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## Nursing Care of Allopurinol-Induced Toxic Epidermal Necrolysis in a Gout Patient: A Postprint

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### Abstract

This article collected and compiled clinical data from one patient with toxic epidermal necrolysis, summarized the clinical nursing protocol, and explored the nursing protocol for severe drug eruption caused by oral allopurinol. Oral allopurinol can readily induce toxic epidermal necrolysis, a severe drug hypersensitivity reaction. While optimizing disease monitoring, skin care, and mucosal care, it is essential to enhance patient health education and psychological nursing to facilitate recovery.

### Full Text

## Nursing Care of a Gout Patient with Toxic Epidermal Necrolysis Induced by Oral Allopurinol

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### Abstract

This paper reviews the clinical data and nursing management of a patient with toxic epidermal necrolysis (TEN) to investigate optimal nursing protocols for severe drug eruptions caused by oral allopurinol. Allopurinol is a frequent cause of severe drug eruptions such as toxic epidermal necrolysis. In addition to careful monitoring of disease progression, skin care, and mucosal care, health education and psychological support are essential to promote patient recovery and improve outcomes.

**Keywords:** toxic epidermal necrolysis; severe drug eruption; skin care; allopurinol

## Introduction

Drug eruption refers to systemic skin and mucosal reactions caused by drugs entering the body through oral, injection, inhalation, or topical routes, representing the most common type of allergic reaction. Drug eruptions are classified as mild, moderate, or severe based on the severity of skin lesions. Severe drug eruptions are often accompanied by fever, dehydration, and infection, with extensive damage to skin and mucosa. In the early stage, erythematous rashes appear on the skin without mucosal involvement, while in the advanced stage, severe necrosis, ulceration, and inflammatory exudation of skin and mucosa may involve ocular, oral, and perineal mucosal tissues, potentially leading to blindness and oral ulceration.

Allopurinol, a xanthine oxidase inhibitor commonly used to treat gout and hyperuricemia, blocks the metabolism of hypoxanthine and xanthine to uric acid, thereby reducing uric acid production and lowering serum uric acid concentration. Common adverse reactions include gastrointestinal symptoms, leukopenia, thrombocytopenia, fever, and rash. In clinical nursing practice, early detection and intervention are crucial for allopurinol-induced adverse drug reactions.

## 1. Clinical Data

**1.1 Case Presentation** The patient was a gout sufferer who had been regularly taking febuxostat and allopurinol for several weeks before developing oral ulcers, which were not initially considered significant. The patient subsequently experienced sore throat, self-measured fever, and bilateral conjunctival congestion without obvious cough, sputum, nasal congestion, chest tightness, chest pain, urinary urgency, dysuria, diarrhea, or abdominal pain. Laboratory tests revealed elevated white blood cells and neutrophils, mild liver dysfunction, and abnormal chest CT findings. The patient was prescribed cephalosporins and acetaminophen tablets (Sanli Tong). On the same night, the patient developed generalized congestive rash, prompting a diagnosis of severe drug eruption. Intravenous methylprednisolone, immunoglobulin, and ertapenem were administered with fluid replacement.

**1.2 Hospital Course** Upon transfer to our hospital, the patient exhibited widespread bullae formation with rupture, skin detachment, oral mucosal congestion, edema and erosion, bilateral conjunctival congestion, and high fever (temperature fluctuating around  $^{\circ}\text{C}$ ). The patient was admitted and placed on fasting status, received oxygen therapy, and had intake and output meticulously recorded. Red light irradiation therapy was initiated. Antibiotic therapy (ertapenem, methylprednisolone) was continued, along with pantoprazole sodium for gastric mucosal protection, intravenous calcium gluconate, and supplementation with water-soluble vitamins, potassium chloride, and glucose.

## 2. Nursing Care

**2.1 Skin Care** The patient had extensive skin breakdown with significant exudate. Daily wound cleaning with normal saline was performed using gentle technique without forceful wiping, while maintaining warmth to prevent chilling. Necrotic epithelium was trimmed with sterile scissors. Recombinant human epidermal growth factor solution was sprayed on newly regenerated skin to promote epithelialization. Soiled linens were promptly changed to prevent pressure ulcer formation. Personal hygiene was maintained through regular nail and hair trimming.

Red and blue light therapy was administered using a phototherapy unit at a distance of cm with a spot size of cm<sup>2</sup> for minutes per session, twice daily. Patients wore protective goggles during treatment. Following irradiation, sterile gauze soaked in compound phellodendron solution was applied as a wet dressing to affected areas.

