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Chapter 6

Acneiform Eruptions and Pregnancy

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Additional information is available at the end of the chapter

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Abstract

Acne and acneiform eruptions during pregnancy need special attention. The physician should be aware of the special condition of a pregnant patient. Acne treatments may aim to prevent worsening, secondary infections, scarring and lowering self-esteem of the mother. However, the treatment of acne and acneiform eruptions are not easy to treat during pregnancy. First, because many cosmetics and procedures are not tested on pregnant patients and it is impossible to predict the possible consequences of the procedures on fetus, many women quit cosmetic procedures during pregnancy. Second, the underlying conditions such as hormonal influx and immunosuppression continue. Third, the medications for acne have limitations due to the lack of evidence of safety during pregnancy. Here, a acneiform eruptions during pregnancy, including acne vulgaris, acne rosacea, perioral dermatitis, and hidradenitis suppurativa, are reviewed focusing on these points and each of them is evaluated by clinical presentation, differential diagnosis and treatment options focusing on maternal and fetal safety.

Keywords: acne, acneiform eruptions, sebaceous gland, pregnancy, treatment

1. Introduction

Pregnancy is one of the most "special periods" for a woman. Changes in the endocrine and immune systems and in the metabolism will result in an overall change in body, including skin. Although some of these changes may be physiologic, pregnant women are more careful, meticulous and concerned about their body. As the skin changes can easily be observed by naked eye, this additional problem helps to increase anxiety and lower their self-esteem. During pregnancy, acne can have psychological effects. Even very small changes draw attention and raise questions related to the medical concerns for the baby. Moreover, pregnant women can be anxious and depressed because of their health, self-image, cosmetic problems and limitations on treatments.

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Some of the metabolic changes may also trigger sebaceous and eccrine glands to produce acneiform eruptions. Acneiform eruptions are follicular eruptions characterized by papules and pustules resembling acne. Diagnosis of acne is usually done clinically. However, differential diagnosis of acneiform eruptions during pregnancy should be done carefully and mostly depends on exclusion. Typically acne has predilection sites such as face, neck, chest, and back [1]. Papular and pustular lesions appearing on this sites are generally considered as "acne" which can be a misdiagnose. Moreover, during pregnancy acne rosacea, perioral dermatitis, hidradenitis suppurativa, Fox-Fordyce disease, pruritic folliculitis of pregnancy may be seen in different clinical presentations. So, differential diagnosis of acneiform eruptions should not be underestimated. Gynecologists and family physicians also should be aware of "acne-like" eruptions and consult a dermatologist [2].

Acne and acneiform eruptions during pregnancy also need treatments to prevent worsening, secondary infections, scarring, and lowering self esteem of the mother. However, the treatment of acne and acneiform eruptions are not easy to treat in this life period. First, as many cosmetics and procedures are not tested on pregnant patients and impossible to predict the possible consequences of the procedures on fetus, many women quit cosmetic procedures during that period [3]. Second, the underlying conditions such as hormonal influx and immunosuppression continue. Third, the medications for acne have limitations due to the lack of evidence of safety during pregnancy.

Here in this chapter we will make a close look to acneiform eruptions during pregnancy period including acne vulgaris, acne rosacea, perioral dermatitis, and hidradenitis suppurativa. Each of these diseases will be evaluated by clinical presentation, differential diagnosis and treatment options focusing on maternal and fetal safety.

2. Hormonal changes during pregnancy

In the pregnant women subsequent hormonal changes which are unique for that period appear. The placenta is a fantastic hormone factory that produces large amounts of hCG, relaxin, oestradiol, progesterone and human chorionic somato mammatrophin (hCS or human placental lactogen, hPL). Estrogen production from the placenta as well as the ovary increases gradually from the second month of pregnancy until term. Also, placental progesterone rises to a peak during the fifth month of pregnancy. Moreover, the placenta is a source of human chorionic gonadotropin, which increases during the first trimester and decreases dramatically with the elevation of estrogen and progesterone. The hPL is synthesised from the 4 week of gestation. The hPL stimulates maternal lipolysis and inhibits insulin effects, causing hyperglycaemia [2].

