INTRODUCTION

Pressure ulcer
A pressure ulcer is a localized injury of the skin and/or underlying tissue resulting from an internal response to an external mechanical load, applied to soft biological tissues, generally over a bony prominence.

Incontinence- Associated Dermatitis (IAD)
IAD is a reactive response of the skin to chronic exposure to urine and faeces which can be observed as an inflammation and erythema with or without erosion or denudation. Patients with IAD are susceptible to secondary skin infections, candidiasis being one of the most common secondary infections associated with IAD.
Complexity of skin assessment in sacral area

How many patients are affected by IAD?

- Prevalence (i.e., proportion of patients with IAD at a defined point in time): 5.6%-50%
- Incidence (i.e., proportion of patients who develop IAD over time): 3.4%-25%

IAD: BEST PRACTICES IN A GLOBAL PERSPECTIVE - PROF. D. BEECKMAN, 2015
CONFUSION IN PRACTICE

Survey (n= 1911)

- 90.4% observed IAD in daily practice
- IAD is not a pressure ulcer (73.5%)
- ... but should be prevented as a pressure ulcer (61.5%)

IAD AND SKIN BARRIER FUNCTION

- Incontinence: water is pulled into and held in the corneocytes
- Overhydration: swelling and disruption of the structure of the stratum corneum, and leads to visible changes in the skin
- Excessive hydration: irritants may more easily penetrate the stratum corneum to exacerbate inflammation
- Overhydrated skin: epidermis more prone to injury from friction
IAD AND SKIN BARRIER FUNCTION

- Exposure to urine and/or faeces: skin becomes more **alkaline** (skin bacteria convert the substance urea to ammonia which is alkaline)
- Increase in **skin pH**: micro-organisms to thrive and increase the risk of skin infection
- **Faeces** contain lipolytic (lipid-digesting) and proteolytic (protein-digesting) enzymes capable of damaging the stratum corneum

DOES IAD CONTRIBUTE TO PRESSURE ULCER DEVELOPMENT?

- Incontinence = well-recognized risk factor for the development of pressure ulcers
- Until recently, the relationship between IAD and pressure ulcers had not been explored
- IAD and pressure ulcers have a number of risk factors in common
- Once IAD occurs, there is a high risk for pressure ulcer development as well as an increased risk of infection and morbidity
DOES IAD CONTRIBUTE TO PRESSURE ULCER DEVELOPMENT?

Superficial pressure ulcers

- Superficial skin changes are **predominantly caused by frictional forces on the skin surface**
- The literature further identifies changes in **skin microclimate conditions** (due to trapped perspiration or urine and/or faeces at the skin-surface interface), which may **increase the risk for superficial pressure ulceration**

Deep pressure ulcers

- Wet skin demonstrates a higher coefficient of friction (CoF)
- Computational modelling: the increase in skin-support CoF simultaneously reduces tissue tolerance to pressure and shear stresses within deeper tissues (which ultimately causes a pressure ulcer to form)
WHAT THE EVIDENCE TELLS US ...

The aim of this systematic review and meta-analysis was to identify the associations between IAD, moisture and incontinence as its most important etiologic factors, and pressure ulcer development. The following research questions were addressed:

1. What is the association between IAD and pressure ulcer development?
2. What is the association between incontinence and pressure ulcer development?
3. What is the association between moisture and pressure ulcer development?
WHAT THE EVIDENCE TELLS US ...

Data sources

- Five databases (Medline, Embase, CINAHL, Web of Science, and the Cochrane Library)
- Conference proceedings
- End of study inclusion: March 15, 2013

Study Selection

- Original studies with a quantitative design
- Persons aged 18 years and older
- Reporting an association between incontinence-associated dermatitis, incontinence or moisture, and the development of PUs.

WHAT THE EVIDENCE TELLS US ...

Results

- Fifty-eight studies were included
- Measures of relative effect at the univariate level were meta-analyzed
- In most studies (86%), a significant association between variables of interest was found, with pooled odds ratios in univariate models varied between 1.92 (95% CI 1.54-2.38) for urinary incontinence and 4.99 (95% CI 2.62-9.50) for double incontinence (p<0.05)
WHAT THE EVIDENCE TELLS US ...

