

NCBI Bookshelf. A service of the National Library of Medicine, National Institutes of Health.

StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-.

Diaper Dermatitis

Authors

Anthonella B. Benitez Ojeda; Magda D. Mendez¹.

Affiliations

¹ Lincoln Medical Center/Weil Cornell

Last Update: July 3, 2023.

Continuing Education Activity

Diaper dermatitis is an inflammatory reaction of the skin of the perineal and perianal areas (diaper area). It is the most common skin disorder seen in young infants. It can be caused by chemical irritation, infection, or atopy. This activity reviews the evaluation, management, and treatment of diaper dermatitis. The role of the interprofessional team will be reviewed.

Objectives:

- Identify the etiology of diaper dermatitis.
- Describe the pathophysiology of diaper dermatitis.
- Summarize the key physical examination findings of diaper dermatitis.
- Outline the management options available for diaper dermatitis.

[Access free multiple choice questions on this topic.](#)

Introduction

Diaper dermatitis is an inflammatory reaction of the skin of the perineal and perianal areas (diaper area). It is the most common skin disorder seen in young infants. It is most commonly caused by irritation of the skin; however, there are other causes such as atopic dermatitis and seborrheic dermatitis that can present as a diaper rash. Another common reason is infection with *Candida albicans*, which can be primary or secondary. Diaper dermatitis is usually a mild and self-limited condition that requires minimal intervention. Some of the management approaches include skincare, adequate hygiene, and avoidance of any irritant substance.[1]

Etiology

Diaper dermatitis is an inflammatory reaction of the skin around the diaper area. It results due to a combination of multiple factors such as increased moisture, prolonged contact with urine or feces, and other irritants like detergents. [2]

The second most common cause of diaper dermatitis is infection. Fungal infection, especially by *Candida albicans*, is the most common infectious cause. Candida infection can be a primary cause of diaper dermatitis and can also result as a superimposed infection to chronic irritation. Other mycoses that can be associated with diaper dermatitis include dermatophytosis, exacerbation of seborrheic dermatitis by *Malassezia*, and other pseudomycotic conditions like erythrasma.[3]

Bacterial infections follow fungal as the second most common cause of infectious diaper dermatitis. *Staphylococcus aureus* infection can occur in newborns, secondary to colonization from the umbilical cord. *Streptococcus pyogenes* is also seen as an etiologic agent causing the condition.[4]

Epidemiology

Diaper dermatitis can affect any individual using diapers without any gender preference. Newborns and infants are at an increased risk due to skin immaturity. Peak incidence is around 9 to 12 months of age. Diaper dermatitis occurs in about 50% of infants, and it accounts for about 25% of visits to primary care physicians related to dermatologic complaints in the first year of life.[5]

There are risk factors associated with the development of diaper dermatitis, such as:

- Age: newborn and infant skin are more immature and show increased susceptibility.
- Diet: changes in diet as the infant grows are related to changes in intestinal microbiota and stool pH. Breastfeeding has been proven to be a protective factor.
- Frequency of diaper changes: prolonged contact with irritants such as urine and feces increases the risk of skin inflammation. Newborns and young infants whose diapers are changed more frequently tend to be less affected than older infants.[6]

Pathophysiology

The most important predisposing factor for diaper dermatitis is the increased moist that results from wearing diapers, which leads to increased friction and maceration, which makes the skin more susceptible to damage and penetration by skin microorganisms and other irritants.[7][6]

Changes in skin pH also play an essential role; an increase in pH around the diaper area from the breakdown of urinary urea can, in turn, increase fecal enzyme activity that can further damage the skin.[8][9] The combination of these processes results in colonization and infection from organisms such as *Staphylococcus aureus*, *Streptococcus pyogenes*, and *Candida albicans*.

History and Physical

The presentation may begin with a history of increased frequency of stools or changes in its appearance (loose), followed by the development of erythema around the diaper area about two days after. Physicians must elicit from parents hygiene practices, frequency of diaper changes, type of diapers used, and use of any substance that may be worsening the irritation.

