



10.2478/AMB-2026-0061

CASE REPORT

FEBRILE MACULOPAPULAR EXANTHEM ASSOCIATED WITH INFLUENZA A SUBTYPE H3N2 VIRAL INFECTION: A RARE MANIFESTATION AND A REVIEW OF THE LITERATURE

B. Koyutourk¹, E. Direnç², M. Ergören³, H. Sürer²

¹Near East University, Faculty of Medicine, Department of Medical Microbiology and Clinical Microbiology – Nicosia, Cyprus

²Near East University, Faculty of Medicine, Department of Infectious Diseases and Clinical Microbiology – Nicosia, Cyprus

³Near East University Hospital, Molecular Microbiology Laboratory – Nicosia, Cyprus

Abstract. Background: Influenza A-associated cutaneous manifestations are rare in adults and are poorly characterized, especially in infections, due to seasonal H3N2 strains. Awareness of influenza-related exanthems is clinically important because misdiagnosis may delay antiviral therapy and broaden unnecessary investigations. **Case presentation:** We report a case of a previously healthy 21-year-old man presenting with high-grade fever, pharyngitis, non-pruritic maculopapular rash, and pronounced lymphopenia. An influenza A/H3N2 infection was identified by rapid antigen testing and multiplex respiratory PCR. Further investigation ruled out other viral and bacterial infections, as well as medications, as a cause of the exanthem. He had a rapid clinical improvement with oseltamivir therapy, with complete resolution of fever and significant regression of rash by day 5. **Discussion:** Adult-onset maculopapular exanthems associated with influenza A infection are rare and might closely resemble other viral exanthems, hypersensitivity reactions, or streptococcal diseases. This case broadens the dermatologic spectrum of influenza A/H3N2 and highlights the need to consider influenza as a cause of febrile rash syndromes during epidemic seasons. Review of the literature shows limited, but consistent, documentation of similar presentations, mainly attributed to H1N1 strains. **Conclusion:** Influenza A/H3N2 infection should be considered in the differential diagnosis of acute febrile maculopapular rash in adults. Early antiviral therapy may promote rapid clinical improvement and avoid unnecessary procedures. This case underscores the need for greater recognition of dermatologic manifestations related to influenza infection in order to enhance diagnostic precision and patient care.

Key words: influenza A, H3N2, maculopapular exanthem, viral rash, febrile illness, oseltamivir

Corresponding author: Behich Koyutourk, Near East University, Faculty of Medicine, Department of Medical Microbiology and Clinical Microbiology, Nicosia 99138, TRNC, email: behic.koyuturk@neu.edu.tr

ORCID: 0009-0009-8278-9394

Received: 19 December, **Revised/Accepted:** 04 April 2026

INTRODUCTION

Influenza A viruses are enveloped, negative-sense, single-stranded RNA viruses belonging to the *Orthomyxoviridae* family. They are characterized by two major surface glycoproteins, hemagglutinin (HA) and neuraminidase (NA), which undergo frequent antigenic drift and occasional antigenic shift, leading to recurrent seasonal epidemics and occasional pandemics. Among influenza A subtypes, H3N2 viruses have been particularly associated with significant morbidity in adults due to their rapid evolutionary dynamics and reduced vaccine effectiveness in recent years. In adults, influenza A infection typically manifests as an acute febrile upper respiratory tract illness, but complications are not uncommon. Severe pneumonia, acute respiratory distress syndrome (ARDS), secondary bacterial infections, and cardiovascular events have all been reported, with hospitalization rates and mortality increasing with age and comorbidities. Epidemiological data suggest that seasonal influenza epidemics result in 3–5 million cases of severe disease and up to 650,000 deaths globally each year [1, 2].

Cutaneous manifestations of influenza are rare but have been documented. Reported rash types include maculopapular, urticarial, and morbilliform eruptions, occurring in both pediatric and adult populations. The prevalence of rash in influenza A infection is estimated to be below 2%, with higher rates observed in children than in adults [3]. In adults, maculopapular rashes are more commonly associated with other infections, such as the Epstein–Barr virus, the West Nile virus, the Zika virus, rubella, parvovirus B19, as well as tick-borne illnesses and hypersensitivity reactions, making influenza-related rash an unusual diagnostic consideration [4].

