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CASE REPORT

Pityriasis rosea possibly induced by HPV vaccine: A case report

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Abstract: Pityriasis rosea (PR) is an acute, self-limiting skin disorder that begins with a "herald patch" followed by smaller erythematous lesions, often arranged in a "Christmas tree" pattern. Although its cause remains uncertain, reactivation of human herpesviruses 6 and 7 is considered a likely trigger. Several reports have also described PR following vaccination, suggesting immune activation as a contributing factor. We describe a 36-year-old woman who developed PR-like lesions six weeks after receiving the GARDASIL® quadrivalent HPV vaccine. She presented with a mildly pruritic rash on her trunk, beginning with a single lesion on the upper back. Examination showed erythematous, scaly plaques with collarette scaling, characteristic of PR. The temporal association between vaccination and rash onset suggested the HPV vaccine as a probable trigger. She was treated with oral valacyclovir, prescribed for possible viral reactivation, and topical mometasone furoate for inflammation and itching. The eruption resolved completely within two weeks. The proposed mechanism involves T cell–mediated immune dysregulation, possibly through reactivation of latent herpesviruses or a cross-reactive inflammatory response. Only two previous cases of PR following HPV vaccination have been reported. This case supports a potential association between HPV immunization and PR-like eruptions. .

Keywords: Pityriasis rosea, human herpesviruses, HPV vaccination.

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1 Introduction

Pityriasis rosea (PR) is an acute, self-limited papulosquamous eruption that predominantly affects the trunk and proximal extremities, commonly seen in adolescents and young adults. The rash typically starts with the appearance of a large, solitary lesion known as the "herald patch," followed by smaller erythematous patches or plaque 1-2 weeks later. These secondary lesions are associated with peripheral collarette scaling distributed along the skin's natural cleavage lines, exhibiting a Christmas tree pattern [1]. Recent studies suggest that reactivation of human herpesvirus 6 and human herpesvirus 7 may contribute to the development of these skin lesions. Additionally, there have been reports of PR occuring after the initiation of new medications and, less commonly, various vaccinations, implicating immune system activation as a potential trigger [2–4]. Notably, reports of PR specifically linked to the HPV vaccine are exceedingly rare. To the best of our knowledge, only two such cases have been documented in the medical literature to date [5]. Furthermore, the mechanistic data linking the HPV vaccine to PR eruptions are limited and remain largely anecdotal, highlighting a significant gap in our understanding of this potential adverse event.

Herein, we report a detailed case of PR with a close temporal association to quadrivalent HPV vaccination, contributing a third instance to this sparse collection of cases and discussing the plausible immunological mechanisms involved.

2 Case Presentation

A 36-year-old woman, not known to have any medical diseases, presented to the dermatology clinic for the follow-up of genital warts. During the visit, she complained of a rash on the trunk that had been present for 1 month. She reported an initial solitary lesion on the left upper back, subsequently

followed by the appearance of a mildly pruritic rash on the trunk. The rash started to appear 6 weeks after she received the first dose of GARDASIL® [Human Papillomavirus Quadrivalent (Types 6, 11, 16, and 18), Recombinant] vaccine. She was otherwise asymptomatic following the vaccination and denied experiencing any symptoms such as fever, chills, headache, or myalgia. She denied any recent upper respiratory tract infections or recent illnesses, new medications, or any relevant medical, surgical, family, or social history.

Physical examination revealed multiple oval-to-round, erythematous scaly plaques with collarette scales over the trunk, variable in size, distributed along the cleavage lines of the trunk (Figure 1). Skin biopsy was not obtained. Serology for HHV-6 DN, HHV-7 DNA, and HHV-8 DNA through genomic amplification (PCR) was conducted nearly 10 weeks after the onset of rash, all of which returned negative results. Due to the significant correlation between vaccination and onset of rash, HPV vaccination was the most likely etiology. The patient was reassured about the benign and self-limiting nature of the eruption and was prescribed Valacyclovir 500 mg three times a day and mometasone cream twice a day for seven days. She was scheduled for a follow-up appointment after 2 weeks with complete resolution of the rash.

3 Discussion

Pityriasis rosea (PR) is a prevalent, self-resolving skin condition marked by distinctive lesions, starting with a herald patch and followed by additional eruptions that often create a "Christmas tree" pattern on the torso. Although it is common and easily identifiable, the exact cause of PR is still unknown. Human herpesviruses (HHV) 6 and 7 have been suggested as possible contributors to its development, with indications that viral reactivation might trigger the condition. The exact mechanism behind the onset of PR following vaccination is unclear. It's possible that the immune response triggered by vaccination could lead to the reactivation of dormant viruses like HHV-6 or HHV-7, resulting in PR [6,7]. Another theory suggests a cell-mediated immune response may occur due to molecular mimicry involving a viral epitope, but there is currently no supporting evidence to confirm this idea [8]. While the association between HPV vaccination and Pityriasis rosea is rare, there have been multiple reports of similar skin reactions occurring following other vaccines, such as those for influenza and COVID-19. Case studies have recorded occurrences of PR, along with other cPR-like skin eruptions, following a range of vaccinations, including Bacillus Calmette-Guérin (BCG), influenza, polio, H1N1, diphtheria-pertussis-tetanus, smallpox, Hepatitis B, pneumococcus, and COVID-19 [9–12]. Papakostas et al. suggested that vaccines may initiate a T-cell-mediated response, which in turn could reactivate the pathogen. It has been proposed that the pathophysiology of Pityriasis rosea (PR) is mainly driven by T-cells, as indicated by the increase of T-cells and the absence of natural killer (NK) cells and B-cells in PR lesions. Additionally, the detection of anti-immunoglobulin M (IgM) keratinocytes in patients with PR further supports the idea that this immune response contributes to the clinical manifestations of the condition [13].

