

## Signal Analysis of the Yuan Point in Patients with IBS- Acupoint Diagnosis Technology for Intelligent Acupuncture Robot

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**Objective:** To explore the law and distribution characteristics of acupoint sensitization among the IBS patients with meridian theory and graph theory, for further understanding of acupoint sensitization in clinical practice.

**Methods:** For mathematical modeling, achieve the acupoints and their indications of diseases in the classic books of acupuncture and moxibustion. Establish the acupoint-indications network based on the graph theory and record the topological parameters such as clustering coefficient, vector centrality, etc. For the clinical trial part, the method of cohort study was adopted to include the patients meeting the diagnostic criteria of IBS, and the acupoint sensitivity data was measured through body meridian energy system. The topological indexes obtained by mathematical modeling were introduced to calculate the weighted average of topological parameters of the Yuan point, so as to further analyze its correlation with the disease and compare with the traditional analysis methods.

**Results:** 1. Acupoint - symptom complex network of acupuncture and moxibustion classic books all show "small world effect", among which acupoint nodes' close centrality and feature vector centrality indexes present acupoint specificity, which can be used as acupoint weight index for weighted average algorithm; 2. The original point resistivity abnormality rate of patients with diarrhea irritable bowel syndrome was 40.71%, and that of healthy subjects was 29.49%. The resistance of patients with irritable bowel syndrome was higher than that of healthy subjects. 3. Based on the weighted average algorithm of intermediary centrality or eigenvector centrality, the weighted average of topological parameters of primary point resistance in patients with diarrhea irritable bowel syndrome was higher than that of healthy subjects.

**Conclusion:** 1. Having "small-world effect" may be one of the topological characteristics of acupoint-symptom complex network; 2. The increase of skin primary point resistance in patients with IBS-D is a manifestation of acupoint sensitization; 3. Acupoint Hegu (LI4) sensitization on behalf of the large intestine meridian is one of the specific manifestations of primary acupoint sensitization in patients with diarrhea irritable bowel syndrome; 4. It is a feasible attempt to study and express the law of acupoint sensitization based on graph theory.

### **Biography:**

Tiancheng Xu is an innovator in China, the first Chinese ever who got the Nasser Bin Hamad International Youth Creativity Award. He is Founder of Acubots which invents an acupuncture robot and recognized by Medical Robotics Society, Microsoft, Takeda, Renesas and entered Top 36 of Lee Kuan Yew Global Business Plan Competition. Tiancheng has got Excellent Volunteer for United Nations "MY World" Actions, 1st prize of NECCS and 136 awards in college. He published 34 academic papers and is also a medical science writer with more than 3,000,000 hits. He was protocol supervisor for the 2nd Asian Youth Games and now a member of the China Young Leaders Exchange Network.

### **Research Interest:**

Cancer Alternative therapies, cell therapy, Herbal Drugs Combination Designing

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