The Effect of Different Incontinence Briefs on Skin Barrier Function in Institutionalized Adults

Catherine T. Milne APRN, MSN, BC-ANP, CWOCN
Darlene Saucier APRN, MSN, BC-FNP, CWCN
Connecticut Clinical Nursing Associates, LLC
PO Box 1535 • Bristol, Connecticut 06011-1535
860-340-8280

Abstract

Introduction: Urinary and fecal incontinence effects on skin barrier function are well known.[1,2] Increased transepidermal water loss rates are indicative of water loss and poor skin barrier function. Unfortunately, increased transepidermal water loss is not clinically evident to an examiner's eye.[3]

Method: 25 elderly institutionalized subjects underwent repeated transepidermal water loss readings using their usual* incontinence management product using an evaporimeter**. Subjects were then standardized to a superabsorbent gelling incontinence brief***. After one week, subjects underwent repeated transepidermal water loss measurements. The patients returned to usual* incontinence management again repeating transepidermal water loss readings after one week. Clinical observations of skin health were also recorded.

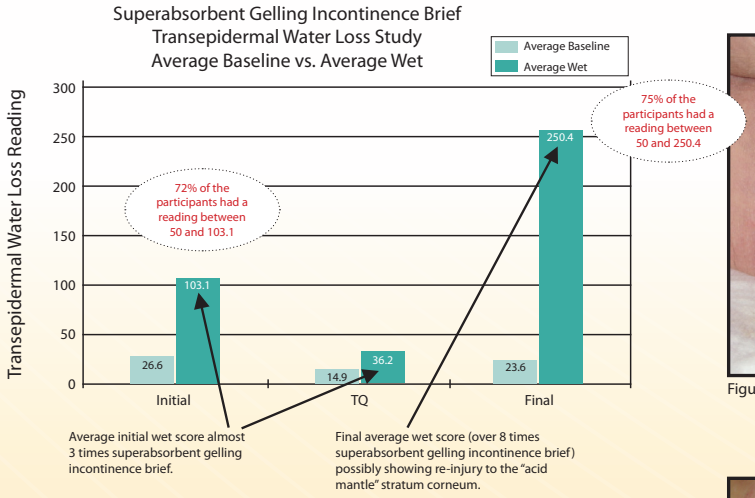
	Average Base line Transepidermal Water Loss (gm/ m2)	Average Incontinent Transepidermal Water Loss rate (gm/m2)	% increase in Transepidermal Water Loss rates
Usual incontinence brief	26.6	103.1	295%
Superabsorbent gelling incontinence brief	14.9	36.2	157%
Return to usual incontinence brief	23.6	250.4	1103%

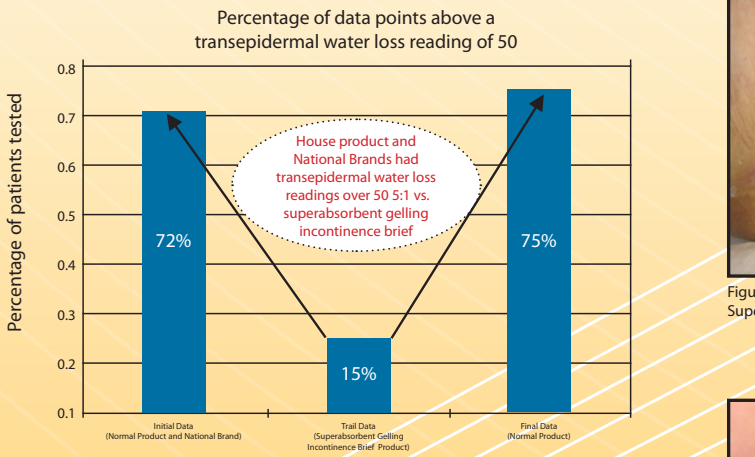
Results: Mean baseline transepidermal water loss readings prior to the superabsorbent gelling incontinence brief were 26.6 gm/m² increasing to 103.1 gm/m² at incontinent episodes. Superabsorbent gelling incontinence brief mean baseline transepidermal water loss readings decreased to 14.9 gm/m² with mean readings of 36.2 gm/m² at incontinent episodes. Returning to the usual* incontinence management, baseline transepidermal water loss increased to a mean of 23.6 gm/m² with transepidermal water loss rates of 250.4 gm/m² with elderly institutionalized subjects. There is statistical significance at $p < 0.05$ using a Student's t test. No visible skin alterations were noted.

*Cloth reusable, Industry-Average Moderate Absorbency Brief
**Vapometer (Delfin Instruments, Finland).
***Tranquility SlimLine Disposable Brief (Principle Business Enterprises, Ohio)

1. Grey M, Bliss D, Doughty D, Ermer-Seltun J, Kennedy-Evens K, Palmer M, Incontinence-associated Dermatitis. J WOCN. January/February 2007; 34 (1): 45-54.
2. Doughty D. Urinary and Fecal Incontinence: Current management concepts. 3rd Ed. St Louis, Elsevier; 2006.
3. Voegeli R, Rawlings AV, Doppler S, Schreier T. Increased basal transepidermal water loss leads to elevation of some but not all stratum corneum serine proteases. Int J Cosmet Sci. Dec 2008; 30(6): 435-442.

Costs associated with poster presentation and an unrestricted research grant were given to Ms. Milne and Ms. Saucier by Principle Business Enterprises.





Conclusion: This study suggests that the method of diaper construction can profoundly impact skin barrier function in the elderly institutionalized subjects, supporting Akin's (1997) work. Loss of skin barrier function can be demonstrated via increased transepidermal water loss yet not clinically observed after changing incontinence products, leading to a false sense of security by clinical staff who routinely use observation to make clinical decisions regarding the effects of incontinence containment products on skin health.

Figure 3 – Baseline Psoriasis Subject

Figure 4 – One Week after Change to Superabsorbent Gelling Incontinence Brief Product

Figure 5 – Two weeks after change to Superabsorbent Gelling Incontinence Brief Product