The patient was placed in a single-room ward for protective isolation. Room temperature was maintained at °C with relative humidity at %-55%. The floor was disinfected with chlorine-containing disinfectant at mg/L, and ultraviolet air disinfection was performed twice daily with regular ventilation. Soft, comfortable bedding and an air mattress were used to prevent excessive local pressure. Given severe skin lesions and abundant scaling, bed-making frequency was increased to ensure cleanliness.

**2.2 Mucosal Care** **Oral Care:** The patient had severe oral mucosal ulceration with extensive mucosal sloughing, which was trimmed with sterile scissors when present. For lips with blood crusts causing difficulty in mouth opening, normal saline gauze compresses were applied while encouraging mouth-opening exercises. Normal saline or % sodium bicarbonate solution was used for mouth rinsing. Pantoprazole sodium was administered to protect gastric mucosa.

**Ocular Care:** Patients with severe drug eruption often develop severe ocular congestion, edema, and conjunctival adhesions. Ocular secretions were cleaned using aseptic technique. Daily eye irrigation with normal saline and application of aureomycin eye ointment were performed, with encouragement of eye-opening exercises to prevent conjunctival adhesion.

**Perineal Care:** Caregivers were educated to clean the perineal and perianal area promptly after urination or defecation without forceful wiping, using soft towels to maintain cleanliness and dryness. Normal saline gauze compresses were applied to reduce urine-related skin irritation.

**2.3 Monitoring and Supportive Care** Vital signs were closely monitored with temperature checks every hours during fever episodes. Physical cooling measures or antipyretic patches were applied as ordered, with effectiveness observed. The patient was encouraged to drink warm water and maintain warmth.

Warm water sponge baths were performed with gentle technique to avoid mucosal bleeding. Ice packs were applied to the forehead, axilla, and groin (avoiding the occiput, auricles, precordium, abdomen, scrotum, and soles). Antipyretics such as indomethacin suppositories and acetaminophen sustained-release tablets (Tylenol) were administered as prescribed. Intake and output were accurately recorded every hours.

Glucocorticoids are the first-line treatment and must be administered in adequate doses. However, adverse reactions increase with dosage and require vigilant monitoring for altered consciousness or mental status, with prompt physician notification. Before procedures, disposable gloves were worn and removed immediately afterward with hand hygiene. Intravenous access was established at intact skin sites using indwelling needles for less than hours, secured with hypoallergenic tape. Thermometers, sphygmomanometers, and tourniquets were dedicated for single-patient use with terminal disinfection after use.

**2.4 Nutritional Support** Due to severe mucosal ulceration, the patient was kept on fasting status with nutritional support provided via intravenous fluids. During recovery, new epidermal regeneration and extensive crust shedding occurred. Patients were instructed not to forcibly remove crusts or scratch pruritic new skin. Nails were trimmed regularly, and shed crusts were promptly removed from bedding.

**2.5 Psychological Care** Severe drug eruption has acute onset with rapid progression, causing fever, extensive skin damage, varying degrees of vision loss, and often accompanied by inferiority complex, anxiety, fear, and pessimism. Nursing staff communicated with the patient, listened patiently, provided comfort, and encouraged confidence in overcoming the disease. Family members were also engaged to provide emotional support. Through counseling and encouragement, the patient achieved emotional stability and cooperated actively with treatment.

**2.6 Health Education** Drug eruption is an iatrogenic disease where prevention is paramount. Before discharge, responsible nurses thoroughly explained the specific drug allergy and potential cross-reactive agents to avoid future use. Patients were instructed to remember the allergenic drug name and actively inform physicians during every medical visit. Compound preparations containing known allergens should also be avoided. During early post-discharge period when immunity is compromised, patients should rest, enhance nutrition, avoid chilling, and avoid public places to reduce upper respiratory infection risk. Any sudden onset of rash, pruritus, or fever during medication requires immediate discontinuation and prompt medical attention.

### 3. Discussion

The main causes of death from severe drug eruption include secondary infection, hepatic and renal failure, and visceral hemorrhage. Therefore, early identification, correct diagnosis, and timely nursing intervention are critical for successful rescue. With medical advancement and continuous introduction of new drugs, drug eruption incidence is increasing with involvement of nearly all drug classes. Physicians must carefully inquire about allergy history and prescribe rationally to prevent drug misuse, particularly with known allergenic drugs, while improving high-risk population awareness to reduce mortality. Meanwhile, nurses must demonstrate high responsibility, fully recognize disease severity, accurately assess conditions, and implement proactive nursing interventions, which play a vital role in disease outcome.

The patient in this case was discharged after improvement. Before discharge, nursing staff instructed the patient to take medication regularly as prescribed and monitor closely for adverse reactions when taking previously sensitizing drugs, with immediate discontinuation and medical consultation if reactions occur. Patients should wear loose, comfortable cotton clothing to minimize skin irritation.

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**Conflict of Interest Statement:** The authors declare no conflict of interest.

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