The Role of Cosmeceuticals and Skin Care in an Aesthetic Practice

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DISCLOSURES

• Galderma
• Allergan
• Procter and Gamble
• Ranbaxy
• Revance
• Valeant
• Aclaris
• Biopelle
• Ferndale

• Popularity and growth of minimally invasive procedures
  - 8,000 people a day turn 65!
  - increased 6% last year
  - Americans spent over $1.8 billion dollars on non surgical skin rejuvenation procedures 2012
  - "lipsick" effect → "injection effect"
  - social media driving cosmetic procedures

• ASDS consumer survey
  - most bothered by midface and sagging
  - very concerned about excess weight anywhere
  - hair loss
  - 83% considering cosmetic procedures
  - major demographic is working women (41-60)
• ASDS survey (212) – procedure breakdown
  - neuromodulators – 1.5 million (6.1 million injections)
    - 89% female
  - soft tissue fillers – almost 1 million
    - 92% female
  - increase soft-tissue filler treatments 2011-2012: 10.4%

Customizing and Combining Treatments

• Global improvement
  - skin quality – tone, texture, blemishes, dyschromias
  - muscle relaxing
  - volume replacement – "contour"
  - tightening
  - re-draping, refiling
  - four "R"s: relax, refill, resurface, redrape

• "Perfect" Face
  - skin care, topical-salicylic, cosmeceuticals
  - peels, microdermabrasion
  - lasers, lights, IPL, RF, ultrasound
  - toxins, fillers
  - heart – shaped or oval faces – periphery (lateral > medial; superior > inferior)

• Body
  - contouring devices
  - sclerotherapy
  - hair removal

Top Five Minimally Invasive Cosmetic Procedures

• Botulinum Toxin
• Soft tissue fillers
• Chemical peels
• Laser hair removal
• Microdermabrasion

Cosmeceutical market has grown significantly over last two decades
• Global skin care market will reach $196.67 billion by 2024
• Sales of products in physicians offices may reach $1 billion by 2017
• US
  - Over 80% physicians dispense cosmeceuticals
  - 75% physicians have at least one non-medical treatment room
  - Only 61% patients leave office after laser treatment with recommendation for long-term skin care regimen
• Blurring of lines of distinction between OTC and dispensed skin care products
• Quality of OTC products → choices, options, questions
Patient Concerns

- Dryness
- Redness, inflammation
- Discoloration
- Antiaging, wrinkles
- Acne, rosacea, pores
- Hair growth

Product Categories

- Sunscreen
- Hydration/barrier repair
- Antioxidant
- Anti-inflammatory
- Pigment lightening
- Collagen repair

Oxidative Damage

- Oxidative stressors create inflammatory pathways → formation of free radicals (highly reactive molecules with unpaired electrons)
- Cellular damage to
  - cell membranes
  - lipids → lipid peroxidation
  - proteins
  - DNA → DNA damage → collagen breakdown
- Inflammation, photodamage, carcinogenesis
- Antioxidants – neutralize damaging free radicals
  - protect cells from endogenous stress (by products of cellular energy)
  - protection from exogenous stress (UVI pollution, cigarettes, ozone)

Antioxidants

- Vitamin A – retinol
- Vitamin B
- Vitamin C – photoprotective, ↓ immunosuppression
- Vitamin E

Antioxidants-Antiinflammatories

- Niacinamide ($\beta_3$) – improves barrier function
  - ↑ synthesis lipids (ceramides and FFA's)
  - ↑ epidermal proteins (keratin, filaggrin)
  - humectant (panthenol $\beta_5$)
- Polyphenols – flavonoids
  - soy - ↑ skin thickness
  - green tea - ↓ sunburn cells, erythema
  - coffee berry - ↓ UV induced erythema
  - grape seed extract

Antioxidants-Polyphenols

- Plant derived
- Antioxidant, antiinflammatory, photoprotective, anticarcinogenic (inhibit activator protein 1) (AP-1)
- Grape seed extract – dermal wound healing – induce vascular endothelial growth factor expression on keratinocytes
- Resveratrol – phytoalexin – skin of grapes and red wine (viniferins) - protect plants from stress, UVL
  - ↑ cathelicidin expression
- Sirtuins – enzymes – activated by resveratrol
  - ↑ DNA repair → ↓ cell senescence
### Polyphenols - Flavonoids
- Isoflavones – genistein, daidzein
  - tofu, soy beans (fermented soy products)
  - antioxidant, antiinflammatory, anticarcinogenic, photoprotective
  - function as phytoestrogens → increase skin thickness through estrogenic effect
  - ↑ collagen production and elastin repair
  - Serine protease inhibitors
    - STI (soybean trypsin inhibitor) – inhibits melanosome transfer to keratinocytes → skin lightening
- BBI (Bowman–Birk inhibitor) – inhibits hair growth

### Antiinflammatories
- Botanicals – ↓ proinflammatory mediators (cytokines, PG’s)
  - oats – avenanthramides
  - olive oil
  - licorice extract
  - lycopene, mangosteen
  - feverfew
  - chamomile, aloe vera
  - curcumin
  - caffeine

### “Neutraceuticals”
- Oral supplements or flavored beverages
- Green tea, soy, grape seed extract
- Carotenoids-Lycopene, Lutein, mangosteen
- Resveratrol (and sirtuins)
- Polypodium leucotomos extract – antioxidants, ↓MMPS, ↓thymine dimers
- Co enzyme Q₁₀, vitamins C and E
- Alpha – 3 – omega acids
- “Nutricosmetic” – oral + topical

