Aging Changes that Increase the Risk of Wounds and Decrease Wound Healing

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DISCLOSURE

• None
Goals

1. Understand changes in aging skin
2. Understand comorbidities that can lead to chronic wound
3. Recognize palliative wound
Mrs. H is an 81 year old female admitted to your nursing home with contractures, tube feeding, and multiple PrU of the buttocks and lower extremities. She had history of dementia x 8 years and has been hospitalized multiple times for medical issues that included UTI, pneumonia, GT replacement, and anemia with gastrointestinal bleed. She’s had a PEG tube now for 1.5 years. This is her third nursing home admission. The daughter who is HCP insists that everything be done to keep her alive. They take detailed notes of all conversations and care rendered, and frequently document their mother’s wounds with their cell phone camera.
Changes in Aging Skin

- Thinning of the epidermis
- Flattening of the dermal-epidermal junction
- Disorganization of collagen and elastin

Adapted from Nagwa et al, Ind J Derm 2012: 57 (3); 181-186
Changes in Aging Skin
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Intrinsic vs Extrinsic factors
Intrinsic Changes in Aging Skin

• Increased Reactive O2 Species (ROS), decreased antioxidative capacity
• Increased matrix metalloproteases (MMPs)
• Decreased Langerhans Cells, aberrant function of T, B Cells [immunosenescence]
• Flattening of the dermal-epidermal junction (rete ridges)
• Dermis: reduced fibroblasts, macrophages and mast cells
• Reduced vascularity and elastin
• Loss of Extracellular Matrix (ECM) components: collagen and glycosaminoglycans

Intrinsic Changes in Aging Skin

- Diminished sensation to light touch and pressure (Meissner & Pacini corpuscles)
- Reduced sebum secretion
- Decreased ability to produce Vitamin D3
- Decreased pilosebacious units, sweat glands and subcutaneous fat
- Advanced glycation end products (AGE’s) and increased fibroblast death (apoptosis)

Extrinsic Changes in Aging Skin

- Environmental insults through oxidative stress
- Generation of free radicals and reactive oxygen species (ROS)
- ROS stimulates the lipid peroxidation reaction cascade and the release of pro-inflammatory mediators
- Most important: UV radiation, Cigarette Smoke, Ozone(03), Airborne particulate matter

Extrinsic Changes in Aging Skin

- Cigarette Smoke (CS) has over 4,000 chemicals including pro-oxidants, free radicals, and nitric oxide
- Directly induces oxidative stress and other adverse chemical reactions
- Ozone (O3) is a gaseous oxidant that also directly induces oxidative stress, decreases antioxidants such as Vitamin C, E, and Glutathione (GSH)
- Polycyclic aromatic hydrocarbons (PAHs) adsorbed to airborne particulate matter (PM) may activate xenobiotic metabolism and induce ROS and MMPs

Co-Morbidities that Impact Skin

- Altered nutritional status
- Altered hormone levels (Estrogen, Testosterone, GH)
- Anemia
- Atherosclerosis, decreased perfusion
- Venous insufficiency
- Diabetes with microvascular and neurologic changes
- Any source of edema: CHF, Venous stasis, and hypoalbuminemia

Co-Morbidities that Impact Skin

- Any source of hypoxia: COPD, OSA, etc.
- Low output state: CHF, shock
- Incontinence with Moisture Associated Skin Damage (MASD)
- Colonization of skin with fungus and pathogenic, multiple resistant bacteria
- Pharmacologic compromise: corticosteroids, immunomodulators
- Obesity, lymphedema

Cumulative Results of Co-morbidities and Age

- Xerosis (dry skin), pruritis
- Decreased reserve: Homeostenosis, affects thermoregulation and H2O balance
- More susceptible to injury including shear forces, ischemia, pressure related trauma, maceration
- More susceptible to infection
- Prolonged wound healing

Management of Wound in Older Adults

• Clinical assessment of “at risk” status
• Offloading: repositioning and surfaces
• Maintain awareness of devices, lines
• HOB elevation: consideration of priorities (i.e. ventilators and TFs require >30 degrees but PU prevention requires <30 degrees)
• Document your wounds and interventions!
• Consider palliative care principles
Pressure Ulcer before Death in Advanced Dementia

Figure 3. Proportion of Nursing Home Residents Who Had Distressing Symptoms at Various Intervals before Death.

How Dementia Impacts Wound Care

• Incontinence with chronic MASD and fecal contamination
• Severe immobility:
  • Need for advanced support surfaces
  • Difficulty with transportation, need for skilled home nursing
• Nutritional Risk:
  • Dysphagia, depression, inability to feed self
  • Tube feeding
• Infectious aspects of institutional environments:
  • C Diff, Multi-resistant organisms
  • Isolation procedures
• Perception and expression of pain
• Ethical aspects of care:
  • Informed consent for procedures
  • Health Care Proxy, AD’s

Mengell, C. Improving practice in wound care for patients with dementia.. Nurs Times. 2004 Sep 21-27;100(38):29
Skin and Dying Process

• Skin changes at EOL
  • Reduce tissue perfusion
  • Decrease tolerance to external insult
  • Impaired removal of metabolic waste

• Communication among members of team and patient’s circle of care
  • Expectation of EOL goals
  • Discussion of SCALE

Recognizing Palliative Wound

- When there is little/no realistic chance of healing
- Wound is unresponsive to therapy
- The process of achieving healing is inconsistent with overall goals of care
- The dying process
The Palliative Approach to Wound Care

- Identify the goals of care: cure vs comfort
- Consider AD’s, values, and ethical issues
- Educate the patient and family
- Emotional support and promote comfort
- Prevent further skin deterioration and infection
- Optimize pain management and other symptoms
- Engage the entire care team, including physician and family
- Reconsider futile, heroic, measures: Repeated hospital transfers/ Sharp debridements/ Operative procedures/ Skin grafts
- Burdens vs benefits of procedures
Palliative Care of Wounds: “SPECIAL”

- **S**=Stabilize the wound
- **P**=Prevent new wounds
- **E**=Eliminate odor
- **C**=Control pain
- **I**=Infection prophylaxis
- **A**=Absorbent wound dressings
- **L**=Lessen or reduce dressing changes

Challenges of Palliative Wound Care

- Association of palliative wound care with “giving up”
- Family reluctance
- Physician reluctance
- Lack of information about the severity and/or irreversibility of illness
- Cultural/political attitudes toward death, terminal care, and pressure injuries (commonly viewed as a failure of the caregivers)
Summary

• With increase in life expectancy and more people living with chronic illness we’re caring for a frail population with increase risk of developing wounds
• Interdisciplinary approach to wound care
• Recognition of palliative wound has the potential to curtail suffering and decrease healthcare costs.
7. Nagwa, et al Ind J Derm 2012: 57 (3); 181-186