

Review Article

Common types and presentations of pediatric rashes in the primary care

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ABSTRACT

Many types of rashes have been reported in the literature, and therefore, the diagnosis might be misleading because it needs adequate knowledge about clinical manifestations. Furthermore, it is well-known that, although some types of rashes might have distinct features that can lead to diagnose the underlying cases easily, these features are not always present in all of the reported cases, which might also contribute to the misdiagnosis of these conditions. The present literature review aims to report the most common types and presentations of pediatric rashes in primary care. We have discussed atopic dermatitis, molluscum contagiosum, scarlet fever, pityriasis rosea, and exanthema subitum. Establishing a proper diagnosis between the different lesions is essential before making the diagnosis and planning the management approaches. Some of these lesions are usually self-limited. However, some of them might be associated with serious complications if neglected and were not adequately treated. Besides, the prevalence of these conditions seems to be high among the pediatric population, and therefore, planning for future interventional approaches is critical for adequate management and improved general healthcare status.

Keywords: Pityriasis rosea, Molluscum contagiosum, Atopic dermatitis, Generalized rash, Pediatrics, Rash, Scarlet fever

INTRODUCTION

In the primary care settings, attending physicians commonly observe generalized rashes, which were also reported to be a common reason for an initial presentation

to a dermatologist.¹⁻³ Estimates indicate that around 12 million clinical visits are usually reported worldwide, and evidence indicates that primary care physicians usually have the first look over these children in 68% of the cases.⁴

Many mistakes have been reported because of the misdiagnosis of rash in the pediatric population.^{5,6} However, it should be noted that evidence indicates the importance of adequate diagnosis of rash because the management hugely varies based on the underlying etiology of these rashes. Furthermore, some rashes might attribute to serious diseases and life-threatening disorders. Many types of rashes have been reported in the literature, and therefore, the diagnosis might be misleading because it needs adequate knowledge about clinical manifestations. Furthermore, it is well-known that, although some types of rashes might have distinct features that can lead to easily diagnose the underlying cases, these features are not always present in all of the reported cases, which might also contribute to the misdiagnosis of these conditions.⁷ In the present literature review, we aim to report the most common types and presentations of pediatric rashes in primary care.

LITERATURE REVIEW

This literature review is based on an extensive literature search in Medline, Cochrane, and EMBASE databases which was performed on 25th September 2021 using the medical subject headings (MeSH) or a combination of all possible related terms, according to the database. To avoid missing potential studies, a further manual search for papers was done through Google Scholar, while the reference lists of the initially included papers. Papers discussing pediatric rashes in primary care were screened for useful information. No limitations were posed on the date, language, age of participants, or the publication type.

DISCUSSION

Atopic dermatitis

Evidence indicates the high prevalence of atopic dermatitis among the pediatric population, and estimates from the United States show that 20% of children suffer from this inflammatory skin disease.⁸ It has been demonstrated that the condition usually relapses, being chronic and pruritic naturally. Infants and young children are the most commonly affected, and reports also show that the disease might persist during childhood. Different manifestations have been noticed on the affected children, including various skin symptoms that include excoriations, scaling, vesicular lesions, extensively dry skin, and erythematous papules and plaques. The child's age can also affect the observations related to the distribution of these lesions across their skin. For instance, lesions over the extensor surfaces of the hands and legs are the most commonly affected with the affected infants and young children, in addition to the scalp and cheeks (Figure 1). On the other hand, older children usually present with lesions over the flexor surfaces (most commonly the popliteal and antecubital fossae) where plaques and patches are variously found in this region. Reports also show that the feet and hands are

also commonly affected by these lesions. In severe cases, it was reported that the appearance of thickened plaques with a lichenified surface is usually observed. Secondary skin infections might also develop as a complication to atopic dermatitis because the skin of the affected children is usually dry and flaky.⁸ The management of the condition is mostly directed to manage and limit the spread of these lesions and not to cure them. Parenteral counseling and education about the skincare of their affected children are also essential to achieve good management outcomes. For instance, emollients are frequently recommended to be extensively used for these children, in addition to avoiding the triggers that might aid to the pathology of the affected skin, like frequent hot baths, cold weather, harsh detergents, and fragrant products. When flare-ups of the lesions are observed among children, it has been demonstrated that the use of skincare products might not be sufficient to manage the cases, and therefore, the administration of topical corticosteroid is usually recommended in these situations. In cases when there is resistance to treatment after applying adequate care to the skin, patients should be referred to have a skin biopsy from the relevant lesions for inspection and evaluation to indicate whether an infection is present or not.⁸



Figure 1: Atopic dermatitis.