During pregnancy some other hormonal changes occur as well. The anterior pituitary gland increases in weight by more than two-fold during pregnancy with a concomitant increase in gonadotropin hormone secretion. The production and secretion of adrenal cortex hormones are increased in addition to the adrenal hypertrophy. The typical hormonal changes and immunity in pregnancy cause a shift in maternal immune function from cell mediated

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(helper T 1 [TH1] cytokine production) to humoral (helper T 2 [TH2] cytokine production). Moreover, the activity of sebaceous and eccrine glands is increased and apocrine gland activity is decreased. So, all these physiologic changes may influence the course of inflammatory and glandular skin disease during gestation [4].

3. Acne in pregnancy

Acne vulgaris is a chronic inflammatory disorder clinically presenting with comedones, papules, pustules and cysts. The course of acne in pregnancy is unpredictable and severity shows variations [4, 5]. In the majority, pregnancy has a beneficial effect on the activity of acne, and often improves in the first trimester. This is suggested to be related with the sebosuppressive effect of estrogens [5]. In a small number of cases, there is a flare-up of acne requiring active intervention, especially if scarring is a threat. Ratzer reported 58% improvement and 29% reporting worsening of acne during pregnancy [6]. In another study, improvement of acne by 41% in pregnant women was reported [7].

The increase in sebaceous gland activity, especially during the third trimester, results in an aggrevation of acne which is most upsetting at this time. Other clinical findings are post inflammatory pigment alterations and flare of truncal acne [2]. Some women experience new-onset acne, such as acne conglobata, in the postpartum period ("postgestational acne") [4, 8].

Hyperandrogenism in pregnancy is rare and can develop in any trimester. The signs and symptoms are similar as the non pregnant women and may present as acne and hirsutism. The most common ovarian pathologies that present during pregnancy and which lead to hyperandrogenic states are hyperreactio luteinalis (HL) and pregnancy luteoma (PL) whereas ovarian tumors and adrenal pathologies are very rare. Although spontaneous regression occurs in the post-partum period in the vast majority of cases, such cases with a clue of androgen excess should be re-evaluated by means of underlying pathologies and fetal virilisation [9].

Acne cosmetica and pregnancy: sunscreens are commonly used in pregnancy to treat or prevent melasma. Pregnant women are adviced and prefer to use inorganic sun blockers such as zinc oxide, titanium dioxide, iron oxide, talc, and calamine which are generally safer than their organic counterparts due to their nontoxic, stable properties and absence of systemic absorption. But these formulations are thick pastes that promote comedogenesis [10, 11]. So, pregnant women may experience extensive acne problem while trying to prevent melasma.

Treatment of acne in pregnancy is challenging as most drugs are contraindicated or considered unsafe [12]. The Food and Drug Administration (FDA) has five established categories to indicate potential teratogenicity of a medication when used by patients during pregnancy. FDA categories are shown as **Table 1**.

The treatment of acne during pregnancy depends on its type and severity. Unfortunately, there are no "evidence" level studies to support the clinical efficacy of any acne treatment during pregnancy or lactation [13]. The available reports are mainly observational studies and often with small samples sizes. There are pregnancy-exposure registries that collect data

Category	
A	Well-controlled studies in humans show no risk to the fetus
B	No well controlled studies have been conducted in humans, animal studies show no risk to the fetus
C	No well controlled studies have been conducted in humans; animal studies have demonstrated an adverse effect on the fetus
D	Evidence of human risk to the fetus exists; however benefits may outweigh risks in certain situations
X	Controlled studies in animals or humans demonstrate fetal abnormalities; the risk in pregnant women clearly outweighs any possible benefit

Table 1. FDA categories for drug use during pregnancy.

on the use of certain medications in pregnancy. However, there are no relevant registries for "acne" treatments [14]. Although there is no evidence-based recommendations about acne treatment during pregnancy, it should depend on acne type, severity and in its impact on quality of life. The goal of treatment and expectations of patient should be determined based on risk/benefit ratio and should rely on relief of symptoms rather than total clearance.

There are many oral and topical medications for the treatment of acne. Some of the patients might be using one or more of these treatments before conception. It is not always very easy while deciding to stop or not therapy because the evidence to guide this clinical question is not relevant. The half-life of medications and FDA categories may be a key to answer these questions.

3.1. Systemic treatments

For severe acne, systemic treatments may be needed to avoid scarring. There are only few options available for the safe management of acne in pregnancy. Isotretinoin, which is the mainstay of treatment for severe and nodulocystic acne, is contraindicated in pregnancy. Hormonal treatments (anti-androgens, spironalacton) also should be avoided for its effects on fetus. Some of the oral antibiotics are safe during pregnancy and can be used.

