Effect of Sterilization Methods on the Reliability of the ICare Rebound Tonometer

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Abstract

**Purpose.** To determine if cleansing and reuse of probes affected the reliability of the ICare tonometer.

**Methods.** ICare tonometry was performed with sterilization performed via alcohol swabs between patients.

**Results.** No statistically significance change was found when cleaning the probe.

**Conclusion.** The statistical tests obtained from the data do not show a statistical difference between the three groups and in fact show great reliability between the groups.

Fig 1 ICare Accuracy Readouts

Fig 2 Raw Data

Fig 3 Results

Introduction

A multitude of alternative devices are available that can IOP, an one of the most popular and widely used is the ICare rebound tonometer. It is a relatively easy to use handheld device that measures intracocular pressure. The ICare system operates on the rebound tonometry concept, in which a projectile, known as a probe, is accelerated at the cornea with a known force. Once in contact with the cornea the probe rebounds from the cornea back into the machine, which calculates the intraocular pressure by the force with which the probe rebounds.

A drawback to the device is the cost to replace the rebound probe after each use. This study determined whether the probe could be cleansed and reused without sacrificing accuracy.

Methods

ICare tonometry was performed on subjects with the rebound probe being wiped with an alcohol swab 25 times after the first measurement, and another 25 times after the second measurement, and then a final measurement. The data was compiled and then analyzed; looking for trends in the results.

<table>
<thead>
<tr>
<th>Group</th>
<th>Means</th>
<th>Standard deviation</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial measurement</td>
<td>15.71</td>
<td>1.02</td>
<td>50</td>
</tr>
<tr>
<td>After 25 alcohol swabs</td>
<td>15.96</td>
<td>0.94</td>
<td>50</td>
</tr>
<tr>
<td>After 50 alcohol swabs</td>
<td>15.95</td>
<td>0.94</td>
<td>50</td>
</tr>
</tbody>
</table>

Discussion

From a cost efficiency standpoint this study shows that the ICare tonometer probes can be disinfected with alcohol and reused on multiple patients without affecting the reliability of the measurement which could reduce practitioners cost. In previous studies, the risk of infection due to reused probes was determined and found to be very minimal. Disinfection should be used between patients, and according to this study need not be feared to affect IOP measurements.

References