Molluscum contagiosum

Evidence indicates that the condition is common among the pediatric population. The etiology of the condition is mainly attributed to an infection by the poxvirus. The most commonly affected pediatric age group range between 2 and 11 years old due to the infection by this highly contagious virus.⁹ Moreover, sexually active adolescents are also at increased risk of developing this skin-related disorder. Patients usually present with small

papules that are pearly-white or flesh-colored and are characterized by central umbilication. The conjunctiva genital region might also be involved in the manifestations of the condition. However, it was demonstrated that the oral mucosa is usually spared. In most cases, the lesions are countable and attribute to 10 or 20 only. Nevertheless, it was also observed that some cases might develop more frequent lesions that might be up to 100.⁹ Dermatitis might also be associated while molluscum manifests. In patients suffering from atopic dermatitis, evidence indicates that molluscum can rapidly spread across their skin due to the ruptured lesions in these children. In another context, it has been reported that molluscum can influence the development of dermatitis in individuals with apparent healthy skin, and in these cases, the condition is called molluscum dermatitis. Clinical observation and examination of the presenting patient is a critical component before establishing the diagnosis. Evidence indicates that the prognosis of the condition is usually good as the pathology is self-limited in most cases. However, some reports show that the condition manifests for several months and was even observed among some patients for 2-3 years. Furthermore, it should be noted that parents should be furtherly advised to apply gentle skin care products on the skin of their affected children. Treatment options should be introduced to the affected patients in cases when there are concerns regarding the appearance of the affected children. Some of the reported treatment modalities include Aldara (imiquimod), cryotherapy, and intralesional immunotherapy. On the other hand, it should be noted that in cases when dermatitis is associated (whether as a flare-up of the condition or when occurring as molluscum dermatitis) to prevent any further spread of the condition and resolve pruritis.⁹

Scarlet fever

Among children infected with streptococcal tonsillopharyngitis, the prevalence of scarlet fever has been previously demonstrated to be up to 10%.^{10,11} This is usually caused by the erythrogenic toxins (*Streptococcal* pyrogenic exotoxins) that are usually released by specific strains of the group A beta-hemolytic streptococci. Accordingly, scarlet fever and the characteristic rash of the condition usually develop among the affected patients that usually suffer from hypersensitivity as well. The present manifestations among the affected children usually include a sore throat and fever before developing a remarkable rash over the trunk after two or three days. The rash is significantly characterized by a circumoral pallor and usually spreads through the whole body. However, it should be noted that the soles and palms are usually spared. Besides, this rash also has certain characteristics, including the presence of sandpaper-like papules, and blanching, erythematous, fine, and confluent macules that resemble the appearance of a sunburn. Evidence also indicates that a potential presence of non-blanching, erythematous, linear eruptions over the skinfolds of the affected patients, including buttock

