COMPARISON OF THREE SKIN PRICK TEST METHODS IN THE PAEDIATRIC CLINIC IN CAMPBELLTOWN HOSPITAL

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ABSTRACT

Background
Skin prick testing (SPT) is the primary mode of diagnosis for immediate IgE-mediated allergy. It is widely practiced, carries very low (but not negligible) risk of serious side-effects to patients and provides high-quality information when performed optimally and interpreted correctly. SPT is a time consuming allergy assessment in the paediatric clinic. Newer devices are available that may streamline and simplify this procedure. We wish to compare performance of these devices with the traditional method of using a metal lancet to assess performance characteristics and acceptability for our young patients.

Methods
Patients 5-16yrs requiring skin testing to aeroallergens were asked to participate. After informed consent, SPT was performed with six aeroallergens and positive and negative controls. We used a traditional method (Feather® Disposable Blood Lancets) and Multi-Test® II (Lincoln Diagnostics) in 16 patients and Multi-Test® PC (Pain Control) in another 16 patients. Wheal size of each aeroallergen was measured in mm and diameters compared. The operator was timed performing each test. The Wong Baker Pain Faces Scale ratings were administered following performance of skin tests, to ascertain the preferred method and level of discomfort experienced by each child.

Results
Wheal size for histamine control and aeroallergens showed good concordance but there were some minor differences in wheal size for positive control performed with different techniques. The median time taken for metal lancets was 1 minute 12 seconds, compared to both Multi-Test devices which were performed in 7 seconds. Pain ratings for the metal lancets (median range) was 6 and with both the multi-test devices was 2. Patients show a clear preference for both Multi-Test devices, with Multi-Test PC being the most preferred method.

Conclusion
The two Multi-Test devices were both quicker to use and less painful. Reagent consumption of Multi-Test devices compared to Metal Lancets was less. Patient preference favoured the Multi-Test devices.

BACKGROUND

Skin prick testing is widely used to diagnose IgE mediated allergy. The traditional method using metal lancets is time consuming and a source of discomfort for children. We sought to find a quicker, less painful and more cost effective way of performing this widely practiced diagnostic procedure in the paediatric population.

METHODS

Patients who presented to the paediatric Immunology/Allergy outpatients clinic at Campbelltown Hospital who have aeroallergen skin prick testing were asked to participate in our study. SPT was performed on both arms using a standard battery of aeroallergens and positive (histamine 10mg/ml) and negative controls (glycerosaline). A standardised panel of aeroallergens manufactured by Stallergenes (Europe) or ALK-Abello (Europe and USA) were used.

The right arm was selected for the traditional method of Feather® Disposable Blood Lancets and either the Multi-Test® II (Lincoln Diagnostics) or Multi-Test® PC (Pain Control) was used on the left arm. 16 patients had SPT with metal lancets on one arm and Multi-Test® II on the other arm. Another 16 patients had metal lancets on one arm and Multi-Test® PC device on the other arm. The time taken for each of the techniques was documented. After the procedure the participants were asked which method was less painful using the Wong Baker pain rating scale. Relative costs of performance of the same battery of skin tests were calculated for each method.

RESULTS

Overall, the results show a patient preference for the multi test devices with Multi-Test® PC being the most preferred device. These devices allowed quicker performance of SPT and were less painful compared to metal lancets using the Wong baker scoring system. Another important aspect of SPT performance in a busy clinic is the time taken for performance of the test. The average time taken for metal lancets was 1 minute 12 seconds compared to Multi-Test devices which were performed in 7 seconds. Cost of reagent consumption is important in considering the overall economy (and therefore cost-efficiency) of Multi-Test® II and PC compared to metal lancets. The Multi-Test® II and PC uses approximately half the amount of reagent (~25 microlitres compared to ~50 microlitres) and so twice as many tests (200 compared to 100) per ml of reagent can be performed compared to using metal lancets partially offsetting the greater cost of the multi test device.

Comparison of Wong Baker Pain Scale Between Feather Blood Lancets and Multi-Test® II

<table>
<thead>
<tr>
<th>SPT Lancet Systems</th>
<th>Volume reagent (per test)</th>
<th>Number of tests (Per 5ml reagent)</th>
<th>Reagent Cost (Per 6 allergen panel)</th>
<th>Cost of Devices (Per allergen panel)</th>
<th>Total Cost Per SPT Panel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feather® Disposable Blood Lancets</td>
<td>~50ul</td>
<td>100</td>
<td>$4.80</td>
<td>$0.96 x 12c</td>
<td>$5.76</td>
</tr>
<tr>
<td>Multi-Test® II</td>
<td>~25ul</td>
<td>200</td>
<td>$2.40</td>
<td>$5.80</td>
<td>$8.20</td>
</tr>
<tr>
<td>Multi-Test® PC</td>
<td>~25ul</td>
<td>200</td>
<td>$2.40</td>
<td>$6.30</td>
<td>$8.70</td>
</tr>
</tbody>
</table>

CONCLUSION

Compared to traditional lancets multi test devices allowed quicker performance of SPT. Patient preference was clearly for the multi test devices, however these devices add to disposable costs for the allergy unit, this needs to be weighed up against the time taken for performance of SPT and reagent volume used.