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Treatment of gestational acne

Ana Laura Stadtlander de Faria[1], Nila Toledo da Silva[2], Rafaella Tavares Dumoulin[3], Rossana Cantanhede Farias de Vasconcelos[4]

[1-4]Universidade Santo Amaro, Unisa

ABSTRACT

OBJECTIVE

To analyze safe and effective therapeutic options for the treatment of gestational acne, highlighting the efficacy, safety, and potential risks of each option, with emphasis on non-teratogenic alternatives.

METHODS

An integrative literature review was conducted, analyzing scientific publications from 2016 to 2024. The search was performed in the PubMed, SciELO, ScienceDirect, and Google Scholar databases using the descriptors "gestational acne," "acne treatment," and "acne and lactation," combined with Boolean operators (AND and OR). Clinical studies and reviews addressing topical, oral, and dermatological procedures related to gestational acne were included. Studies in animals, duplicates, or those lacking relevant clinical data were excluded.

RESULTS

The findings suggest that although some treatment options, such as dermocosmetics, have a high safety margin, in more severe cases of acne vulgaris, systemic therapy with oral medications may be required. However, many conventional drugs, such as oral retinoids and certain antibiotics, pose a risk of fetal malformations and are therefore contraindicated during pregnancy. Other alternatives have been studied as substitutes for conventional treatments. Topical therapies, light and laser use, chemical peels, and microdermabrasion have shown promising effectiveness as interventions for gestational acne.

CONCLUSION

Each intervention option is addressed with a focus on its effectiveness and safety in pregnant women. It is evident that the treatment of gestational acne should be carefully planned and individualized, involving an interdisciplinary approach to ensure both effective and safe outcomes for the mother and the fetus.

KEYWORDS

Acne; Pregnancy; Treatment; Remedy; Dermocosmetics.

Corresponding author
Ana Laura Stadtlander de Faria
Universidade Santo Amaro
Rua Professor Eneias de Siqueira Neto, 340. Jardim das Imbuias, São Paulo/SP, Brasil
E-mail: laurastadtlander@gmail.com
Orcid: https://www.orcid.org/0009-0004-4770-0714

DOI:

INTRODUCTION

Acne vulgaris is a chronic inflammatory disease of the pilosebaceous unit, affecting up to 85% of adolescents and approximately 12% of adults, with a higher prevalence in females.[1,2] Its distribution is global, being more common in urban and industrialized populations, and it may persist or emerge at different stages of life, including during pregnancy.[2,3] During pregnancy, physiological hormonal changes — primarily increased androgens, progesterone, and stimulation of sebaceous production — contribute to the onset or worsening of acne vulgaris, referred to as gestational acne.[3,4] The prevalence of this condition ranges from 20% to 40% of pregnant women, with the highest incidence in the first and second trimesters, when hormonal fluctuation is greatest.[2,5]

The main pathophysiological mechanism involves androgenic stimulation of the sebaceous glands, which increases sebum production and promotes follicular obstruction, creating an environment conducive to the proliferation of Cutibacterium acnes, resulting in local inflammation, comedone formation, and inflammatory papules.[5] Treatment of this condition during pregnancy is challenging due to the contraindication of several effective topical and systemic therapeutic agents for acne vulgaris — such as oral retinoids and antibiotics — which are known teratogens and are contraindicated during pregnancy.[5] Medical societies such as the American Academy of Dermatology and the American College of Obstetricians and Gynecologists recommend azelaic acid and benzoyl peroxide as safe topical therapies, both considered low-risk medications throughout all trimesters.[6,7] Topical antibiotics, such as erythromycin and clindamycin, are frequently combined with benzoyl peroxide to minimize bacterial resistance.[4,6] In moderate-to-severe cases, oral antibiotics such as erythromycin and cefalexin may be used for short periods. However, oral retinoids are absolutely contraindicated due to their confirmed teratogenic risk. In addition to pharmacological therapies, techniques such as microdermabrasion (which promotes superficial removal of keratin and dead cells), superficial chemical peels with glycolic or mandelic acid, LED light therapy for bacterial and inflammatory reduction via photobiomodulation, and low- intensity laser for sebum control and scar stimulation have been used as complementary techniques for mild-to-moderate acne management.[7,8]