In our patient, a causal relationship is highly suggestive as the skin rash developed within 6 weeks of vaccination. The patient also presented with highly itchy lesions. The drug eruption had some similarities with typical PR, which had a herald patch and erythematous maculopapular eruptions with collarette scales, although it did not have the classic "Christmas tree" distribution. The lesions were not purpuric or bullous, not refractory, and did not evolve into lichenoid dermatitis. Using Naranjo's method for assessing the likelihood of drug reactions, the score in our case is 4, suggesting a possible association between the HPV vaccine and PR. To the best of our knowledge, there have been only two reported cases of HPV vaccination associated with PR in the published literature. We present this rare case of PR-like eruptions following HPV vaccination, suggesting a possible association with the vaccine. In light of the proposed involvement of human herpesvirus reactivation in the etiology of Pityriasis rosea, our patient received an empirical treatment regimen consisting of oral valacyclovir at a dosage of 500 mg administered three times daily for a duration of seven days. This antiviral medication functions by inhibiting herpesvirus replication, and its use was grounded in the premise that reducing potential viral triggers may alleviate the progression of the condition. Simultaneously, topical mometasone furoate cream was recommended due to its anti-inflammatory and antipruritic properties, aimed at providing symptomatic relief for the rash. Notably, the patient achieved complete remission of the rash within two weeks of commencing this combined therapeutic approach, highlighting the effectiveness of the selected treatment protocol in this particular case.

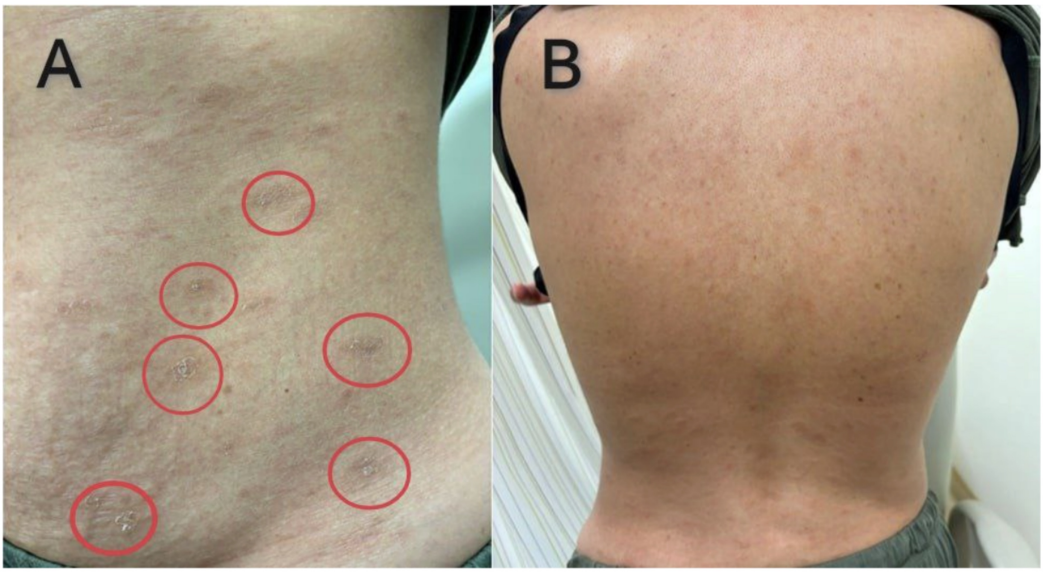

Figure 1. Pityriasis Rosea-like Eruption Following HPV Vaccination. (A) Multiple oval-to-round, erythematous scaly plaques with characteristic trailing collarette scales on the trunk. Red circles highlight representative lesions. (B) Widespread distribution of lesions across the patient's back.

4 Conclusion

Future research needs to include viral detection early after symptom onset (e.g., quantitative PCR for HHV-6/7) and rigorous immunopathological examinations on skin biopsies to establish causality more firmly and to clarify vaccine-induced Pityriasis rosea's immune mechanisms. Such studies will inform prevention strategies and targeted therapies. This case report reveals an unusual association of HPV vaccine with PR pattern eruptions, emphasizing the importance of considering vaccine-related adverse events and contributing to the understanding of PR's diverse triggers.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Ethical Statement

Written informed consent was obtained from the patient to be included in this study. Institutional review board (IRB) approval from King Fahad Medical City (KFMC) was also obtained

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