3.1.1. Isotretinoin

Systemic retinoids are important treatments in women with moderate to severe acne, but must be avoided during pregnancy due to teratogenicity. Isotretinoin, is FDA pregnancy category X. Its association with increased risk of spontaneous abortion, retinoid embryopathy which is specific with facial and palatal defects, micrognathia, cardiovascular defects, and developmental problems of the central nervous system and thymus have been reported [15, 16]. Both isotretinoin and its metabolite are thought to be teratogenic. The half-life of isotretinoin is 10–20 h and its metabolite (4-oxo-isotretinoin) between 17 and 50 h. General recommendation is five times this half-life would be enough to allow levels of the drug to return to negligible levels. So, a washout period (one month between completely discontinuing isotretinoin – beginning attempts to conceive a pregnancy) will be needed [13]. Similarly, conception one menstrual

cycle after completely stopping isotretinoin is advised in a published guideline [17]. But on the contrary, many cases of unwanted pregnancies and relevant abortuses have been reported all over the world [18]. This indicates that there is still insufficient control of isotretinoin associated with pregnancy. So pregnant women with acne should be questioned in detail about the total dosing, the time of last dose of isotretinoin and in case of a suspicion, prenatal diagnostic research should be provided.

3.1.2. Antibiotics

In non-pregnant patients oral antibiotics are commonly prescribed as a second-line therapy for acne and the most commonly used are tetracyclines: doxycycline, oxytetracycline, lymecycline, minocycline, and tetracycline [19]. Penicillins, macrolides, and cephalosporins are thought to have the best safety profile in pregnancy with erythromycin the oral antibiotic most commonly used for acne in pregnancy [18]. But tetracyclines should not be used during pregnancy, as use in the second and third trimester can cause discoloration of teeth and bones [20].

During pregnancy, erythromycin should be the first choice in case of a necessity [21]. As it is used in pregnancy to treat other infections, there is quite satisfactory data coming from these retrospective studies of pregnancy outcomes. Its usage in combination with a topical preparation is recommended to avoid bacterial resistance [14, 22]. Only, erythromycin estolate is not recommended in pregnancy because of potential risk of reversible hepatotoxicity which is rarely reported with other ester forms. The common side effect of erythromycin is gastrointestinal dyspepsy and rarely increasing serum levels of medications metabolized by cytochrome p450 enzymes [20].

Another macrolide antibiotic that can be used for treatment of acne in pregnancy is oral azithromycin. It has efficacy against *Propionibacterium acnes* and anti-inflammatory actions and in a study comparing the efficacy of azithromycin with doxycycline, azithromycin was found to be as effective as doxycycline. The longer half-life of 68 h also can be advantage as a single daily dose [23]. Also a new macrolide antibiotic, roxithromycin is shown to be effective on acne lesions with similar safety with erythromycin, has a better side effect profile and less frequently associated with bacterial resistance. The only disadvantage is being expensive [24].

Oral clindamycin is also considered to be effective and safe for use in pregnancy but due to one serious potential side effect it is rarely used. Disturbance of gastrointestinal flora by this agent can cause pseudo-membranous colitis. Diarrhea is also a common side effect [25].

3.1.3. Hormonal treatment

Hormonal therapy includes oral contraceptive pills (OCP) and androgen receptor blockers such as cyproterone acetate and spironolactone which are particularly useful in the treatment of acne linked to hyperandrogenism. However, these anti androgenic treatments are not suggested to be used during pregnancy because of the risk of hypospadias and feminization of a male fetus [26]. Also, higher incidence of Down syndrome has been reported with use of OCPs in early pregnancy [27].

3.1.4. Zinc

Oral zinc salt preparations have historically been shown to be effective in reducing the severity of mild and moderate inflammatory acne vulgaris when either used alone or in combination with another acne treatment [28]. Zinc sulfate (N) and zinc gluconate (N) have been shown to be effective in the treatment of acne vulgaris at elemental doses of 30–150 mg daily [29]. It is shown that elemental zinc has no harm at doses below 75 mg/day to the growing fetus [30]. There is huge literature data on the use of zinc salts in lactation, but no adverse effects have been reported thus far.

3.2. Topical treatments

Topical medications are first line therapies for acne [31]. Most of the pregnant women prefer staying on the safe zone rather than aesthetic targets. Also, both patients and physicians prefer topical treatments only to avoid possible side effects especially on fetus [32].

