Clinician perspectives on medical adhesive-related skin injuries

KEY WORDS
- Medical adhesive-related skin injury
- Fragile skin
- Prevention and education

Medical adhesive-related skin injury (MARSI) is a prevalent, under-recognised and preventable complication that occurs across all care settings, age groups and patient types. Use of medical adhesives may affect skin integrity, cause pain, increase risk of infection, potentially increase wound size and delay healing, all of which reduce patient quality of life unnecessarily. In addition, MARSI is costly in terms of nursing time and costs. A new survey of UK wound care clinicians sought to understand clinician experiences of and perspectives on MARSI and found that incidence of MARSI is high, yet education around assessment of risk and prevention are low. The results of the survey show that clinicians both need and want improved educational efforts around MARSI awareness, identification of patients at risk of MARSI and strategies for preventing MARSI. Broadly, more research on the exact pathophysiology of MARSI is needed, in order to deepen understanding and aid the development of formal MARSI education programmes.

KAREN OUSEY
Professor and Director for the Institute of Skin Integrity and Infection Prevention, School of Human and Health Sciences, University of Huddersfield, Queensgate, Yorkshire

STEPHANIE WASEK
Independent medical writer, London, UK

Medical adhesive-related skin injury (MARSI) is a prevalent, under-recognised and preventable complication that occurs across all care settings, age groups and patient types, from healthy patients in ambulatory care, to patients with multiple comorbidities in critical care (McNichol et al, 2013). MARSI has been defined as "an occurrence in which erythema and/or other manifestation of cutaneous abnorma (including, but not limited to, vesicle, bulla, erosion, or tear) persists 30 minutes or more after removal of the adhesive" (McNichol et al, 2013).

When superficial layers of skin are removed by medical adhesive, the process may affect skin integrity, cause pain, increase risk of infection, potentially increase wound size and delay healing, all of which reduce patient quality of life unnecessarily (Cutting, 2008). In some cases, adhesives can also cause deeper tissue injuries beyond the loss of superficial skin layers (Denyer, 2011). Although the injuries caused by medical adhesives may look minor, care and management of MARSI has a deleterious effect on nursing resources. One recent survey that specifically explored injuries caused by medical tapes found that nurses treated these injuries approximately five times a week, an average of 7.8 times per patient, at a cost of approximately €1.23 (~£1.11) per treatment application — or ~€8.86 (~£7.99) per patient through to healing (Maene, 2013).

GAPS IN UNDERSTANDING OF MARSI PREVALENCE

There is evidence to show a high incidence of adhesive-related skin injuries. For example, these injuries have been reported as the most common source of skin breakdown in neonatal intensive care units (KullerMcManus, 2001). Furthermore, incidence in the nursing home setting has been recorded as 15.5% (Konya et al, 2010). One survey identified that 98.6% of registered nurses working in the nursing home setting said skin tears were common to "extremely common" among their patients (White, 2001). A more recent survey of

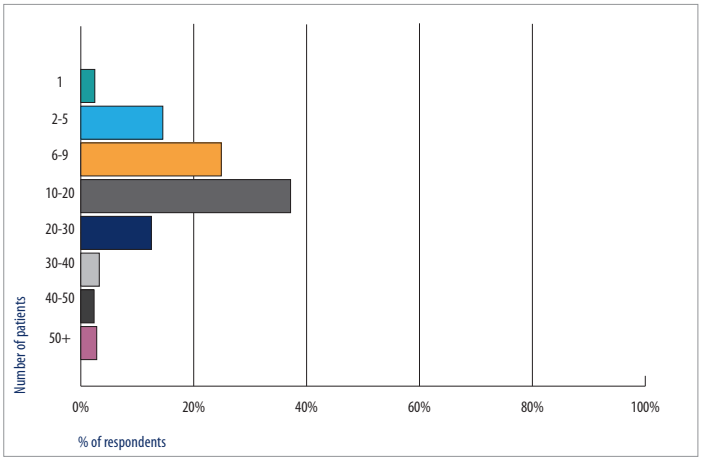

Figure 1a.On average, how many patients do you care for on a daily basis?

