IRIDOLOGY: DIAGNOSTIC VALIDITY IN ORTHOPEDIC TRAUMA

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Iridology is a diagnostic method used by some complementary and alternative medical practitioners. It is based on the assumption that the iris presents information on general health, and that specific iris patterns signify specific trauma and disease states.

In this single-blind study, we presented 3 iridologists and 10 optometry students color iris slides of 30 subjects with recent orthopedic trauma to an arm or leg, and 30 controls without trauma history. Validity, sensitivity, and specificity values computed for the 3 iridologists and 10 optometry students showed none to have demonstrated diagnostic accuracy of significance.

INTRODUCTION

COMPLEMENTARY AND "ALTERNATIVE" MEDICINE (CAM) practitioners sometimes utilize a variety of diagnostic methods based on the assumption that the appearance of a specific body surface area represents distant organ systems, disorders of which can be diagnosed by the practitioner. Among these areas and methods are the feet and hands in reflexology, the tongue in traditional Chinese medicine, the spine in chiropractic, and the iris of the eye in iridology. According to Jon Miles, a member of the International Iridology Research Association, there are an estimated 10 000 practitioners of iridology in the United States.[1] Literature on iridology is readily available at health food stores and in the "alternative health" section of bookstores.

Iridology was invented by Ignatz von Peczely, a young man who accidentally broke the leg of an owl he had captured. After observing a dark stripe in the iris at the 6 o'clock position on the same side as the broken leg, he claimed that therefore the iris connected to distant organs. Von Peczely developed iris charts based on his observations and published a book on iris diagnosis in 1880.[2] He also pursued a career in homeopathy.

Bernard Jensen, a chiropractor, has been the most prominent iridology proponent in the United States.[3–7] Iridologists claim to assess subjects' general condition and then use detailed charts of the iris to diagnose conditions (see Figures 1 and 2).[8–14] For example, an inflammation of the right knee would appear in the right iris at 6 o'clock, midway between the pupil and the sclera. Iridology diagnoses are not congruent with known iris manifestations of systemic diseases such as diabetes mellitus, tuberculosis, and rheumatoid disorders.

METHODS

Several iridologists, including Jensen, were consulted for advice on the study design. This study was originally conceived as a prospective, controlled, single-blind study using pre- and posttrauma color iris slides. A prospective test of the hypothesis that an iris change appears as a result of a broken bone was impractical. Approval was obtained from the U.C. Berkeley Committee for the Protection of Human Subjects for the following project.

Color slides of the right and left iris were taken of a subject pool consisting of 358 on- and off-campus athletes participating in an organized team sport (e.g., football, rugby) Close contact was maintained throughout the school year with team trainers and coaches. There was only 1 injury significant enough to qualify for the study population. To provide an adequate number of subjects to make statistical comparisons, the study was mod-

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Figure 1. Iridology chart.[3]