Clinical presentation can be variable. Skin findings include erythema, papules, scaling, and erosions that can be present around the thighs, scrotum, suprapubic area, and buttocks. It usually spares skin creases.[6]

Candida dermatitis presents with erythema and scaly plaques, accompanied by edema. The most characteristic feature is the presence of satellite pustules or papules. Candidal dermatitis can be present in the skin folds. In severe cases, erosions and ulceration can occur.[3]

Clinical manifestation of *S. aureus* infection can range from small papules and pustules to large, fragile blisters of bullous impetigo. *S. pyogenes* presents with fiery-red erythema and maceration that involves the skin folds.[4]

Evaluation

Diaper dermatitis is a clinical diagnosis based on history and physical examination findings. Overall, there is no need to perform any laboratory testing. However, when considering infection by *Candida albicans*, confirmation of the

diagnosis by examination with KOH can be useful, although not necessary. If there is suspicion of bacterial infection, Gram staining can be performed.[3]

Treatment / Management

Management of diaper dermatitis has two main goals: healing of damaged skin and prevention of rash recurrence.

The strategies to achieve these goals include:

- Good hygiene is essential to maintain skin integrity and prevent further breakdown. Reducing the exposure to irritants, like urine and feces, can be achieved with frequent diaper changes and using superabsorbent diapers that help reduce skin over-hydration.
- Bathing and cleaning the diaper area with water and a soap-free cleanser.
- The use of wet wipes has been controversial over the years, mainly due to the concern that the components could cause further irritation to the skin. However, recent studies have shown that baby wipes do not cause any harm to the skin. Furthermore, the newer formulations of wipes that include pH buffers help to balance the alkaline pH of the urine and prevent skin damage due to pH changes. It is important to advise parents that the wipes should be free of soap, essential oils, or other fragrances and harsh detergents that can be irritant to the skin.[10]
- The use of topical emollients is recommended for both prevention and treatment. They can improve the skin barrier function, and they also provide a barrier between the skin and the diaper, urine, and feces, not limiting the contact with the skin and diminishing irritation, but also preventing over-hydration to the skin. For the management of current diaper dermatitis, apply with each diaper change. Examples of emollients available include zinc oxide, petrolatum, cod liver oil, lanolin, among others.[10]
- For cases of diaper dermatitis that do not improve within 2 to 3 days of implementing the measures above, or in moderate to severe cases, a short course of low-potency corticosteroids can be used. Hydrocortisone 0.5% 2 times a day for one week.[3]
- When treating candida diaper dermatitis, topical antifungals should be added to the regimen. Nystatin can be used first, applied with every diaper change, with a generally good response; however, if by 1 to 3 days, there is no improvement of symptoms (also keeping in mind Candida resistance to nystatin), switching to azoles is recommended. Clotrimazole, miconazole, or ketoconazole can be used, applied twice a day for 7 to 10 days.
- In cases of bacterial infection, topical antibiotics may be necessary. And in cases of severe infections, such as perianal streptococcal dermatitis, oral antibiotics are indicated.[10]

Differential Diagnosis

The differential diagnosis of diaper dermatitis includes any skin condition that can present around the diaper area.

- Seborrheic dermatitis usually presents in the first month of life. Characterized by skin erythema and scaling, that begins in the scalp and distributes to the face. It has the potential to spread to the diaper area, making babies more susceptible to the development of irritant diaper dermatitis.[6]
- Atopic dermatitis usually presents between 3 and 12 months of age. The presentation includes extreme pruritus with dryness and erythema. Lesions typically involve skin flexures. The diaper area is generally spared.[6]
- Allergic contact dermatitis, secondary to reactions to fragrances or preservatives. It usually occurs after the introduction of a new skin product, and it involves any part of the skin where the product was applied.[5]

Other differential diagnoses that need to be taken into consideration include tinea cruris, scabies, acrodermatitis enteropathica, biotin deficiency, Langerhans cell histiocytosis (Letterer-Siwe disease), congenital syphilis, Kawasaki disease, and HIV infection.[11][12]

Prognosis

Diaper dermatitis has an excellent prognosis with appropriate diagnosis and with timely adequate management. It is usually a mild, self-limiting disease.

Complications

Complications of irritant diaper dermatitis include superimposed infection either with fungal or bacterial microorganisms. Special consideration must be taken when these infections occur in immunocompromised patients since they are at risk of invasive disease.[13]

Consultations

Diaper dermatitis is a condition that can be safely managed by a general practitioner. However, a consult to dermatology may be warranted in cases of an extensive disease that does not respond to treatment. If there is suspicion of a superimposed bacterial infection or extensive/invasive disease, consultation with infectious disease specialists may be required.