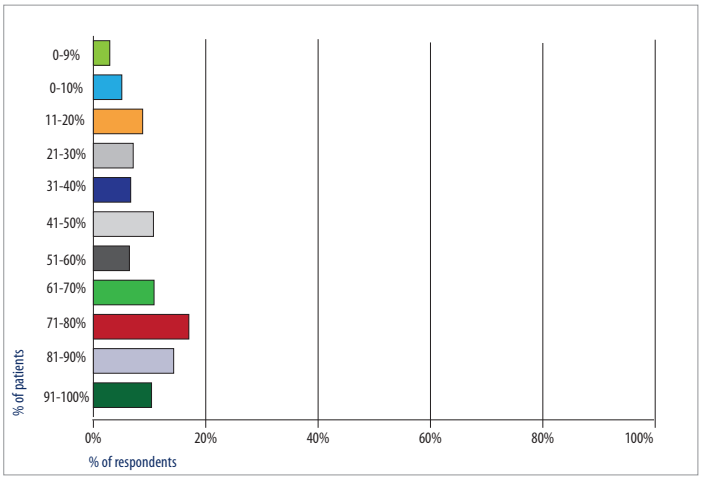

Figure 1b. What percentage of patients you see have fragile skin?

Box 1. Skin tears and MARSI

It should be noted that although MARSI can be classed as — and is a feature of — a skin tear, there are subtle difference between them.

Skin tears: Traumatic injuries that can result in partial or full separation of the outer layers of the skin. These tears may occur due to shearing and friction forces or a blunt trauma, causing the epidermis to separate from the dermis (partial-thickness wound), or both the epidermis and the dermis to separate from the underlying structures (full-thickness wound) (LeBlanc and Baranoski, 2011).

MARSI: An occurrence in which erythema and/or other manifestation of cutaneous abnormality (including, but not limited to, vesicle, bulla, erosion, or tear) persists 30 minutes or more after removal of the adhesive (McNichol et al, 2013).

hospital-based nurses found that nearly all (n=41) respondents had treated skin injury due to adhesive use in the 12 months leading up to the survey, with a MARSI incidence rate of 7.1% and an average of 2.8 injuries per patient who suffered skin damage (Maene, 2013).

Although there is a body of knowledge surrounding skin tears, these injuries can be caused by factors other than MARSI (LeBlanc and Baranoski, 2011) (*Box 1*). Furthermore, much of the existing research on skin injuries in general has focused on the use of medical tapes, and does not account for the more recent, broader definition of MARSI, which factors in appropriateness of tape selection, appropriateness of dressing selection, adequacy of skin preparation and whether adhesive removal was carried out correctly.

The lack of specific and well-defined research into MARSI perhaps attests to a gap in the knowledge of wound care professionals, as well as under-reporting across settings. To deepen understanding around the prevalence and issues surrounding the full breadth of MARSI, a survey was commissioned.

METHODOLOGY

In August and September 2016, a web-based survey was distributed to UK-based wound care clinicians via SurveyMonkey by Wounds UK (Wounds UK, 2016). Overall, 918 clinicians responded to the survey. Specialities included wound care (37%), GPs (11%) and geriatric clinicians (8%). Nearly one-third (296 respondents) classed their specialism as 'other', which included podiatrists (n=61), community nurses (n=71) and district nurses (n=19) as well as vascular, care of the elderly and neonatal clinicians. The split of settings (n=907) respondents work in was 35.4% in the hospital, 28% in community nursing, 7.8% in nursing homes and 12.9% in GP practice. Other settings (15.9%) responses included hospice, clinic and those who worked in a mix of setting types. The survey sought to understand the incidence and causes of MARSI, as well as levels of awareness and education regarding MARSI and its prevention. Statistical analysis was carried out by an independent medical writer after completion of the survey.

RESULTS

In order to establish the extent of potential for MARSI, the survey explored weekly patient caseloads and the percentage of these patients seen who present with fragile skin. The most frequently given response for number of patients seen each week was 10–20 (35.9% of respondents), with 60.6% of these respondents saying that more than half their patients have fragile skin. Overall, more than half of respondents reported that at least 60% of the patients they see have fragile skin (Figures 1a and 1b). The majority of participants recognise that a wide variety of injury types and skin damage can occur as a result of medical adhesives; only folliculitis (inflammation of the hair follicles) lagged in terms of awareness (*Figure 2*).

