Integrating Electrical Impedance Score into Decision to Biopsy Increases Biopsy Efficiency

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Conflict of Interest Disclosures: Dr. Rigel is a consultant for Scibase.
**Background**

• Number needed to biopsy (NNB) = measure of diagnostic accuracy
  \[
  \frac{\text{number of lesions biopsied}}{\text{number of lesions that are positive for a disease outcome}}
  \]

• Electrical impedance spectroscopy (EIS) can be used to increase biopsy efficiency

• EIS device yields a positive (higher suspicion for malignancy) or negative (very likely to be benign) score

• **Objective:**
  • *Determine if NNB for skin cancer and melanoma is significantly impacted by the addition of EIS score.*

Methods

• Post-hoc analysis of data of over 1,900 patients with suspicious pigmented lesions who underwent evaluation with EIS and biopsy

• NNB w/o EIS:
  \[
  \frac{\text{total number of lesions biopsied}}{\text{number of histopathologically proven skin cancers and melanomas}}
  \]

• NNB w/ EIS:
  \[
  \frac{\text{number of lesions biopsied w/ positive EIS}}{\text{number of histopathologically proven skin cancers and melanomas in this cohort}}
  \]

![Image of Nevisense Score and NPV/PPV percentages](Malhevy. BJD. 2014;171(5):1099-1107.)
• N=1943, EIS positive=1407

<table>
<thead>
<tr>
<th></th>
<th>Without EIS</th>
<th>With EIS</th>
<th>% Change</th>
<th>p- value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Skin Cancer</td>
<td>5.91</td>
<td>4.41</td>
<td>↓25%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Melanoma</td>
<td>7.33</td>
<td>5.50</td>
<td>↓25%</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
Conclusions

• Prior studies have found NNB for melanoma from 11.9-39.
• The low baseline NNB for melanoma found in this study may be due to inclusion of a lesions cohort with a higher prevalence of melanoma.

• Conclusion:
  • *EIS score significantly reduced NNB for skin cancer and melanoma overall.*
  • *EIS score can be used as an adjunct to augment diagnostic accuracy, increase biopsy efficiency, and reduce associated costs.*