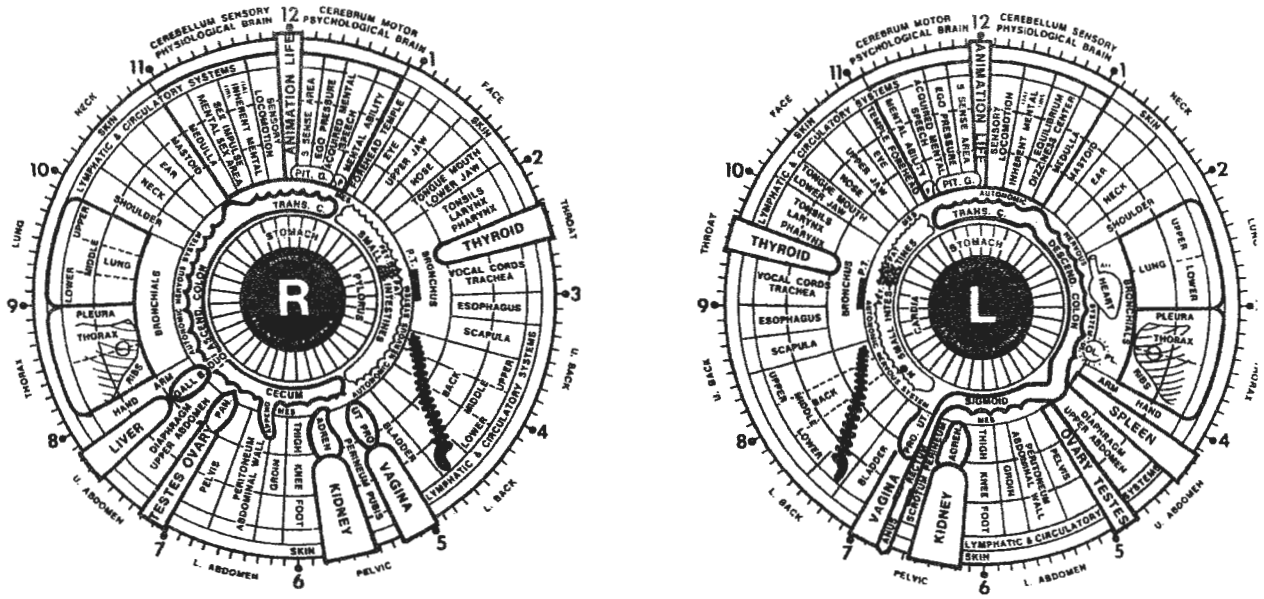
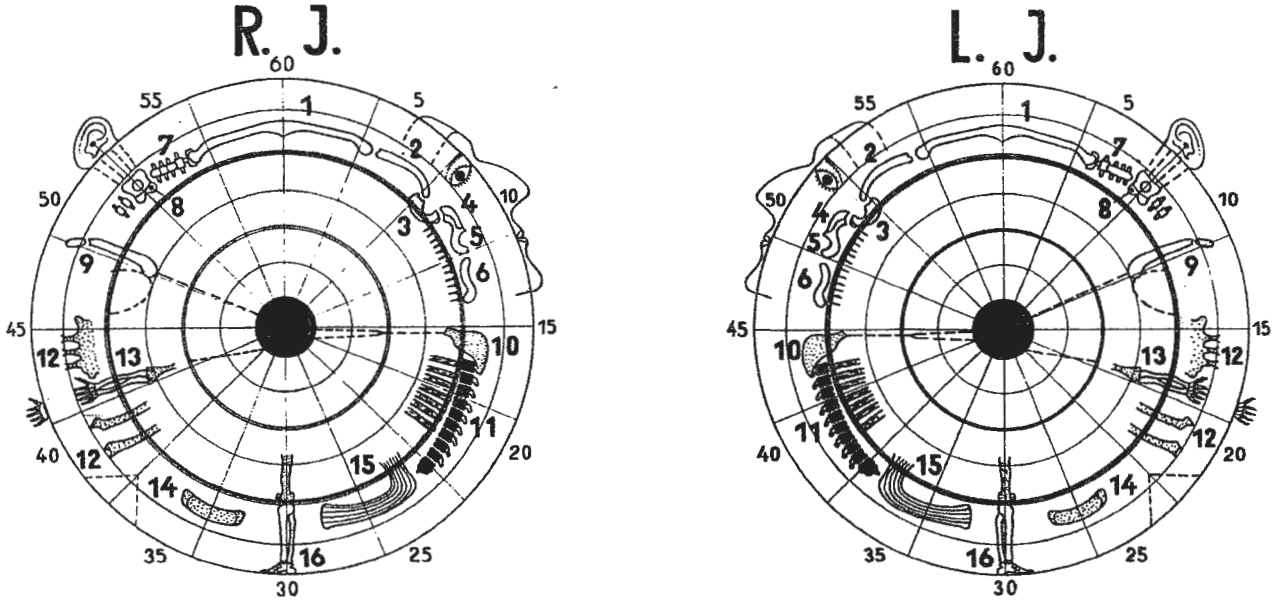


Figure 2. Schematic representation of the right and left eye bone zones: (1) cranial bone; (2) frontal bone; (3) orbit; (4) nasal bone; (5) upper jaw and teeth; (6) lower jaw and teeth; (7) cervical vertebrae; (8) ear; (9) shoulder and clavicle; (10) scapula; (11) spine and ribs; (12) sternum and ribs; (13) hand and arm bones; (14) true pelvis; (15) pelvic crests; (16) foot and leg bones.[10]



ified and the application was amended to include a population of orthopedic trauma patients with extremity fractures admitted at 2 local hospitals.