The coexistence of pharyngitis and rash in adults reaches a broad differential diagnosis, including streptococcal pharyngitis with scarlatiniform rash, adenovirus infection, and viral pathogens [5]. Therefore, recognition of influenza A as a potential cause of maculopapular rash in adults is clinically relevant, particularly in the context of seasonal epidemics. Management of influenza A infection relies on early initiation of neuraminidase inhibitors, such as oseltamivir, which have been shown to reduce disease duration and complications when administered promptly. Preventive strategies remain centered on annual vaccination, although vaccine effectiveness against H3N2 strains has been variable due to antigenic drift [6, 7]. Public health measures, including surveillance and rapid diagnostic testing, are essential to mitigate the burden of disease.

This case report aims to contribute to the scientific literature by highlighting the diagnosis and management of maculopapular rash associated with influenza A infection – an uncommon clinical presentation in adults.

MATERIALS AND METHODS

A literature review of previously reported cases of influenza-associated exanthems was conducted. The search was carried out in PubMed, Scopus, and Google Scholar from the date of inception until December 2025, using a combination of keywords and Boolean operators such as “influenza rash,” “influenza A maculopapular,” “influenza exanthem,” “H3N2 rash,” “viral exanthem influenza,” and “pandemic H1N1 rash.” The inclusion criteria were: (i) the search must include case reports or case series, (ii) there must be a laboratory-confirmed influenza infection, (iii) there must be a description of cutaneous manifestations, and (iv) the research documents should be in the English language. Reference lists of included articles were manually searched for additional publications. This strategy yielded a few reports of adults due to the rarity and underrecognition of dermatologic presentations of influenza infection.

CASE PRESENTATION

A 21-year-old male presented to the emergency department with complaints of fever, sore throat, and rash of two days' duration. He reported no history of chronic illness, medication use, drug allergy, or recent travel. On physical examination, the patient was febrile, with a temperature of 39.2 °C. A generalized maculopapular eruption was noted, predominantly on the dorsum, with a tendency to coalesce. The lesions were non-pruritic. Respiratory sounds were normal, and the remainder of the systemic examination was unremarkable. The pharynx appeared hyperemic, and the patient had a nonproductive cough. Thus, post-nasal drip was found. However, there were no signs of tonsillitis or tonsillar crypts. In spite of the absence of a focus for sepsis, the presence of fever led to a septic workup. Blood cultures were drawn from two different veins in four different sets, including aerobic and anaerobic cultures, as well as a urine culture. No growth was found in the culture media.

Microbiological examination of throat secretions was performed, revealing no pathogenic bacterial growth and only rare normal flora. Additionally, initial laboratory evaluation demonstrated a white blood cell (WBC) count of $8.3 \times 10^3/\mu\text{L}$ (reference: $4\text{--}10 \times 10^3/$

μL) with marked neutrophilia (87.9%, absolute neutrophil count $7.2 \times 10^3/\mu\text{L}$) and profound lymphopenia (absolute lymphocyte count $0.36 \times 10^3/\mu\text{L}$). C-reactive protein (CRP) was elevated at 2.37 mg/dL (normal range: < 0.5 mg/dL), while procalcitonin (PCT) remained within normal limits (Figure 1a and 1b). The erythrocyte sedimentation rate (ESR) was mildly increased at 20 mm/h. Alanine Aminotransferase, Aspartate Aminotransferase, Blood Urea Nitrogen, Creatinine, and electrolytes were all within normal reference ranges.

Furthermore, a rapid antigen combo test by Microcult (Hangzhou AllTest Biotech Co., Ltd.), performed in the emergency department, was negative for SARS-CoV-2, respiratory syncytial virus (RSV), adenovirus, and influenza B, but positive for influenza A. This finding was subsequently confirmed using a fully integrated syndromic molecular assay performed with the QIAstat-Dx Respiratory SARS-CoV-2 Panel on the QIAstat-Dx Analyser 1.0 (Qiagen, Germany), which detected influenza A/H3, while all other respiratory pathogens included in the panel were negative. Additionally, serological testing for viral exanthematous diseases was negative, including Parvovirus B19 IgM, HIV Ag/Ab, Rubella IgM, Cytomegalovirus

(CMV) IgM, Epstein–Barr virus (EBV) IgM, Treponema pallidum hemagglutination assay (TPHA), and Measles (Rubeola) IgM. Weil–Felix testing for rickettsial infections was also negative. Rapid streptococcal antigen testing and antistreptolysin O (ASO) titers were within reference limits, excluding scarlet fever.