creases, antecubital fossa, and the axilla might also be observed. White strawberry tongue is also another significant characteristic and it develops as swollen, erythematous papillae over the tongue that are covered by a white coat, and the presence of some petechiae over the palate. Desquamation of the white coat usually occurs subsequently, leading to the development of a red strawberry tongue. Following this, desquamation of the skin usually occurs as the rash disappears and the general condition of the affected child improves. these events are most frequently observed in the face, feet and hands, and skinfolds, and the condition might last for up to 4-6 weeks.¹² It should be noted that a differential diagnosis should be conducted among these patients to exclude the presence of viral exanthems, which have been observed to develop more slowly. Evidence indicates that conducting throat cultures to identify infections by group A *Streptococcal* is sensitive in 90-95% of the cases. Nonetheless, this approach was also reported to be not widely used.¹³ On the other hand, a previous investigation demonstrated that in clinical settings, rapid antigen tests are usually used, and the estimated sensitivity was 86%.¹⁴ In cases when the rapid antigen test is not diagnostic enough when there is a high index of suspicion for the presence of group A *Streptococcal*, cultures might be indicated in these situations.^{15,16} The management of these cases has been reported to be done by the administering penicillin and cephalosporins while clindamycin and macrolides can be used in children who are allergic to the former modalities.¹⁴

Pityriasis rosea and exanthema subitum (Roseola infantalum)

The main presentation for patients suffering from pityriasis rosea has been described as single rose-colored, oval-shaped patches usually observed over the trunk in eighty percents of the affected cases. A peripheral scale is usually observed for these lesions, usually two to ten cm in diameter, and evidence also indicates that it is also called herald patch.^{17,18} However, these lesions are not the only characteristic of the condition as they usually last for a few weeks only. Following this, evidence indicates that small pink thin papules are usually observed and are similar to the herald patches with a peripheral scale as shown in the Figure 2. As a result of the fine scales, the annular lesions, central clearing, and raised edges, clinicians can misdiagnose the condition with tinea corporis. However, it should be noted that tinea corporis is associated with a single papule is not usually associated with ruptured smaller lesions as in the case with pityriasis rosea. Furthermore, the rash distribution in pityriasis rosea is similar to the Langer lines in Christmas trees, being symmetrical, bilateral, parallel. Evidence also indicates the potential presence of pruritis (as estimated in 50% of the affected cases) and mild upper respiratory tract-related manifestations.¹⁹ In the clinical settings, evidence shows that clinicians can distinguish between tinea infection and other infections from pityriasis rosea by using potassium hydroxide preparations. The rash in

this condition is the usually self-limited as well as the might last for up to two to twelve weeks with the adequate introduction of supportive management modalities based on the underlying symptoms.¹⁹ Some evidence indicates that human herpesvirus six and seven are involved in the etiology which makes it an infectious one. Nonetheless, it is not a solid one and the etiology is probably unknown until the further evidence has been provided.^{17,20}



Figure 2: Pityriasis rosea.

Human herpesvirus six is the main etiology of the exanthema subitum. It has been reported that infants and children >three years old are the most commonly affected.²¹ Abrupt onset of high fever is usually the main characteristic of the disease and evidence indicates that it may last from one to five days. No apparent clinical manifestations are usually observed among the affected children during this period, however, rhinorrhea, mild cough, and diarrhea might be reported in some cases. The erythematous macular and maculopapular rash starts to manifest after the fever subsides and is usually observed at the trunk and starts to spread peripherally as shown in the Figure 3. Measles (Rubeola) should be differentiated from this condition because the two associated rashes are usually similar. However, it has been demonstrated that the rash that is associated with measles spreads from upwards to downwards, starting behind the ears and around the mouth (namely Koplic' spots).²² Furthermore, the general condition of patients with measles is usually more deteriorated than patients with exanthema, and therefore, the condition does not require the administration of any treatment modalities, being self-limited.²³ Many uncommon manifestations were also adequately discussed elsewhere.⁷



Figure 3: Roseola infantum.

CONCLUSION

Establishing a proper diagnosis between the different lesions is essential before making the diagnosis and planning the management approaches. Some of these lesions are usually self-limited. However, some of them might be associated with serious complications if neglected and were not adequately treated. Besides, the prevalence of these conditions seems to be high among the pediatric population, and therefore, planning for future interventional approaches is critical for adequate management and improved general healthcare status.