Conclusion

- Despite the methodological variation in available studies and the heterogeneity of their results, our analysis indicates a likely association between IAD, its most important etiological factors, and the development of pressure ulcers.
- Well-designed cohort studies are needed to determine a causal relationship between the variables.

PREVENTION

- Prevention of IAD must include a consistent and well-defined skin care regimen, including:
  - Gentle perineal cleansing
  - Moisturization
  - The application of a skin protectant or moisture barrier
- The use of absorptive or containment products and/or indwelling devices, might be needed in specific situations to support prevention of IAD.
The use of absorptive or containment products and/or indwelling devices, might be needed in specific situations to support prevention of IAD.
**PREVENTION**

- Gentle perineal cleansing
  - Should involve a product whose pH range reflects the acid mantle of healthy skin (pH between 5.4-5.9)
  - The pH of normal soap is alkaline and in the range of 9.5-11.0
  - Increase of stratum corneum swelling
  - Alteration in lipid rigidity
  - Many no-rinse skin cleansers are “pH balanced” in order to ensure that their pH is closer to that of healthy skin.
PREVENTION

- Gentle perineal cleansing
  - Minimize friction damage
  - Drying the skin by patting with a towel offered no advantage to conventional gentle rubbing as it leaves the skin significantly wetter and at greater risk of frictional damage
  - As soon as possible to limit contact with urine and stool
  - Fecal incontinence!
Moisturization / skin conditioning
- Barrier function = intercellular lipids + intact keratinocytes
- Loss of water at the stratum corneum (TEWL)
- Moisturization / skin conditioning involves repairing the skin barrier
- Moisturizers contain varying combinations of emollients, occlusives, and humectants
- The routine use of moisturizers is useful in replacing intercellular lipids and maintaining the barrier function of the skin

Skin protecting
- To primarily prevent skin breakdown due to moisture and biological irritants in urine and faeces
- A wide variety of products and formulas with both moisturizing and/or protecting/barrier capability.
- Must allow skin observation!
PREVENTION

○ Skin protecting
  ○ Commercially available skin protectants vary in their ability to protect the skin from irritants, prevent maceration, and maintain skin health:
    • Petrolatum: protection against irritants and maceration and provided some skin hydration
    • Dimethicone: varied in protection against irritants and have skin hydration potential and good barrier efficacy
    • Zinc oxide-based products: Good protection against irritants but poor skin hydration to prevent maceration
    • Acrylate terpolymer based products: Protection against irritants, indirect skin hydration

TREATMENT

○ Treatment of IAD must include a consistent and well defined skin care regimen, including:
  ▪ Gentle perineal cleansing
  ▪ Moisturization
  ▪ The application of a skin protectant or moisture barrier

○ The use of absorptive or containment products and/or indwelling devices, might be needed in specific situations to support treatment of IAD
TREATMENT

- The addition of antifungal products, steroidal based topical anti-inflammatory products, and topical antibiotics to treat IAD is only recommended in specific situations.
- Referral to a continence specialist if needed!
- Patients who do not respond to treatment within two weeks should be referred for additional evaluation

SUMMARY

Incontinence Management
- Ureum/ammonium
  - pH
  - Bacterial load
- Enzym. activity
  - pH
  - Bacterial load
- Enzym. activity
  - Ureum/ammonium
  - pH
  - Bacterial load

Moisturizing
Protecting
- Gentle perineal cleansing
- Physical irritation

Cutaneous infections
- Bacterial growth

Weakened skin + Friction
- HEALTHY SKIN
CONCLUSION

- Incontinence = risk factor for pressure ulcers, but IAD can occur in the absence of any other pressure ulcer-associated risk factors and vice versa.
- The presence of any urinary and/or faecal incontinence, even in the absence of other risk factors, should trigger implementation of an appropriate IAD prevention protocol.
- Skin care should be an essential element in each pressure ulcer prevention protocol.

INCONTINENCE-ASSOCIATED DERMATITIS, INCONTINENCE, AND MOISTURE AS RISK FACTORS FOR PRESSURE ULCER DEVELOPMENT: EVIDENCE AND BEST PRACTICES IN A GLOBAL PERSPECTIVE

Dimitri.Beeckman@UGent.be