

caused by preparations containing acrylates in dental personnel. *Clin Exp Allergy*. 1998;28:1404–1411.

7. Jaakkola MS, Leino T, Tammilehto L, Ylöstalo P, Kuosma E, Alanko K. Respiratory effects of exposure to methacrylates among dental assistants. *Allergy*. 2007; 62:648–654.
8. Sauni R, Kauppi P, Alanko K, Henriks-Eckerman ML, Tuppurainen M, Hannu T. Occupational asthma caused by sculptured nails containing methacrylates. *Am J Ind Med*. 2008;51:968–974.

TOXIC EPIDERMAL NECROLYSIS INDUCED BY LEVOFLOXACIN

Toxic epidermal necrolysis (TEN) is a severe bullous dermatitis with a mortality rate of 30% to 35%.¹ Fluoroquinolones, especially ciprofloxacin, have been implicated in cases of TEN.^{2–7} However, there is little published information on levofloxacin-induced TEN.^{4,6,7} We report a fatal case of TEN induced by levofloxacin.

A 59-year-old woman with a history of endometrial carcinoma (stage III), type 2 diabetes mellitus, and allergy to streptomycin and penicillins was admitted to the oncology department with pyelonephritis. Treatment with levofloxacin, 500 mg/d, was started. On the ninth day of treatment, the patient developed generalized purpuric exanthema. Levofloxacin use was discontinued, and the exanthema improved spontaneously. Four days later, the patient was discharged from the hospital, in good health. Forty-eight hours after discharge, the patient visited the emergency department with urinary syndrome and fever (temperature, 39°C). During the interview with the patient, a possible allergy to quinolones was not acknowledged and treatment with levofloxacin was restarted. Six hours after the administration of the first dose, the purpuric exanthema reappeared; after 24 hours, it had extended to 40% of the total body surface and became painful. Progression to desquamation and formation of conjunctival and epidermal erosions were observed in the next 24 hours. A characteristically lateral displacement of the necrotic epidermis in response to slight pressure was confirmed (Nikolsky sign) (Fig 1). The skin and mucous lesions involved the chest, back, face, neck, hands, legs, mouth, eyes, ears, and vagina. The laboratory results revealed normal red and white blood cell counts with a slightly increased erythrocyte sedimentation rate of 18 mm/h. The level of total serum proteins was 5.5 g/L; glucose, 221 mg/dL; creatinine, 1.5 mg/dL; and urea, 69 mg/dL. Levels of total bilirubin, aspartate aminotransferase, alanine aminotransferase, γ -glutamyltransferase, potassium, and sodium were within normal limits.

The patient was transferred to the intensive care unit and treated as a severe burnt patient. Protection of the skin and denuded areas and replacement of fluids and electrolytes were begun immediately. The patient also received methylprednisolone, 1 mg/kg intravenously, for 2 days, with no improvement. Laboratory test results showed abnormal liver and kidney function, hyperglycemia, hypoalbuminuria, and hypopotassemia. Her fever continued, and *Pseudomonas aeruginosa* was isolated from the blood and urine cultures. Five days later, the patient died.

TEN and Stevens-Johnson syndrome are 2 forms of the same life-threatening process.¹ Characteristically, severe mucosal erosions with widespread erythematous cutaneous maculae are the main features of the disease. The cutaneous lesions often become confluent, with a positive Nikolsky sign and epidermal detachment. TEN is defined as an epidermal detachment of more than



Figure 1. Evidence of the Nikolsky sign in a 59-year-old woman with toxic epidermal necrolysis.

30% of the skin, and it has the highest mortality rate (range, 30%–35%). Stevens-Johnson syndrome–TEN is essentially a drug-induced disease. A few cases are related to infections, such as herpes simplex and mycoplasma; also, genetic susceptibility has been suggested.

Fluoroquinolones have seldom been implicated in TEN.^{2–7} Levofloxacin is effective against a number of gram-positive and gram-negative bacteria. Because of its broad spectrum of action, levofloxacin is empirically prescribed for a wide range of infections but there is little published information on levofloxacin-induced TEN.^{4,6} To our knowledge, there is only 1 report of a fatal outcome.⁷

The risk of death in patients with TEN can be accurately predicted by the TEN-specific severity-of-illness score.⁸ According to this scale, our patient had a final score of 6 and a mortality risk higher than 90%. Patients with TEN must be quickly referred to burn or intensive care units for supportive management and nutritional support (correction of electrolyte disturbances, administration of high-caloric enteral nutrition, and prevention of sepsis).

There are no randomized controlled trials of pharmacologic agents in the treatment of this disorder. Consequently, although case reports of a variety of therapeutic approaches have emerged, more research is needed to determine the real efficacy of any new treatment. These new agents include intravenous immunoglobulin, systemic corticosteroids, tumor necrosis factor α inhibitors, cyclosporine, cyclophosphamide, plasmapheresis, and hemodialysis.⁹

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1. Borchers AT, Lee JL, Naguwa SM, Cheema GS, Gershwin ME. Stevens-Johnson syndrome and toxic epidermal necrolysis. *Autoimmun Rev*. 2008;7:598–605.

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2. Yerasi AB, Oertel MD. Ciprofloxacin-induced toxic epidermal necrolysis. *Ann Pharmacother.* 1996;30:297.
 3. Melde SL. Ofloxacin: a probable cause of toxic epidermal necrolysis. *Ann Pharmacother.* 2001;35:1388–1390.
 4. Digwood-Lettieri S, Reilly KJ, Haith LR Jr, et al. Levofloxacin-induced toxic epidermal necrolysis in an elderly patient. *Pharmacotherapy.* 2002;22:789–793.
 5. Sahin MT, Ozturkcan S, Inanir I, Filiz EE. Norfloxacin-induced toxic epidermal necrolysis. *Ann Pharmacother.* 2005;39:768–770.
 6. Christie MJ, Wong K, Ting RH, Tam PY, Sikaneta TG. Generalized seizure and toxic epidermal necrolysis following levofloxacin exposure. *Ann Pharmacother.* 2005;39:953–955.
 7. Islam AF, Rahman MD. Levofloxacin-induced fatal toxic epidermal necrolysis. *Ann Pharmacother.* 2005;39:1136–1137.
 8. Bastuji-Garin S, Fouchard N, Bertocchi M, Roujeau JC, Revuz J, Wolkenstein P. SCORTEN: a severity-of-illness score for toxic epidermal necrolysis. *J Invest Dermatol.* 2000;115:149–153.
 9. Mukasa Y, Craven N. Management of toxic epidermal necrolysis and related syndromes. *Postgrad Med J.* 2008;84:60–65.
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