Intense Pulsed Light Alone in the Treatment of Actinic Keratosis

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Actinic Keratosis

- Prevalence in U.S.A is over 57 million
- 1-15% can progress to SCC
- Cause is thought to be DNA mutation affecting p53, viral DNA(HPV), RAS mutation
Diagnosis: Actinic Keratosis: the cameleon

- Dermoscopy
- Clinically
- Histologically
- Confocal Microscopy

- Bcc
- Seb ker
- Scc
- Bowens disease
- Wart
- SLE
- Porokeratosis
- Rosacea
- Melasma
- Eczema
- Psoriasis
- Lichen Planus
- Lentigo
- Lentigo maligna
- Normal skin
Appearance: Actinic Keratosis

- **Dermoscopy:**
  - "strawberry pattern"
  - prominent follicular openings surrounded by a white halo
  - pigmented AK on the face include multiple slate-gray to dark-brown dots and globules around the follicular ostia, annular-granular pattern and brown to gray pseudonetwork
Appearance: Actinic Keratosis

- Clinical
  - Pre-clinical AK
  - Classic AK: scaly with surrounding erythema
  - Hypertrophic AK
  - Atrophic AK
  - Cutaneous Horn
  - Lichenoid AK
  - Pigmented AK
  - Actinic Chelitis
  - Bowenoid AK
Treatment: Actinic Keratosis

- Field Therapy
  - 5-FU
  - Diclofenac
  - Imiquimod
  - Ingenol mebutate gel

- Focal Destruction
  - Cryotherapy
  - Acid destruction
  - Laser destruction
  - PDT
    - Use of Levulan with different light sources, including IPL
Protoporphyrin IX absorption
Absorption
Intense Pulsed Light

- Intense pulsed light (IPL) is a filtered flash lamp device that emits a non-coherent polychromatic radiation (420-1500 nm)

- IPL has also been used to activate photosensitizers in the treatment of photorejuvenation and actinic keratosis

- In studying the effectiveness of IPL in activating different photosensitizers, a few split-face studies were conducted: IPL alone VS IPL + Levulinic Acid
Question?

Did IPL alone treat Actinic Keratoses?
Method

- A literature search was done to identify information on IPL split-face photodynamic therapy studies in the treatment of actinic keratosis up to April 2016. The databases of Google Scholar and Ovid MEDLINE were searched using the Boolean string: (Intense pulsed light AND actinic keratosis).

- The references were reviewed for split-face studies, where IPL had been used as a control against the contra-lateral IPL + topical aminolevulinic acid (ALA). The references cited in the papers identified were also reviewed.
## Results

<table>
<thead>
<tr>
<th>Ref</th>
<th>Site</th>
<th>Light source</th>
<th>( \Delta ) (nm)</th>
<th>Setting</th>
<th>frequency</th>
<th># Tx</th>
<th>Age</th>
<th># Pts</th>
<th>Fitzpatrick type</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold et al</td>
<td>Face</td>
<td>Vasculight IPL</td>
<td>550-570</td>
<td>34j/cm² Double pulsed 8x16mm spot</td>
<td>Monthly</td>
<td>3 (judged 3 mo after)</td>
<td>37-63</td>
<td>13</td>
<td>I-IV</td>
<td>53% clearance vs 85% with ALA</td>
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<tr>
<td>Tadiparthi et al</td>
<td>Lumina IPL</td>
<td>monthly</td>
<td>5</td>
<td>65-86</td>
<td>8</td>
<td>I-II</td>
<td>55% clearance vs 60% with methyl-ALA</td>
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<tr>
<td>Haddad et al</td>
<td>face</td>
<td>Vasculight ESC Lumenis</td>
<td>515</td>
<td>20j (1 pt) 25j (2 pts)</td>
<td>1</td>
<td>1 (judged results 8 weeks after)</td>
<td>3</td>
<td>I-IV</td>
<td>7% clearance</td>
<td></td>
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</tbody>
</table>
Supporting Data


- In treating “photoaging” IPL alone improves tactile roughness equally to IPL + ALA


- Reversed AK with combination of Q switched 532nm and 1064nm lasers
Discussion

- IPL is a device that targets red or brown lesions
- Actinic keratoses initially present with redness and some with pigmentation
- IPL alone should be studied further for effectiveness in treating actinic keratosis