### Supplements
- Heliocare
  - polypodium leucotomos extract derived from fern
  - polyphenol enriched
  - antioxidant, photoprotective, anti-inflammatory
- Niacinamide (vitamin B₃)
  - NMSC, ? Melanoma
- Viviscal
  - shark cartilage, protein

### Nutrafol
- proteins, antioxidants, anti-inflammatories (curcumin)
- saw palmetto (DHT blocker)

### Lumity
- amino acids, vitamins, minerals, antioxidants
- glycation, insulin resistance, telomere shortening

### Pigment Lightening
- Tyrosinase activity
  - Hydroquinone
  - Kojic acid – binds to copper
  - Vitamins C and E, Azelaic acid
  - Arbutin (bearberry plant)
  - Licorice extract
  - Fatty acids (lindeic acid) – tyrosine degradation
- Melanin transfer
  - Niacinamide (B₃) – melanosome transfer
  - Soy (STI)
**Lines for Pigmentation**

- **OTC**
  - Olay Pro X Even Skin Tone-niacinamide,
  - Neutrogena Rapid Tone Repair-HA, vit C
  - Aveeno - soy
  - Clinique - Dark spot corrector
- Dispensed
  - Lytera - retinol, linoleic acid, niacinamide, licorice
  - Skinceuticals pigment regulator - kojic acid

**Collagen Repair**

- Peptides
  - Wound healing
  - Stimulate collagen production by fibroblasts
  - Regenerist
    - Niacinamide, peptides, pal KTTKS
- Retinol
  - Neutrogena Rapid Wrinkle Repair – HA
  - ROC
  - PCA, Sente

**Skin better**

- Alpha Ret
  - Retinoid combined with lactic acid
  - Glycolic acid, peptides, glycerin, niacinamide
- Lines
  - Interfuse technology → large Has can penetrate through lipid barrier
  - Peptides, vitamin C
- Face – polyphenols (olive trees), peptides
- Eyes – HA, neuropeptides, vitamin C, caffeine
- Alto serum - antioxidants

**Collagen Repair - Growth factors**

- Act as chemical messengers between cells
- Regulatory proteins that attach to cell surface receptors
- Enhance wound healing, vascular neogenesis
- Induce collagen and GAG formation, grenz zone collagen → thicken epidermis
- Sources
  - cultured human cells
  - generically engineered microorganisms (can be produced in bacteria and yeast)
  - Adipose stem cells
  - Plant stem cells
- Cannot be synthetically created

**Growth Factors**

- Bio-Gel
  - biorestorative hydrogel
  - PSP + hyaluronic acid
  - oil free
- TNS Essential Serum
  - growth factors
  - antioxidants, matrix proteins, peptides
- Regenica recovery gel

**Stem cells**

- Wound healing, burns, e. bullosa
- Source: adipose tissue, blood, plasma, plants
- Topical creams: pluripotent stem cells stimulate collagen, elastin and fibronectin
Tensage
- Growth factor serum secretion derived from snails
- Generated during stress to regenerate damaged tissue (extrinsic aging)
- Stem cell cream also derived from snail eggs
- Pluripotent cells activate skin stem cells within hair follicle bulge – migrate and differentiate into keratinocytes and fibroblasts (intrinsic aging)
- Retinol, peptides, vitamins C and E

Alastin Skin Nectar
- Anhydrous lipid gel
- Elastin – decreases with age
- Tropoelastin – water soluble elastin monomer made by dermal fibroblasts secreted into extracellular matrix cross linked to form elastic fibers and collagen
- Trihex technology – contains proprietary blend of peptides
- Antioxidants, ceramides, niacinamide, HA
- Post procedure, hydration

Organic
- Complementary and alternative medicine
- USDA: organic food – no pesticides, herbicides or hormones
- No certification for “body” products – hard to define “natural”
- Some natural organic ingredients: “oil” form, contact dermatitis
- Some products contain additives and preservatives
- Variations in growing conditions (soil, water, climate)
- Synthetic (made in lab) – not necessarily “bad” for you!

Natural ingredients found in skin care products
- Botanicals: preparations made from plants (e.g., herbs, roots, flowers, fruits, leaves or seeds) that are valued for medicinal or therapeutic properties, flavor, and/or scent.
- Essential oils: obtained by cold press, steam, or dry distillation from cells, cavities, glands, roots, stems, leaves, flowers, fruit, seeds, and hairs of plants (without any chemicals).
- Natural oils
  - Mineral oil
  - Vegetable oil

Ingredients patients are asking about

Nanotechnology
- Rapidly growing field
- Nanoparticles are 1-100 nanometers (nm)
- Targeted active ingredient delivery system
- Skin Care: sunscreens, cosmetics, moisturizers, deodorants, perfumes
- Anti-aging products: retinoids, antioxidants, growth factors, neurotoxins, vitamins
- Benefits of nanoemulsions: stabilization, targeted delivery and deep penetration
- Safety concerns: can generate reactive oxygen species, toxicities due to penetration of intact skin.
Exfoliation

• Mechanical
  - microdermabrasion
  - cloths
• Chemical
  - retinoids
  - salicylic acid, LHA
  - alpha hydroxy acids

Emerging Technologies: Home Devices

• Cleansing
• Exfoliating
• Acne
• Antiaging
• Unwanted hair

Recommendations

• Protect and repair
• Sunprotection, antioxidants and retinoids, peptides
• Combinations with complementary benefits
• Combine with in-office procedures