Deterrence and Patient Education

Education on proper diaper skincare must be provided as part of the anticipatory guidance of each well-care visit, including frequency of diaper change, guidance on the types of diapers and wipes to use, and application of the barrier emollients with diaper changes.[10]

Pearls and Other Issues

- Diaper dermatitis is one of the most common skin disorders in infants.
- The most common cause is irritant contact dermatitis due to occlusive diapers and prolonged exposure to urine and feces.
- Candida infection is the second most common cause, but superimposed infection by bacterial microorganisms can also develop.
- Management is based on good hygiene and diaper area skincare.
- Other causes of diaper rash, such as seborrheic dermatitis and psoriasis, may also be present.

Enhancing Healthcare Team Outcomes

Diaper dermatitis is one of the most common dermatologic conditions in the newborn period and early infancy. It is of great importance that all healthcare professionals at any level be familiar with the characteristics of the disease and how to manage it, and to be able to provide appropriate guidance to the parents and caregivers.

Management of diaper dermatitis does not necessitate the involvement of an interprofessional team to achieve appropriate treatment; however, as some cases can be more challenging, it is important to obtain timely consults whenever the need arises.

Review Questions

- [Access free multiple choice questions on this topic.](#)
- [Click here for a simplified version.](#)
- [Comment on this article.](#)

References

1. Ravanfar P, Wallace JS, Pace NC. Diaper dermatitis: a review and update. *Curr Opin Pediatr*. 2012 Aug;24(4):472-9. [PubMed: 22790100]
2. Prasad HR, Srivastava P, Verma KK. Diaper dermatitis--an overview. *Indian J Pediatr*. 2003 Aug;70(8):635-7. [PubMed: 14510084]
3. Bonifaz A, Rojas R, Tirado-Sánchez A, Chávez-López D, Mena C, Calderón L, María PO. Superficial Mycoses Associated with Diaper Dermatitis. *Mycopathologia*. 2016 Oct;181(9-10):671-9. [PMC free article: PMC5014885] [PubMed: 27193417]
4. Coughlin CC, Eichenfield LF, Frieden IJ. Diaper dermatitis: clinical characteristics and differential diagnosis. *Pediatr Dermatol*. 2014 Nov;31 Suppl 1:19-24. [PubMed: 25403935]
5. Cohen B. Differential Diagnosis of Diaper Dermatitis. *Clin Pediatr (Phila)*. 2017 May;56(5_suppl):16S-22S. [PubMed: 28420251]
6. Kellen PE. Diaper dermatitis: differential diagnosis and management. *Can Fam Physician*. 1990 Sep;36:1569-72. [PMC free article: PMC2280139] [PubMed: 21233927]
7. Stamatas GN, Tierney NK. Diaper dermatitis: etiology, manifestations, prevention, and management. *Pediatr Dermatol*. 2014 Jan-Feb;31(1):1-7. [PubMed: 24224482]
8. Berg RW, Buckingham KW, Stewart RL. Etiologic factors in diaper dermatitis: the role of urine. *Pediatr Dermatol*. 1986 Feb;3(2):102-6. [PubMed: 3952026]
9. Buckingham KW, Berg RW. Etiologic factors in diaper dermatitis: the role of feces. *Pediatr Dermatol*. 1986 Feb;3(2):107-12. [PubMed: 3513143]
10. Blume-Peytavi U, Kanti V. Prevention and treatment of diaper dermatitis. *Pediatr Dermatol*. 2018 Mar;35 Suppl 1:s19-s23. [PubMed: 29596731]
11. Higuchi R, Mizukoshi M, Koyama H, Kitano N, Koike M. Intractable diaper dermatitis as an early sign of biotin deficiency. *Acta Paediatr*. 1998 Feb;87(2):228-9. [PubMed: 9512215]
12. Fölster-Holst R. Differential diagnoses of diaper dermatitis. *Pediatr Dermatol*. 2018 Mar;35 Suppl 1:s10-s18. [PubMed: 29596730]
13. Shin HT. Diagnosis and management of diaper dermatitis. *Pediatr Clin North Am*. 2014 Apr;61(2):367-82. [PubMed: 24636651]

Disclosure: Anthonella Benitez Ojeda declares no relevant financial relationships with ineligible companies.

Disclosure: Magda Mendez declares no relevant financial relationships with ineligible companies.

Copyright © 2024, StatPearls Publishing LLC.

This book is distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0) (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits others to distribute the work, provided that the article is not altered or used commercially. You are not required to obtain permission to distribute this article, provided that you credit the author and journal.

Bookshelf ID: NBK559067 PMID: 32644493