Given this context, numerous substances have been explored, including topical treatments, oral antibiotics, and, in more severe cases, systemic interventions. Despite the high prevalence — estimated at 20% to 40% of pregnant women, with greater incidence in the first two trimesters — there is a scarcity of well-established guidelines on the treatment of gestational acne, highlighting the need for further research in this area. This literature review analyzes the available therapeutic options for the treatment of gestational acne, highlighting their efficacy, safety, and potential risks, with emphasis on alternatives that do not pose a fetal risk.[8]

METHODS

This study consists of an integrative bibliographic review, taking into account the theme of gestational acne treatment. The review was completed based on scientific articles published in academic and peer-reviewed journals that addressed topical, systemic, and dermatological procedure therapies applied during pregnancy.

For the preparation of this work, electronic and physical books from national and international literature were used, as well as scientific articles collected from databases including: PubMed, SciELO, Google Scholar, and ScienceDirect. To identify the articles, search terms such as "gestational acne," "acne treatment," "acne and lactation," and their variations were applied, combined with Boolean operators such as "AND" and "OR," to maximize search sensitivity. Selection criteria were applied that included publications available between the years 2016 and 2024.

Inclusion criteria comprised clinical studies, reviews, and case reports in humans that presented therapeutic outcomes in pregnant women. Exclusion criteria included duplicate articles, reviews without a clinical basis, experimental studies in animals, and studies without maternal-fetal safety data. After initial screening, 47 articles were identified. Of these, 34 articles met the criteria and were included in the analysis. Studies were assessed according to study design, sample size, statistical methods, bias control, and adverse event reporting. Evidence was compared and synthesized descriptively, highlighting the main findings on safety and efficacy of treatments during pregnancy.

RESULTS AND DISCUSSION

The majority of studies consisted of narrative and systematic reviews, followed by clinical studies, case reports, and institutional guidelines and documents. The included works primarily addressed topical, oral, and dermatological procedure therapies aimed at the treatment of gestational acne, with emphasis on assessing efficacy, safety, and potential risks to the pregnant woman and fetus. Table 1 summarizes the main pharmacological options, their respective FDA categories, and clinical recommendations by gestational trimester, according to recent studies.

Table 1 - Therapeutic options by trimester of pregnancy

Drug	FDA Category	1st Trimester	2st Trimester	3st Trimester	Clinical notes
Azelaic acid	B	✓	✓	✓	Safe in all trimesters; first-line option.
Benzoyl peroxide	C	✓	✓	✓	Minimal absorption; safe with limited topical use.
Salicylic/glycolic acid	-	✓	✓	✓	Avoid use over large areas.
Topical clindamycin	B	✓	✓	✓	Prefer formulations combined with benzoyl peroxide; safe.
Erythromycin (oral/topical)	B	X	✓	✓	Avoid estolate form; prefer base or ethylsuccinate.
Tetracyclines (doxycycline, minocycline)	D	✓	X	X	Contraindicated after 15 weeks.
Isotretinoin and other systemic retinoids	X	X	X	X	Absolutely contraindicated; highly teratogenic.
Sulfamethoxazole/ Trimethoprim	C/D	X	✓	X	Avoid in 1st and 3rd trimester; may be used with caution in 2nd trimester.

Source: Murase et al. 2014[5]; Ly et al. 2023[9]; Chien et al. 2016[10]; Briggs et al. 2022[11]; Hale 2023[12]

Given the gestational acne scenario, the choice of treatment requires a judicious approach that balances clinical efficacy and safety profile.[1,2] Therefore, the main therapeutic strategies available for its management will be discussed, with emphasis on evidence-based options applicable to clinical practice, including topical, systemic, physical, and cosmetic approaches.[3,5] The use of azelaic acid and benzoyl peroxide is widely accepted as first-line therapy for gestational acne[6,9] while topical and oral antibiotics are options in moderate cases.[5,9,13] However, bacterial resistance and the limited efficacy of these approaches reinforce the need for therapeutic alternatives.[14,15]