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REFERENCES

1. Ely JW, Osheroff JA, Ebell MH. Analysis of questions asked by family doctors regarding patient care. *BMJ*. 1999;319(7206):358-61.
2. Fleischer AB Jr, Feldman SR, McConnell RC. The most common dermatologic problems identified by family physicians, 1990-1994. *Family med*. 1997;29(9):648-52.
3. Fleischer AB Jr, Feldman SR, Bullard CN. Patients can accurately identify when they have a dermatologic condition. *J Am Academy Dermatol*. 1999;41(5 Pt 1):784-6.
4. Krowchuk DP, Bradham DD, Fleischer AB Jr. Dermatologic services provided to children and adolescents by primary care and other physicians in the United States. *Pediatr Dermatol*. 1994;11(3):199-203.
5. Pariser RJ, Pariser DM. Primary care physicians' errors in handling cutaneous disorders. A prospective

- survey. *J Am Academy Dermatol*. 1987;17(2 Pt 1):239-45.
6. Norman GR, Rosenthal D, Brooks LR, Allen SW, Muzzin LJ. The development of expertise in dermatology. *Arch dermatol*. 1989;125(8):1063-68.
7. Ely JW, Seabury Stone M. The generalized rash: part I. Differential diagnosis. *Am family physician*. 2010;81(6):726-34.
8. Wolter S, Price HN. Atopic dermatitis. *Pediatr clin N Am*. 2014;61(2):241-60.
9. Brown J, Janniger CK, Schwartz RA, Silverberg NB. Childhood molluscum contagiosum. *Int j dermatol*. 2006;45(2):93-9.
10. Pardo S, Perera TB. Scarlet Fever. In: StatPearls. Treasure Island (FL): StatPearls Publishing, Copyright 2021, StatPearls Publishing LLC. 2021.
11. Leung TN, Hon KL, Leung AK. Group A *Streptococcus* disease in Hong Kong children: an overview. *Hong Kong med j*. 2018;24(6):593-601.
12. Maniscalco J, Dryer AL, Marks A. Index of suspicion. *Pediatrics in review*. 2008;29(9):321-8.
13. Wong SS, Yuen KY. *Streptococcus pyogenes* and re-emergence of scarlet fever as a public health problem. *Emerging microbes infections*. 2012;1(7):e2.
14. Shulman ST, Bisno AL, Clegg HW. Clinical practice guideline for the diagnosis and management of group A streptococcal pharyngitis: 2012 update by the Infectious Diseases Society of America. *Clin infectious diseases*. 2012;55(10):e86-102.
15. Lean WL, Arnup S, Danchin M, Steer AC. Rapid diagnostic tests for group A streptococcal pharyngitis: a meta-analysis. *Pediatrics*. 2014;134(4):771-81.
16. Cohen JF, Bertille N, Cohen R, Chalumeau M. Rapid antigen detection test for group A streptococcus in children with pharyngitis. *Cochrane database of systematic reviews*. 2016;7(7):Cd010502.
17. González LM, Allen R, Janniger CK, Schwartz RA. Pityriasis rosea: an important papulosquamous disorder. *Int j dermatol*. 2005;44(9):757-64.
18. Browning JC. An update on pityriasis rosea and other similar childhood exanthems. *Curr opinion pediatr*. 2009;21(4):481-5.
19. Contreras-Ruiz J, Peternel S, Jiménez Gutiérrez C, Culav-Koscak I, Reveiz L, Silbermann-Reynoso ML. Interventions for pityriasis rosea. *Cochrane database systematic reviews*. 2019;2019(10).
20. Drago F, Broccolo F, Rebora A. Pityriasis rosea: an update with a critical appraisal of its possible herpesviral etiology. *J Am Academy Dermatol*. 2009;61(2):303-18.
21. Yamanishi K, Okuno T, Shiraki K. Identification of human herpesvirus-6 as a causal agent for exanthem subitum. *Lancet (London, England)*. 1988;1(8594):1065-7.
22. Lampell M, Mace S, Whiteman P, Objectives C. Childhood Rashes That Present To The ED Part I: Viral And Bacterial Issues. 2007.
23. Stoeckle MY. The spectrum of human herpesvirus 6 infection: from roseola infantum to adult disease. *Annual review med*. 2000;51:423-30.

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