To isolate the patient from the iridologist and to limit the clinical observation only to the eye, color slides were used instead of direct patient contact. Slides were taken of the right and left iris of fracture patients between the 3rd and 14th posttrauma day. Slides were also taken of subjects with no history of orthopedic trauma, to be used as controls.

An iridologist provided the camera apparatus, which included a Nikon 35mm single-reflex camera mounted on a portable stand with a chin rest and forehead support and integral strobe flash illumination. The slides were screened for quality by a noninterested photographic expert before being selected for the subject pool. Slides of

Table 1. Screening Results by Iridologist (Chance = 50%)

Observer	Validity (True Diagnosis)	P	Sensitivity (True Positive)	Specificity (True Negative)
A	43%* (12/28)†	0.58	40% (8/20)	50% (4/8)
B	55% (16/29)	0.73	62% (13/21)	37% (3/8)
C	47% (14/30)	0.60	52% (11/21)	33% (3/9)

*percent correct
†number correct/number of subjects

Table 2. Screening Results by Observer Group (Chance = 50%)

Observer Group	Number of Observers	Validity (True Diagnosis)	P	Sensitivity (True Positive)	Specificity (True Negative)
Iridologists (total slides)	3	48%* (42/87)†	0.79	52% (32/62)	40% (10/25)
Iridologists (preferred slides)	3	47% (28/60)	0.73	52% (21/40)	35% (7/20)
Optometrists	10	53% (385/729)	0.10	50% (176/354)	56% (209/375)

*percent correct
†number correct/number of subjects

the trauma patients and controls were chosen, coded, and randomized into a presentation set of 30 pairs of right- and left-eye photos.

A number of iridologists were invited to the U.C. Berkeley campus to participate in the review of slides. Three practicing iridologists from northern California accepted. To generate more iridologists' participation, we duplicated the slide set and assembled a package with instructions to mail to iridologists. Despite this recruitment effort, no additional iridologists enrolled in the study.

The 3 iridologists and a group of 10 optometry students participated in the study. The students were given a brief introduction to iridology and an iris chart. Each participant was presented with the 30 pairs of slides projected side by side onto a high-quality screen. Each observer rated each slide for quality, indicating its status as preferred, nonpreferred, or unacceptable. For each pair of preferred and nonpreferred slides, the observer indicated whether orthopedic trauma to an extremity was present in the subject.

The study subjects were placed into 2 groups: those with recent orthopedic trauma and those with none. The responses were analyzed to determine if the observers could reliably distinguish these 2 groups ($p < .05$). Values for validity (correct diagnosis), sensitivity (true positive), and specificity (true negative) were calculated for each iridologist and optometry student. Separate calculations were performed for the preferred slides and for the combination of preferred and nonpreferred slides. Slides judged unacceptable by each observer were not included in the calculation.