Frequency and aetiology of MARSI

This discrepancy in awareness may be explained by the infrequency with which folliculitis occurs — it is much more rare than other types of MARSI (*Figure 3*). The results show that there is strong understanding of the causes of skin stripping, tension injury and maceration in particular (*Figure 4*). Although most research into skin injury has focused on medical tape, two of the top three clinical applications associated with MARSI were non-surgical wound care dressings (67%) and surgical wound care dressings (43%) (*Figure 5*).

Clinician knowledge of MARSI

Despite these results, 70.5% of respondents reported that MARSI are not recorded in their facility. And just 31.3% of respondents have heard of MARSI as a collective way to describe forms of skin damage caused by medical adhesives. Although only 37% of respondents expressed concern about the incidence MARSI in their area of work, 72% report that the prevention and management of MARSI should be an integral part of skin and wound care training (based on a score of 8, 9 or 10 out of 10). Encouragingly, 78% of respondents said they have used a barrier film to protect the skin before applying medical adhesives, and 11.7% reported that they use barrier film

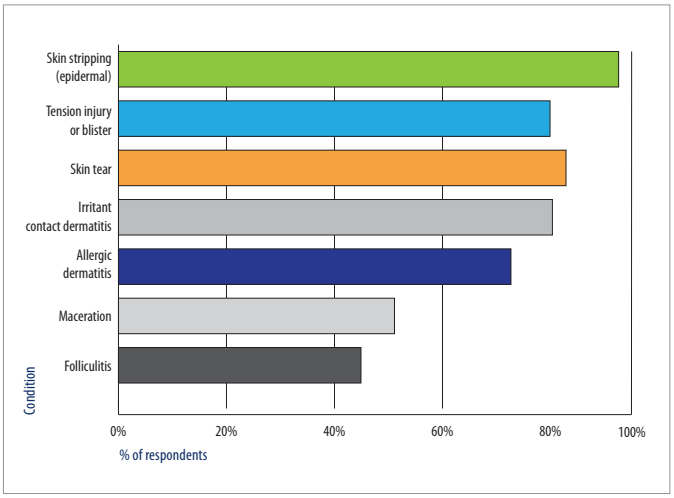

Figure 2. Which of the following do you recognise can occur as a result of medical adhesive-related skin injury (MARSI)? Tick all that apply

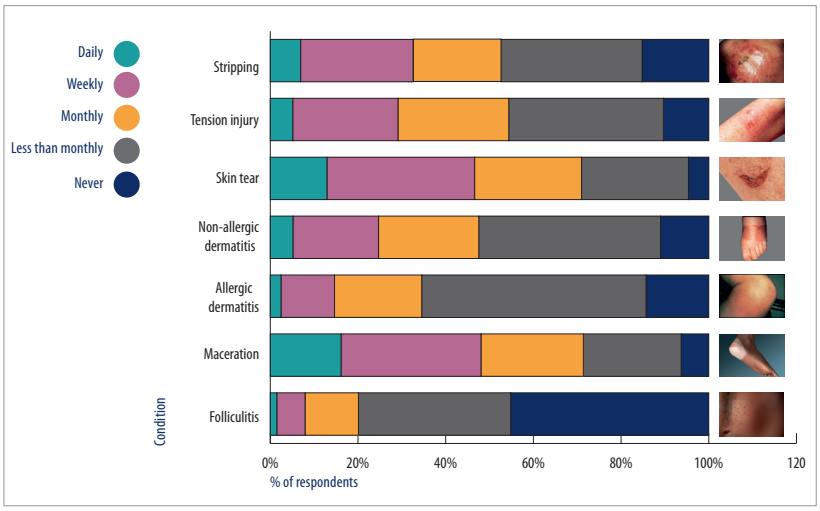

Figure 3. How often do you come across the following types of skin injury?