The patient was treated with oseltamivir (75 mg orally twice daily) and supportive therapy, including intravenous paracetamol (1,000 mg three times daily) for fever control, 0.9% NaCl infusion (2,000 mL/day) for hydration, and pantoprazole (40 mg intravenously once daily) for gastric protection. No antibiotic therapy was initiated, as there was no evidence of bacterial superinfection. The patient showed clinical improvement under this regimen. Afterwards, on day 2 of hospitalization, the WBC count remained within normal limits, fever persisted around 38 °C, and the rash showed partial regression. CRP increased to 4.02 mg/dL, while PCT remained normal. By day 3, the patient became afebrile, the rash continued to regress, CRP decreased to 3.38 mg/dL, and PCT remained normal. A relative monocytosis was noted (absolute monocyte count $1.40 \times 10^3/\mu\text{L}$, 14.2%). On day 5, the patient remained afebrile, the rash had further regressed (Figure 2), CRP decreased to

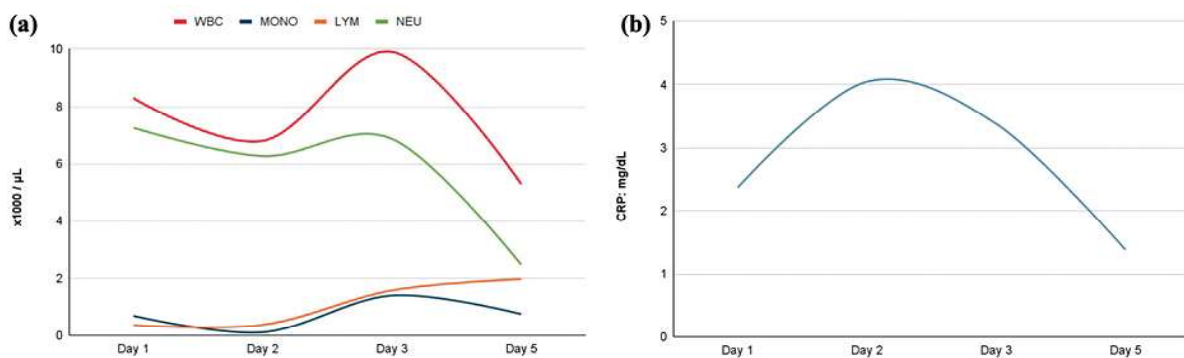


Fig. 1. (a) Serial measurements of white blood cell (WBC) counts, including neutrophils, monocytes, and lymphocytes, recorded throughout the course of hospitalization. (b) C-reactive protein (CRP) levels were monitored during the same treatment period

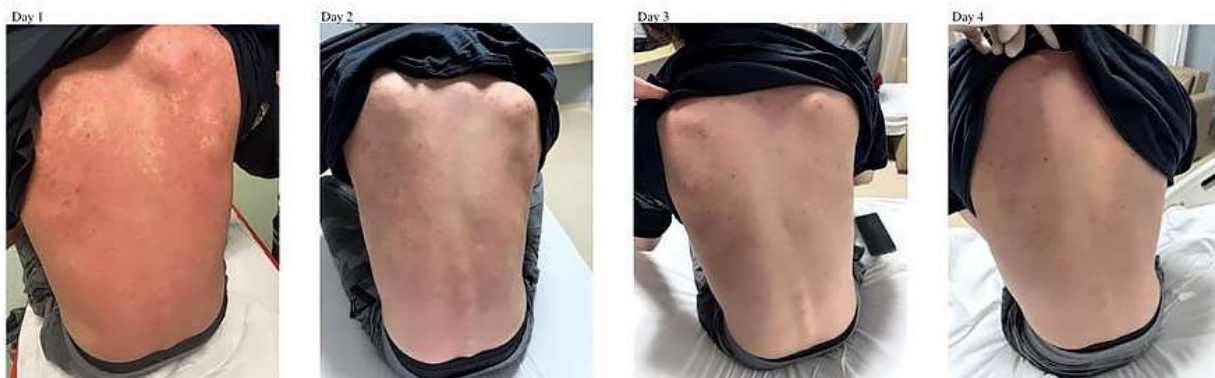


Fig. 2. Clinical appearance of the patient's maculopapular rash involving the dorsum, demonstrating changes in morphology and distribution under treatment: day one, day two, day three, and day four, respectively

1.38 mg/dL, PCT remained normal, and complete blood count parameters were within reference ranges, except for continuing monocytosis. The patient's clinical condition improved steadily, and he was discharged in good health after the fever resolved and the rash showed significant regression.

