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A critical review of the inter-relationship between skin vulnerability and urinary incontinence and related nursing intervention

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Abstract

The literature reveals there has been limited critical discussion of the inter-relationship between urinary incontinence, the vulnerability of the skin and the clinical implications. This paper critically re-examines the literature to identify and apply relevant scientific principles and evidence to inform effective intervention. It includes background on the structure, function and disruption to the skin's barrier. The implications for fundamental and largely taken-for-granted nursing practices, such as washing the skin, are examined. The current state of knowledge is analysed, specifying the types of evidence available and its weaknesses, highlighting implications for a research agenda.

Keywords: Skin; Incontinence; Skin barrier function; Skin care; Emollients

1. Introduction

The focus of this paper is an analysis of the vulnerability of the skin barrier from urinary incontinence and the scope for nursing intervention to help promote or restore an effective skin barrier. It examines the scale and significance of the problem, the nature of the skin barrier and the skin's vulnerability to urine exposure and its consequences. Finally, the principles and evidence underpinning nursing intervention to protect and maintain a healthy skin barrier are examined and critical gaps in current evidence are identified.

A literature search took place using electronic databases: Medline, CINAHL and the Cochrane Library, up to January 2004. The following search terms were used: skin, skin care, skin barrier, incontinence, continence, urine, washing, soap, cleansers, emollients and combinations of these terms. Citations were followed up in reference lists for key citations. Key current texts were hand searched and relevant previously unidentified sources were followed-up to capture literature not published in academic journals. Given the lack of data, especially from experimental studies, a meta-analysis was not possible. Evidence was categorised and tabulated by type (Table 1) ranging from clinical observations to studies of different research design to ensure the nature of the source material is explicit. The quality of evidence remains a key issue (Grade Working Group, 2004); this is partly reflected in the evidence source categories just described (based on Hamer and

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Table 1
Prevalence of urinary incontinence (DOH, 2000)

For people living at home
Between 1 in 20 and 1 in 14 women aged 15–44
Between 1 in 13 and 1 in 7 women aged 45–64
Between 1 in 10 and 1 in 5 women aged 65 and over
Over 1 in 33 men aged 15–64
Between 1 in 14 and 1 in 10 men aged 65 and over
For people (both sexes) living in institutions
1 in 3 in residential homes
Nearly 2 in every 3 in nursing homes
1 in 2 to 2 in 3 in wards for elderly and elderly mentally infirm

Collinson, 1999). For the few experimental studies identified, some appraisal criteria have been used based on the Cochrane Collaboration (2004) handbook. The review focused on adult related problems; therefore, literature on child-related diaper dermatitis was excluded, although perineal dermatitis is examined.

2. Scale and significance of problem

The scale of the problem of skin barrier disruption as a result of urine exposure has not been adequately studied. However, an indication of the potential significance of the problem can be derived from gauging the prevalence of urinary incontinence (Getliffe and Dolman, 2003).

Worldwide there are over 200 million people who have significant urinary incontinence and many more with mild bladder problems (Abrams et al., 2002). Table 2 provides a summary of UK prevalence data (Department of Health (DOH), 2000), which indicates the very high occurrence of incontinence in people living in institutional settings. The results of a recent survey of over 10,000 adults aged over 40, which included a high response rate of over 70%, showed that more than one in three had clinically significant symptoms of bladder problems (Perry et al., 2000). More than 20% of women and nearly 15% of men had incontinence several times a month although the majority did not want help. Obesity has now been recognised as a risk factor for incontinence in women, with a 4.2 times associated risk for stress incontinence and a 2.2 times associated risk with urge incontinence (Abrams et al., 2002). Given that obesity now affects 20% of the population in this country, and can also present other risks of skin vulnerability due to formation of skin folds, this factor needs greater attention (National Audit Office, 2001). It has been estimated that around 500,000 children in the UK suffer from nocturnal enuresis (persistent bedwetting) (DOH, 2000), and these represent another group at high risk of urine-damaged skin. The persistence of nocturnal enuresis into adulthood is frequently unacknowledged but one in 100 adults continue to have lifelong bedwetting problems (ERIC, 1995). Although incontinence is certainly not an inevitable accompaniment of older age, an increased incidence of multiple disabilities in older people can contribute to reduced ability to maintain continence, making this group vulnerable to skin damage linked to urine exposure.

Although the focus here is on urinary incontinence, faecal incontinence may present even more risk to skin integrity (Allman, 1986; Shannon and Skorga, 1989). Its prevalence is more difficult to estimate because it is seen by professionals and the public to be more embarrassing, resulting in reluctance by the former to ask questions and the latter to seek help (Johanson and Lafferty, 1996). However, it is more common in the general population than is often realised and the postal survey cited above, it has been found that 5.7% of women and 6.2% of men over 40 years living in their own homes report some degree of faecal incontinence (Perry et al., 2002). Overall 1.4% of adults reported major faecal incontinence (at least several times a month) and 0.7% had disabling incontinence with a major impact on their quality of life. As with urinary incontinence there is a higher risk of faecal incontinence and double incontinence in institionalised individuals.

3. The skin barrier

The skin may be regarded as the largest organ of the body, and as such performs a number of key functions essential for maintaining homeostasis. These range from physical protection of the body, communication with the external environment, through to thermoregulation. Perhaps, the most important of these is the barrier function, with the prevention of the entry of pathogens being generally regarded as the prime role. Detailed study of skin function suggests that the prevention of water loss is of critical importance in barrier function (Forslind, 1995).

Structurally, the skin consists of two principal layers, the epidermis and the dermis. The epidermis is the upper, thinner layer of the two, and is responsible for providing the barrier function. Histologically, it is composed of stratified squamous epithelium, organised in four or five layers, depending on its anatomical position. The outer stratum corneum is an important protective layer, consisting of 25–30 rows of flattened, dead cells called corneocytes filled with the protein keratin. Corneocytes are continuously shed and then replaced by the upward movement of the cells through the layers of the epidermis. It is this layer that provides