Proper cleansing is an important step in acne treatment, also in pregnancy. Twice daily washing with a gentle cleanser followed by a topical preparation should be the first step. Mechanical comedo removal can be performed with a comedone extractor in comedonal forms.

3.2.1. Azelaic acid

It is a dicarboxylic acid with antimicrobial, anti-inflammatory and comedolitic properties. Also, being a competitive inhibitor of thyrosinase it decreases pigmentation. This effect on pigmentation could be used as an advantage when tendency to pigmentation is increased in pregnancy. It is generally well tolerated with a transient burning sensation but has no phototoxic or photoallergic potential. Azelaic acid is pregnancy category B, with no known fetal effects. Studies indicate that using high oral doses in animals do not cause teratogenic effects in the offspring, but there are no controlled studies in humans. It is also present in milk, rye, barley, and wheat. So azelaic acid can be a good choice for topical acne treatment in pregnancy [31].

3.2.2. Benzoyl peroxide

Benzoyl peroxide (BP) is one of the most common topical preparations with varying concentrations of 2.5–10%. There are many forms of BP such as cream, lotion, gel, wash, and pledgets. BP is a powerful antimicrobial agent. By decreasing the hydrolysis of triglycerides and generation of reactive oxygen species within the follicle, it has bactericidal effect. Moreover, bacterial resistance does not develop against that antimicrobial agent. That makes it an ideal combination for topical or systemic antibiotic therapy. But it is in FDA category C should be used during pregnancy on a limited area and only if needed [32].

3.2.3. Salicylic acid

Salicyclic acid is a comedolytic and anti inflammatory agent which is commonly found in many over the counter and prescription acne preparations. It is FDA pregnancy category C. Although there are no human studies on topical salicylic acid usage during pregnancy, there

is no report of teratogenicity as well. It is usage may be limited with facial washes or cleansers to avoid long exposure and systemic absorption during pregnancy [31].

3.2.4. Glycolic acid

Glycolic acid is an alpha-hydroxy acid with keratolytic effect and used in the treatment of mild, comedogenic, and noninflammatory acne by its comedolytic effect. It also reduces sebum production [33]. There is no FDA pregnancy category assigned for glycolic acid but glycolic acid peels have been used extensively, and apparently safely in pregnancy [31].

3.2.5. Sulfacetamide with sulfur compounds

Sulfacetamide is a bacteriostatic agent that inhibits bacterial growth via inhibition of dihydropteroate synthetase with additional anti-inflammatory action from additional sulfur compounds [34]. Sulfur has been used for many years for treating pregnant women suffering from scabies with sulfur-containing ointments on a whole body surface with no adverse results. Although elemental sulfur, typically compounded in cream or ointment form, is considered safe in pregnancy; there are minimal data about safety of sulfacetamide during pregnancy.

3.2.6. Topical antibiotics

Many topical antibiotics can be used in the treatment of acne for their effect on *P. acnes*. In general, if a systemic antibiotic is considered safe in pregnancy, its topical formulation is also deemed safe. Topical agents are often added to oral antibiotics because of synergistic effects [13]. Erythromycin and clindamycin are the most commonly used topical antibiotics for acne. Both erythromycin and clindamycin are category B. They have bactericidal effect on *P. acnes*, reduce pro-inflammatory free fatty acids and have anti-inflammatory effect. However, antibiotic resistance to *P. acnes* is a very frequent problem. Results of many studies denote combination of these antibiotics with different concentrations of BP are suggested to overcome this problem [31].

Metronidazole is also an antiinflammatory, immunosuppressive, and antimicrobial properties. In a study, 2% metronidazole gel was shown to be effective for moderate acne vulgaris [35]. It is in FDA pregnancy categorize B. Also, an investigation of metronidazole usage during pregnancy revealed no association with preterm birth, low birth weight, or congenital anomalies [36].

Tetracyclines are also commonly used topical acne preparations in non-pregnant patients. Even though they have a broad-spectrum bacteriostatic activity, their use in pregnancy is not suggested as they cross the placenta and bind strongly to calcium ions. After the 16th week of pregnancy, these can result in deciduous teeth discoloration and bone growth inhibition [20].