Dermocosmetics with botanical active ingredients are emerging as promising options, since compounds such as green tea polyphenols, licorice extract, and Centella asiatica exhibit

anti-inflammatory and antimicrobial properties.[13,16-18] Although their benefits are evident in pre-clinical studies and in the general population, specific investigations in pregnant women are still needed.[7,13] Laser and LED light therapies are emerging as safe and effective alternatives, especially blue light phototherapy, which reduces the population of Cutibacterium acnes without systemic risk.[13,14,16,19] Superficial peels and radiofrequency microneedling can complement treatment by reducing oiliness and improving skin texture without causing significant adverse effects.[13]

Based on this therapeutic overview and individually analyzing these strategies — highlighting their mechanisms of action, safety profile during pregnancy, clinical efficacy, and available evidence in the literature — certain principles stand out.[1,13] Azelaic acid is a common topical active ingredient for acne treatment, both during pregnancy and in non-pregnant patients, and is also applicable in males.[13,15] Only a small percentage is absorbed through the skin (approximately 4 to 8% of the drug), which contributes to its excellent safety profile.[9,13] It exhibits anti-inflammatory, antioxidant, and comedolytic properties. Several advantages have been described, especially for inflammatory and non-inflammatory acne vulgaris, as well as for treating rosacea, perioral dermatitis, and post-inflammatory hyperpigmentation.[13] This antimicrobial agent has a well-documented safety profile throughout all three gestational trimesters and subsequently during lactation.[9,15]

Topical benzoyl peroxide is a drug with broad antibacterial, comedolytic, and keratolytic action, and it does not develop drug resistance[9]. When used at a maximum concentration of 5%, restricted to twice daily, it provides great benefit for acne therapy at all stages of pregnancy[9]. No research has reported teratogenic effects, due to the low systemic absorption and rapid renal excretion of the active ingredient.[9] Combined use of azelaic acid and benzoyl peroxide is accepted.[5,9]

The antibiotics most commonly used for acne control are clindamycin and erythromycin, both available in systemic and topical formulations.[20] The mechanism of action of these drugs is based on reducing the local inflammatory response (through inhibition of neutrophil migration, cytokine production, and macrophage activity) and by reducing the activity of bacterial lipases, consequently altering the ratio between fatty acids and triglycerides.[9,20] In pregnant women, topical formulations are preferable since they have lower systemic absorption, while oral use should be restricted to short periods.[9] Overall, these agents are considered safe, with no increase in teratogenic events or relevant obstetric complications.[9,20]

Among natural alternatives, green tea — obtained from the leaves of the Camellia sinensis plant — contains several polyphenolic compounds, mainly catechins, which confer antioxidant, anti-inflammatory, and antimicrobial properties against Cutibacterium acnes[21]. Its antioxidant action is related to free radical scavenging and inhibition of lipid peroxidation, while its antimicrobial activity occurs through inhibition of fatty acid synthesis and bacterial enzymatic activity, as well as reduction of sebum production via inhibition of 5α-reductase. Studies demonstrate that green tea has minimal adverse effects and significantly reduces acne vulgaris lesions.[17,21]

Although specific studies are still limited, the use of botanical active ingredients is growing. Centella asiatica is widely known for stimulating collagen production and promoting wound healing, and also exhibits anti-inflammatory effects through inhibition of pro-inflammatory cytokines, fibroblast activation, and free radical neutralization.[18] Additionally, its topical use has demonstrated significant improvement in skin texture and reduction of erythema, making it a valuable aid in recovery after an acne lesion. Licorice extract contains glycyrrhizin, licochalcone A, and glabridin. Licochalcone A inhibits the COX-2 enzyme, reduces sebum production, and exhibits antimicrobial action by damaging the bacterial cell membrane.[22,23] Tea tree oil also has antimicrobial, anti-inflammatory, and antifungal effects, and is capable of reducing inflammatory papules and pustules without significant systemic effects.[20,24,25]

Hops contain xanthohumol, a compound with antibacterial, anti-inflammatory, and antioxidant activity. It also contains phytoestrogens, such as 8-prenylnaringenin, which modulate androgen action on the skin, reducing sebaceous hyperactivity — one of the mechanisms of acne.[26,27] Although the topical use of herbal substances is a growing trend, the number of studies and clinical trials involving pregnant women remains very limited, reinforcing the need for more research in this population.

