

Urine induced contact irritant dermatitis during periods of weaning from diapers and in enuretic toddlers and children

The most common dermatologic disorder of infancy is diaper dermatitis. It is a non-allergic dermatitis which is primarily non-infectious. It is mainly based on impairment of the barrier function of the skin. The etiology is multifactorial, the most important being: water and moisture; friction; urine; feces and microorganisms.¹

A moist environment and the effects it creates, such as maceration is the most important factor in the development of diaper dermatitis. Moisture makes the skin more fragile, increasing its susceptibility to frictional damage and destabilizes the barrier function of the skin with resultant increase in irritant chemical penetration and pathogen replication.² The presence of diaper dermatitis on convex surfaces in areas covered by diapers (buttocks, genitals, abdomen below the umbilicus, thigh above the knee) confirms the role of friction in diaper dermatitis. The erosive effect of fecal enzymes (urease, protease and lipase) also lessens epidermal integrity. Urine can also increase the permeability of the skin to irritants and can directly irritate skin when exposure is prolonged.³ The primary irritant is increase of pH and not ammonia.⁴ Increase in wetness and pH are both significantly associated with elevated mean grades for diaper dermatitis.⁵

Incontinence-associated dermatitis (IAD) is similar to diaper dermatitis and occurs when urine (or stool) come into contact with perineal or perigenital skin. It usually afflicts the very young and the very old populations. Prevention and treatment for IAD are very similar to those recommended for diaper dermatitis.⁶

Babies and toddlers who are being weaned from diapers and children with nocturnal enuresis maybe exposed to urine for long periods of time especially if nocturnal enuresis occurs during the early hours of the night. An association between sleep disorder and enuresis has been found with a diminished capacity to be aroused from sleep as a primary feature. Prolonged exposure to urine is a known risk factor for skin irritation.

¹ Atherton DJ. The etiology and management of irritant diaper dermatitis. *J Eur Acad Dermatol Venereol* 2001; 15 Suppl; 1:1-4.

² Zimmerer RE, Lawson KD and Calvert CJ. The effects of wearing diapers on skin. *Pediatr Dermatol* 1986; 3:95-101.

³ Berg RW, Buckingham KW and Stewart RL. Etiologic factors in diaper dermatitis: the role of urine. *Pediatr Dermatol* 1986; 3:102-106.

⁴ Donaldson RM. Normal bacterial populations of the intestine and their relation to intestinal function. *N Engl J Med* 1964; 270:938-945.

⁵ Berg RW, Milligan MC and Sarbaugh FC. Association of skin wetness and pH with diaper dermatitis. *Pediatr Dermatol* 1994; 11:18-20.

⁶ Gray M, Bliss DZ, Doughty DB et al. Incontinence-associated dermatitis: a consensus. *J Wound Ostomy Continence Nurs.* 2007; 34:45-54.