3.2.7. Topical retinoids

Topical retinoids are commonly used in acne treatment especially in comedogenic and inflammatory forms as they have anti-comedonegic, anti-inflammatory effects and normalize desquamation of the follicular epithelium. Three topical retinoids are currently

available: adapalene, tretinoin, and tazarotene. Adapalene and tretinoin are pregnancy category C while tazarotene is category X. Tazoretene cannot be used in pregnancy. However, the data about the systemic absorption and teratogenity of adapalene and tretinoin are limited. There are case reports describing retinoid embryopathy, specifically ear, cerebral, and cardiac malformations in infants who were exposed to retinoids in utero, due to maternal topical tretinoin usage [37–41]. But some other studies did not reveal a significantly increased risk associated with topical tretinoin [42–44]. In one retrospective case control study of 235 pregnant women exposed to topical retinoids in the first trimester (including adapalene, tretinoin, tazarotene, and retinol) were evaluated for fetal embryopathy and were compared with 444 controls. No significant difference was reported between the groups regarding the rate of spontaneous abortion, minor or major birth defects; including retinoid teratogenity [45]. However, study authors concluded that topical retinoids could not be safely recommended for use during pregnancy because of the inferred risk based on safety data associated with systemic retinoid medications. Still, topical retinoids cannot be advised for use during pregnancy [32].

3.3. Phototherapy and lasers

Various forms of phototherapy and lasers are under investigation for their use in treating acne vulgaris and some of them have already been FDA approved for the treatment of some forms of acne. As ultraviolet light has been reported to be beneficial by most of the patients, studies focused on mechanisms and using light as a treatment option [31]. Both visible and laser light are effective treatments for acne. Visible light and many lasers target porphyrins endogenously produced by *P. acnes*. Laser and light therapies have few if any side effects and appear to be safe during pregnancy. Ultimately, combining laser and light with topical therapy may well become the mainstay of acne treatment [46].

The main devices used for acne treatments are lasers (pulse dye lasers (PDL), potassium titanyl phosphate lasers (KTP), infrared diode lasers) and intense pulsed light systems (IPL), broad-spectrum of visible light sources (blue light, blue-red light), and photodynamic therapy (PDT). The supposed mechanisms of action for optical treatments are photothermal heating of sebaceous glands and photochemical inactivation of *P. acnes*, which produces coproporphyrins and protoporphyrins. Moreover, photoimmunological reactions may possibly contribute to improve acne [47].

Narrowband-ultraviolet B phototherapy (NB-UVB) has been reported as a treatment for acne in pregnancy with its local immunosuppressive effects on skin. In one case report, a successful treatment with NBUVB treatment of acne vulgaris in a woman who was 5 months pregnant was reported [48]. The data regarding the safety of NBUVB treatment in pregnant women comes from its use in pregnant psoriasis patients. But recently it has been shown that patients with high cumulative NBUVB doses have a decrease in serum folic acid levels [49]. This finding is especially important for the pregnant women as they usually need folic acid supplementation to prevent neural tube defects. During treatment period dermatologists should be aware of the folic acid levels, check regularly and cooperate with the obstetrician of the patient.

4. Rosacea in pregnancy

Acne Rosacea is a chronic inflammatory condition of the facial skin affecting the blood vessels and pilosebaceous units. Patients usually present with red papules pustules on the face in addition to complaints of flushing, blushing, and sensitivity of skin [50]. It may manifest as papules and pustules as well as other forms such as centrofacial distribution of blushing and telangiectasia (erythematotelangiectatic rosacea), phymatous changes, or ocular rosacea [4].

Similar to acne, the course of rosacea in pregnancy is unpredictable. There are a limited number of case studies related with the course of rosacea during pregnancy. But, as there are reports about rosacea fulminans in pregnancy, it should be taken into consideration by means of prognosis. Rosacea fulminans is a rare and severe subtype of rosacea that is characterized by the sudden onset of severe facial inflammation consisting of numerous pustules, cystic swellings and coalescing sinuses. Three cases of RF in pregnancy were reported with differing obstetric outcomes: an intrauterine death, a termination of pregnancy, and a normal vaginal delivery [51]. Rosacea fulminans is the only indication for topical or systemic corticosteroids in the treatment of rosacea [52]. One case of RF in pregnancy successfully treatment with systemic azithromycin and topical metronidazole [53]. Another patient with RF in pregnancy presented with severe ocular disease culminating in ocular perforation [54]. A case of pregnant woman who had rosacea fulminans during the first trimester presented and treated with conventional therapeutic approaches with systemic corticosteroids were associated with clear improvement within 2 months, and subsequently only 0.75% metronidazole topical cream was used during the second trimester [55]. One patient with rosacea fulminans in pregnancy was complicated by stillbirth [56].

