HISTORICAL NOTE

Skin Resistance Measurement in Japanese Acupuncture

Yiu-Ming Wong, PhD
Hong Kong Physically Handicapped and Able-Bodied Association, Kowloon, Hong Kong

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In the last century, the Western clinicians initiated the use of skin resistance measurements for quantifying sweat gland activity as well as assessing anxiety levels. At the same time, acupuncturists used the measurement of skin resistance as a modern diagnostic tool to augment the thousand-year-old acupuncture therapy in Japan. This unique measurement has been called Ryodoraku since 1950. The present article is a brief description of historical aspects of the Ryodoraku and the correlations between skin resistance and various medical conditions.

Acupuncture is a traditional form of medicine that has been practiced in Asian countries for more than a thousand years. The practice involves needling the invisible lines on the skin surface called meridians that have acupoints within and run longitudinally up and down the body. Figure 1 shows a human model built about 300 years ago in Japan with meridians and acupoints outlined.

In 1950, Japanese physician Yoshio Nakatani found that the measurement of skin resistance could be used to differentiate the sites of meridians and acupoints from other skin areas. He also discovered that when the reading was too high or too low, it could reflect certain pathologies. The skin resistance-based diagnosis and relevant acupuncture treatments were named “Ryodoraku,” which translates from the Japanese as “good electrical line” or “good electrical pathway” (Nakatani, 1956). The setting of a Ryodoraku diagnosis is similar to the measurement of galvanic skin response in biofeedback. Figure 2 shows an analog microampere meter made for the Ryodoraku application in 1970.

While the Ryodoraku diagnostic process is an adjunct to the theory of Japanese acupuncture, non-acupuncturist researchers have also found that skin resistance readings provide clues to various pathologies as listed in Table 1.

Based on the above, the rationale of a Ryodoraku diagnosis is quite parallel to modern physiology. Thus, skin resistance measurement is not merely a psychophysiologic instrument for stress management, but it prospectively could be an inexpensive tool for screening status of health and diseases.

### Table. Altered skin resistance correlated to medical conditions

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Description</th>
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<tr>
<td>Genetic disorder</td>
<td>People with cystic fibrosis have higher sodium content in their sweat that enables more efficient electrical conductance than that of normal subjects; thus, the skin resistance is lower.</td>
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<tr>
<td>Kidney disease</td>
<td>Extra fluid and sodium are retained in people with renal impairment; in turn, the skin resistance is relatively lowered.</td>
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<td>Endocrine disease</td>
<td>People with diabetes have reduced sweat glandular activity; thus, the skin resistance is relatively higher.</td>
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<td>Nerve injury</td>
<td>Impaired sympathetic sweat responses reduce palm sweating in people with carpal tunnel syndrome; thus, the skin resistance is relatively higher.</td>
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<td>Inflammatory disorder</td>
<td>People with rheumatoid arthritis have a thinning of the skin collagen and a resultant reduction in water holding capacity; in turn, the skin resistance is higher than that of normal subjects.</td>
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References