LED light is a promising, safe, and non-invasive alternative for the treatment of acne vulgaris. There is clinical evidence that, at low intensity, it is a safe and effective option for treating acne through its anti-inflammatory action and mitochondrial ATP formation. The process of light absorption by the skin, known as photobiomodulation (PBM)[19], helps reduce oxidative stress, thereby reducing inflammation.[19,28] In blue light phototherapy, a lower irradiance level is used, yet it still produces effective acne improvement, with minor or even no adverse reactions compared to conventional therapy.[16,28] PBM acts by activating photobiological pathways in the skin, irradiating Cutibacterium acnes through photoexcitation of bacterial porphyrins, which produces singlet oxygen and causes bacterial destruction.[28,29] Studies show clinical evidence of significant improvement after short treatment cycles, with no systemic risks to the pregnant patient.[16]

Radiofrequency (RF) microneedling reduces acne-induced inflammation through the thermal heat source generated, which helps reduce papule volume.[29,30] RF also contributes to the regulation of the sebaceous glands, modulating their activity with an intervention directed at the gland level.[29,31,32] It is worth noting that for each patient, the RF parameters must be optimized — modulated by administration time, intensity, and needle size used in the process — forming an adequate ablative zone for the lesion.[29,32] It is therefore considered a safe approach, although specific studies in pregnant women are still lacking.

Superficial chemical peels can be performed with various dermocosmetics, the most common being the salicylic acid (SA) peel and the glycolic acid (GA) peel. GA is an alpha-hydroxy acid that promotes epidermal desquamation through its enzymatic activity, acting on corneosomes and keratinocytes. It has also recently been demonstrated that GA acts as an antibacterial agent,[33] and is considered a safe option during pregnancy, as it has minimal dermal penetration when used at concentrations of approximately 30-50% for only a few minutes, thus qualifying as a superficial peel. It is important to highlight that glycolic acid can cause skin irritation and increase photosensitivity, so the use of sunscreen is always recommended during treatment.[33,34] Mandelic acid offers a similar effect, but with lower cutaneous penetration and reduced risk of irritation, making it preferable for sensitive skin.[34]

Salicylic acid (SA), on the other hand, is a beta-hydroxy acid with comedolytic and keratolytic action, which easily penetrates the epidermis, reducing keratinocyte adhesion and promoting the exfoliation of dead cells[35]. It is also capable of penetrating the sebaceous glands, reducing sebum production, and exhibits anti-inflammatory results.[32,35] Its dermal penetration can reach up to 25% when applied over large areas or under occlusion, which requires caution in pregnant women.[35,36] Thus, it is recommended that salicylic acid, when used during pregnancy, be applied only to small areas, at low concentrations, and without occlusion, in order to ensure fetal safety.[37]

Despite advances in the understanding of gestational acne, the absence of specific randomized clinical trials limits the definition of standardized protocols for pregnant women. There is a significant gap in research that comparatively addresses the efficacy and safety of different therapies in this group. Therefore, such treatment must be conducted in an individualized, interdisciplinary, and cautious manner, taking into account both maternal well-being and fetal safety. Although acne is common during this period, the absence of adequate treatment can lead to scarring, secondary infections, and negative psychological impact, reinforcing the importance of therapeutic approaches. This study underscores the need for research that evaluates the safety and efficacy of these strategies, thereby expanding the available therapeutic options.

CONCLUSION

Gestational acne is a challenging dermatological condition, whose therapeutic approach requires rigorous evaluation considering the potential teratogenic effects of various conventional treatments. The analyzed data demonstrate that topical agents such as azelaic acid and benzoyl peroxide present a satisfactory safety profile, with low levels of systemic absorption and no reports of significant adverse effects, and

are recommended as first-line treatment.

Topical and oral antibiotics, such as erythromycin and clindamycin, may be used in moderate cases, provided they are used for short periods. Studies did not identify an increase in teratogenic events or associated obstetric complications.

Non-pharmacological strategies, such as the use of dermocosmetics, botanical active ingredients, chemical peels, microdermabrasion, and light and laser therapies, appear promising, with clinical improvement and minimal incidence of adverse effects. However, they still lack studies validating their safety and efficacy.

Given the above, it is concluded that there is a need for larger studies with treatment protocols specific to this population, as well as the need for management to be individualized and interdisciplinary, aiming for effective and safe outcomes for the pregnant woman and fetus.

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