Generally the treatment of rosacea during pregnancy relies the avoiding triggering factors such as sun exposure, wind, physical irritation, anxiety and spicy food, as so as in the non pregnants. In pregnancy, general safety precautions are the same with acne medications. Azelaic acid and topical antibiotics, including metronidazole, clindamycin, and erythromycin, may be used for treating papulopustular rosacea. In the erythematotelangiectatic form light based therapies such as lasers can be used [57]. But a delay in their use is suggested as the condition may improve spontaneously after delivery [4].

5. Perioral dermatitis in pregnancy

Perioral dermatitis is also should be differentiated from acne vulgaris. It is an acneiform eruption of unknown etiology. Fluorinated topical corticosteroids, contact dermatitis, and over moisturization of skin were implicated in the etiology. Clinical appearance is papulopustular lesions as clusters localizing periorally (on the chin or nasolabial folds, but not on the vermilion border of the lips) with an erythematous base [58]. There are few data about the perioral dermatitis in pregnancy. Yang et al. emphasizes flares to have been noted, but not as a regular finding [4]. Treatment with topical and oral agents is the same as that of acne vulgaris or rosacea.

6. Hidradenitis suppurativa in pregnancy

Hidradenitis suppurativa/acne inversa (HS) is a chronic, inflammatory, recurrent and debilitating skin disease of the terminal follicular epithelium caused by occlusion and rupture of follicular units with subsequent inflammation of the apocrine glands [4]. It is destructive in nature and manifests as painful inflammatory nodules and sterile abscesses located in hair and apocrine gland-bearing skin creases in the axilla; groin or perineum, buttocks, and/or breast [59]. The disease often progresses with the formation of draining sinus tracts and due to subcutaneous extension with induration, destruction of skin appendages, and subsequent scarring [2, 60]. The etiology of the disease seems to be multifactorial and is only fragmentarily understood. The role of hormones in HS remains unclear, but the female predominance, typical onset of the disease after puberty, observation of premenstrual flares, and improvement during pregnancy and the traditionally described resolution after menopause suggest a hormonal/metabolic background [61, 62]. However, as some patients experience improvement and some other worsening in pregnancy. A typical relationship between HS and pregnancy has not been confirmed. A literature review presents two cases of women who had improvement or remission of their disease during pregnancy with some rebound symptoms postpartum supporting this hormonal effect [63]. The condition is associated with hyperandrogenism and often is accompanied by acne, hirsutism, and irregular menses. The reported positive effects of antiandrogen therapy supports a possible role of androgens [64]. Another study showed no evidence of biochemical hyperandrogenism in HS, noting both persistence and primary development of the disease in the postmenopausal state [65]. Findings, therefore, remain inconsistent. Obesity contributes significantly to HS pathogenesis; diabetes, dyslipidemia, the metabolic syndrome, and polycystic ovarian syndrome are among the commonest comorbidities. More studies are required to clarify a potential hormonal dysregulation in HS [61].

One of the first staging systems for HS was proposed by Hurley (**Table 2**). Hurley separated patients into three groups based largely on the presence and extent of cicatrization and sinuses [66].

Management of HS includes emotional support, given the debilitating nature of the disease; counseling to wear loose fitting clothing to avoid aggravating the areas. For patients with Hurley stage I, antibiotics are a good first-line therapy. The same oral antibiotics mentioned for acne as well as oral clindamycin can help during pregnancy and provide antiinflammatory effects. Limited lesions can be injected with corticosteroids, and flares can be addressed with short courses of oral or intramuscular corticosteroids. Patients with Hurley stage II,

Hurley stage	Extent of disease in tissue
I	Abscess formation (single or multiple) without sinus tracts and cicatrization
II	One or more widely separated recurrent abscesses with tract formation and scars
III	Multiple interconnected tracts and abscesses throughout an entire area

Table 2. Hurley staging system for hidradenitis suppurativa.

long-term immunosuppressive therapy or surgical therapies, such as limited excisions or the laying open of sinus tracts, may be helpful. Patients with Hurley stage III may have such debilitating disease that only surgery can adequately address their symptoms. Wide excision of all the patients' affected tissue and the underlying sinus tracts is the most effective treatment for these patients [67]. The use of TNF-α inhibitors in pregnancy remains controversial, and biologic medications should be used only if benefit greatly outweighs the risks and all other treatment options have been exhausted [68].

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