DISCUSSION

Cutaneous manifestations of influenza virus infection are rare and often underrecognized, particularly in adults. While influenza A and B viruses are primarily associated with acute febrile respiratory illness, sporadic reports have documented dermatologic involvement, including maculopapular and petechial eruptions, especially in the pediatric population [13]. Viral infections can also provoke systemic immune dysregulation beyond their primary target organs. As demonstrated in SARS-CoV-2 infection, hyperimmune activation and cytokine-mediated damage may result in complications, such as encephalopathy and inflammatory demyelination [14]. Although such manifestations are uncommon in influenza, similar immunological mechanisms, including cytokine imbalance and vascular inflammation, may contribute to extrapulmonary findings such as cutaneous eruptions, suggesting these are driven by immune responses rather than direct viral effects.

Based on that, the present case illustrates a maculopapular exanthem accompanied by pharyngitis in an adult patient with confirmed influenza A infection, thereby expanding the clinical spectrum of influenza-associated presentations.

Influenza in the spectrum of viral exanthems

Maculopapular rashes are more commonly attributed to measles, rubella, parvovirus B19, Epstein–Barr virus, cytomegalovirus, and arboviruses, such as Zika and West Nile. In contrast, influenza A-related exan-

thems are estimated to occur in less than 2% of adult cases, with influenza B implicated even more rarely in the literature [9, 15, 16]. Nevertheless, both influenza A and B should be considered in the differential diagnosis of febrile exanthematous illnesses, particularly during epidemic seasons. Misdiagnosis as drug hypersensitivity or alternative viral exanthems may lead to delayed antiviral treatment and inappropriate clinical management.

Comparative analysis with previous reports

Our findings share important similarities and differences with prior case reports (Table 1). Compared with these reports, our case is distinguished by: subtype context; H3N2 rather than pandemic H1N1 clinical profile; prominent pharyngitis and cough, absent ocular or gastrointestinal involvement, morphology; non-petechial and maculopapular, laboratory: lymphopenia, neutrophilia, and CRP course, comprehensive serological and microbiological differential diagnosis; excluding other exanthematous viruses and bacterial causes, strengthening attribution to influenza A/H3N2. All reports converge on the recognition that influenza can present with atypical cutaneous features and should be included in the differential diagnosis of febrile rash syndromes.

Therapeutic implications

Early administration of neuraminidase inhibitors, particularly oseltamivir, remains the cornerstone of influenza management. Randomized controlled trials have demonstrated that oseltamivir reduces symptom duration, viral shedding, and complications when initiated promptly [17]. In our patient, oseltamivir therapy was temporally associated with rapid defervescence, regression of rash, and normalization of inflammatory markers, mirroring favorable outcomes reported in the aforementioned cases.

This report has several strengths: comprehensive diagnostic workup with fully integrated syndromic molecular assay, extensive serological testing, exclu-

Table 1. Literature review of previously reported Influenza A-related exanthems

Case	Virus subtype	Rash morphology	Therapy	Age group
Rosenberg et al., 2010 (CMAJ) [3]	A (H1N1)	Maculopapular	Oseltamivir	Adult
Koul et al., 2013 (Case Reports) [8]	A (H1N1)	Maculopapular	Oseltamivir	Adult
Fretzayas et al., 2011 (Children) [9]	A (H1N1)	Maculopapular	Oseltamivir	Pediatric
Shachor-Meyouhas & Kassis, 2010 (Pediatr Inf Dis J) [10]	A (H1N1)	Petechiae	Oseltamivir	Pediatric
Huber et al., 2010 (Intensive Care Med) [11]	A (H1N1)	Maculopapular	Oseltamivir	Adult
Urso et al., 2011 (J Med Case Reports) [12]	A (H1N1)	Purpura	Oseltamivir	Adult
CDC, 2012 (MMWR, Ohio H3N2v) [15]	A (H3N2)	Not specified	Not specified	Mixed

sion of common viral and bacterial exanthems, and sequential laboratory monitoring correlating with clinical evolution. The photographic documentation also carries the visual characterization of the rash and its resolution. Moreover, in our case, the microbiological examination of throat secretions did not confirm the growth of pathogenic bacteria, which points towards a viral etiology of the infection, although neutrophilia was present. This example shows again that hematologic findings like neutrophilia can occur in viral infections as well [18]. On the other hand, limitations include a lack of skin biopsy, which, though seldom performed in uncomplicated viral exanthems, might have provided further histopathological details. Furthermore, findings are related to only one patient, which restricts generalization. Long-term follow-up was not possible. However, the patient was discharged with complete remission.