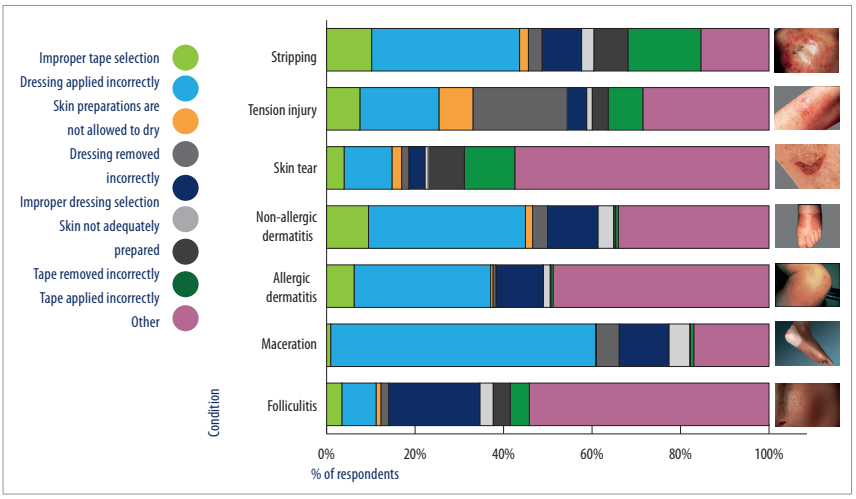

Figure 4. What do you believe causes the types of skin injury that you come across?

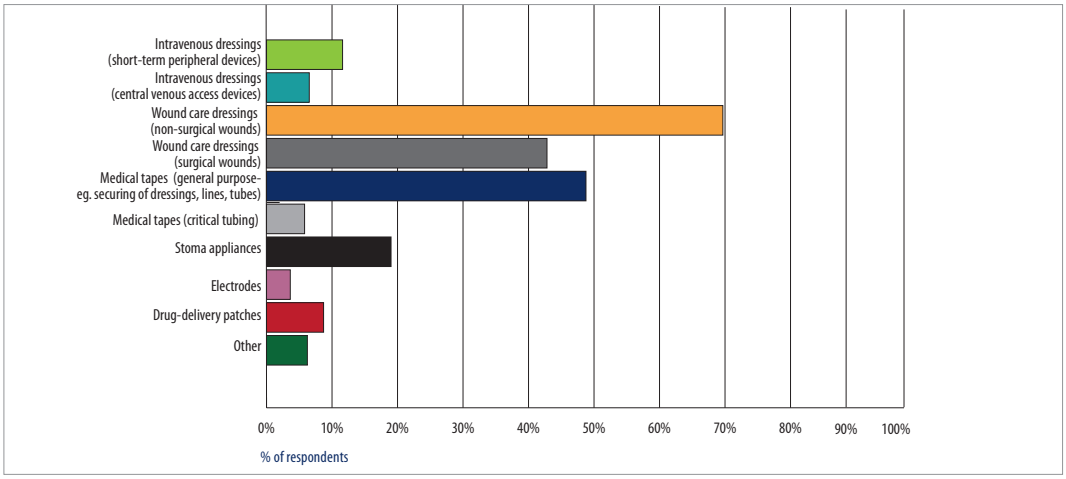

Figure 5. In what clinical applications do you see most incidence of medical adhesive-related skin injury (MARSI)? Please tick up to 3 responses.

routinely on all patients (91–100%) — indicating that there is a level of familiarity with and understanding of the types of steps that can be taken to prevent MARSI.

DISCUSSION

Perhaps due to the frequency with which MARSI occurs, there is a low level of clinician concern. However, this may be better explained by correspondingly low levels of MARSI-related education: Over 80% of respondents described the level of training in the area of prevention and treatment of MARSI as either inadequate or unavailable. Furthermore, an overwhelming 97% of respondents said they would recommend that the prevention of MARSI and the identification of patients at risk of MARSI should be integral components of skin assessment.

The results of the survey demonstrate there is a clear and present need for improvement of educational efforts around MARSI awareness, identification of patients at risk of MARSI and strategies for preventing MARSI. Not only does the need exist, but wound care clinicians desire more MARSI-related education. Current research in the field of MARSI has shown that there are several causal factors: composition of the adhesive, length of time the adhesive is left in place, intrinsic patient factors (e.g. very young or very old age, underlying medical conditions), condition and environment of the skin, and extrinsic and/or treatment factors (e.g. certain medications, repeated use of adhesives over a prolonged period) (McNichol et al, 2013; Zeng et al, 2016). More research is needed to pinpoint the precise pathophysiology of MARSI, and more efforts are needed to develop formal MARSI education and prevention programmes (McNichol et al, 2013). WUK

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