.3%), but this was unrelated to acne severity.

Pathogenesis

Four key pathogenic processes lead to the formation of acne lesions: alteration of follicular keratinization that leads to comedones; increased and altered sebum production under androgen control; follicular colonization by *Propionibacterium acnes*; and complex inflammatory mechanisms that involve both innate and acquired immunity (Williams et al., 2012; Zaenglein et al., 2016). Genetics (twin studies Bataille et al., 2002, family history of severe acne Wei et al., 2010), diet (glycemic index Ismail et al., 2012; Kwon et al., 2012; Smith et al., 2007a, 2007b, 2008), including chocolate (Grant and Anderson, 1965; Magin et al., 2005) and dairy consumption (Adebamowo et al., 2006, 2008; Di Landro et al., 2012); and environmental factors (smoking Klaz et al., 2006; Schafer et al., 2001, occlusive cosmetics Plewig et al., 1970, occupational exposures Tucker, 1983) also contribute to the pathogenesis of acne.

The pathogenesis of acne in adult women is particularly complex. Androgens play a major role (Harper, 2008; Lucky et al., 1994, 1997), as evidenced by the response of acne in adult women to hormonal treatments, especially in the context of hyperandrogenism disorders such as polycystic ovary syndrome (PCOS) and the use of hormone-based therapies such as oral contraceptive and antiandrogen medications in women with normal androgen levels (Lolis et al., 2009). In addition, the lack of acne in androgen-insensitive women (Imperato-McGinley et al., 1993; Thiboutot, 2004) and rising levels of dehydroepiandrosterone sulfate in association with the onset of acne in premenarchal girls and a subset of patients with PCOS also play a major role (Lucky et al., 1994; Chen et al., 2011). Androgens stimulate sebum production via androgen receptors on the sebaceous glands.

Clinical presentation

Acne in women can occur at any age and with varying degrees of severity. Female patients may more frequently develop lesions on the lower third of the face, especially on the chin and jawline (Kamangar and Shinkai, 2012). However, a more recent epidemiologic study by Dreno et al. (2015) suggests that this hormonal distribution may not be the most common clinical presentation of acne in adult women.

Acne lesions range from comedones (Fig. 1) to papules and pustules (Fig. 2), cysts, and/or nodules (Fig. 3). In one study of postadolescent acne, 85% of patients had mostly comedonal acne (Capitanio et al., 2010) with two subtypes identified as persistent and late-onset acne (Ramos-e-Silva et al., 2015). Persistent acne, which is defined as acne that persists beyond adolescence into adulthood, accounts for 80% of cases in adult female patients (Holzmann and Shakery, 2014). Late-onset acne is defined as acne that begins after

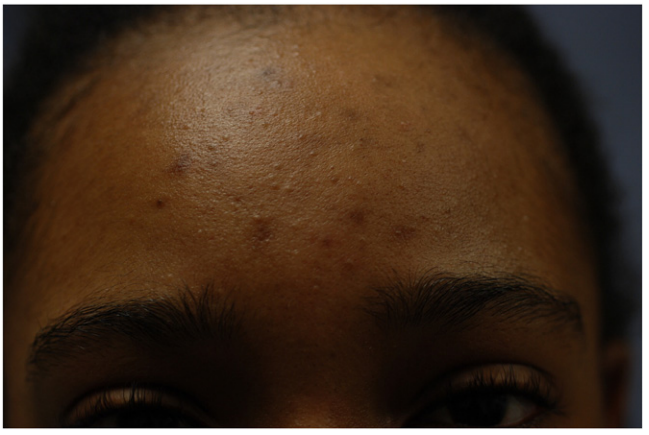

Figure 1. Comedones with post-inflammatory hyperpigmentation. Courtesy of Bethanee Schlosser, MD, PhD.

Please cite this article as: Tan AU, et al, A review of diagnosis and treatment of acne in adult female patients, International Journal of Women's Dermatology (2017), https://doi.org/10.1016/j.ijwd.2017.10.006