CONCLUSION

This is a case report about an unusual presentation of influenza A/H3N2 infection in the form of a febrile maculopapular exanthem in a young adult. While influenza is often considered a pure respiratory pathogen, clinicians must be aware of its atypical dermatological manifestations. The inclusion of influenza into the differential diagnosis of the febrile rash syndromes, especially in the epidemic seasons, can avoid misdiagnosis and enable early antiviral therapy. Our case findings, supplemented by a targeted literature review, broaden the clinical spectrum of influenza-associated exanthems and emphasize the value of recognizing cutaneous involvement in optimizing patient outcomes.

Conflict of Interest Statement: *The authors declare no conflicts of interest related to this work.*

Funding: *The authors did not receive any financial support from any organization for this research work.*

Ethical statement: *This study has been performed in accordance with the ethical standards as laid down in the Declaration of Helsinki.*

Consent for publication: *Consent form for publication was signed by the patient and collected.*

REFERENCES

1. Uyeki TM, Hui DS, Zambon M, et al. Influenza. *The Lancet*. 2022;400(10353):693-706.
2. Fall A, Han L, Yunker M, et al. Evolution of Influenza A (H3N2) viruses in 2 consecutive seasons of genomic surveillance, 2021–2023. *Open Forum Infect Dis*. 2023; 10(12):ofad577.
3. Rosenberg M, Tram C, Kuper A, Daneman N. Rash associated with pandemic (H1N1) influenza. *CMAJ*. 2010;182(3):E146.
4. Muzumdar S, Rothe MJ, Grant-Kels JM. The rash with maculopapules and fever in adults. *Clin Dermatol*. 2019;37(2):109-118.
5. Flores AR, Caserta MT. Pharyngitis. In: Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 2014. p. 753.
6. Belongia EA, McLean HQ. Influenza vaccine effectiveness: defining the H3N2 problem. *Clin Infect Dis*. 2019;69(10):1817-1823.
7. Murray J, Martin DE, Sancilio FD, Tripp RA. Antiviral activity of probenecid and oseltamivir on influenza virus replication. *Viruses*. 2023;15(12):2366.
8. Koul PA, Khan UH, Shah TH, Bagdadi F. Skin rash and subconjunctival haemorrhage in an adult with pandemic H1N1 influenza. *BMJ Case Rep*. 2013;2013:bcr2013010216.
9. Fretzayas A, Moustaki M, Kotzia D, Nicolaidou P. Rash, an uncommon but existing feature of H1N1 influenza among children. *Influenza Other Respir Viruses*. 2011;5(4):223.
10. Shachor-Meyouhas Y, Kassis I. Petechial rash with pandemic influenza (H1N1) infection. *Pediatr Infect Dis J*. 2010;29(5):480.
11. Huber LC, Kamarachev J, Maggiorini M, Müller V. Skin rash in a patient with A(H1N1) infection. *Intensive Care Med*. 2010;36(10):1793-1794.
12. Urso R, Bevilacqua N, Gentile M, et al. Pandemic 2009 H1N1 virus infection associated with purpuric skin lesions: a case report. *J Med Case Rep*. 2011;5(1):132.
13. Martini L, Feszak I, Brzeziński P. AH3N2 influenza: dermatological manifestations and the role of topical natural remedies in treatment. *Our Dermatol Online*. 2025;16(e):e10.
14. Metodiev D, Toshev Y, Anachkov K, et al. Three cases of encephalopathy/disseminated encephalomyelitis in SARS-CoV-2 infection. *Acta Med Bulg*. 2022;49(1):51-56.
15. Centers for Disease Control and Prevention (CDC). Influenza A (H3N2) variant virus-related hospitalizations – Ohio, 2012. *MMWR Morb Mortal Wkly Rep*. 2012;61(38):764-767.
16. Skowronski DM, Chambers C, Osei W, et al. Case series of rash associated with influenza B in school children. *Influenza Other Respir Viruses*. 2015;9(1):32-37.
17. Dobson J, Whitley RJ, Pocock S, Monto AS. Oseltamivir treatment for influenza in adults: a meta-analysis of randomised controlled trials. *The Lancet*. 2015;385(9979):1729-1737.
18. George ST, Lai J, Ma J, et al. Neutrophils and influenza: a thin line between helpful and harmful. *Vaccines*. 2021;9(6):597.