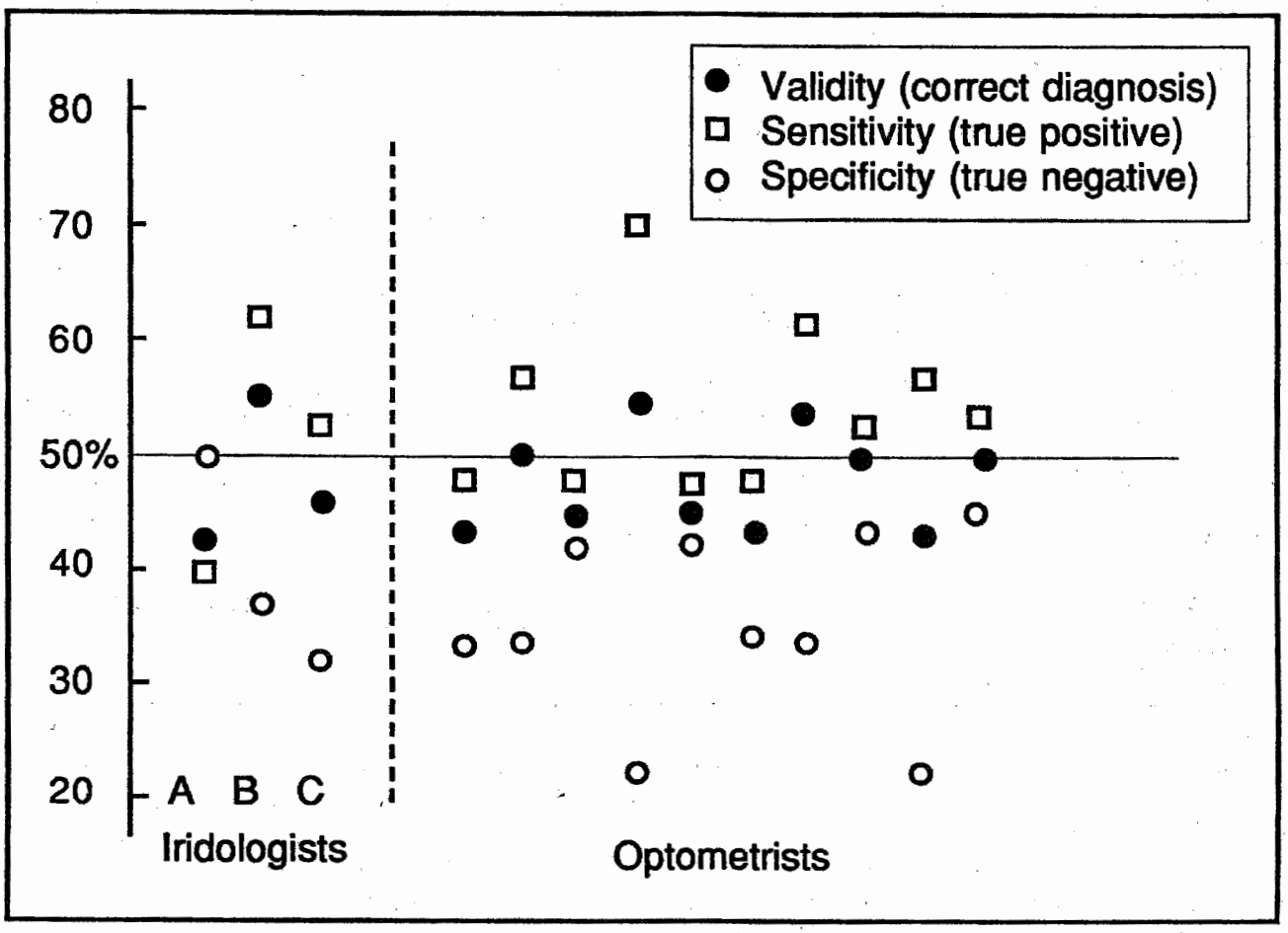
Results

The results are summarized in Tables 1 and 2. None of the diagnostic sets of iridologists or of the optometry students approached statistical significance for accuracy. The results of the iridologists were worse when only the preferred slides were considered. Iridologist B demonstrated the highest correct diagnosis rate, with a sensitivity of 0.62. However, iridologist B also demonstrated a low specificity of 0.37, indicating that according to his estimate, 63% of the controls had trauma when none was present. The scatter plot in Figure 3 illustrates the random nature of the data relative to the 50% guessing line.

Discussion

The Berkeley iridology study was designed to remove ambiguity of diagnosis by using subjects with orthopedic

Figure 3. Scatter plot of the percent of correct responses by observer for validity, sensitivity, and specificity. The 50% line is the response rate expected by chance.



trauma verifiable on X ray. The experiment closely resembled the initial event in iridology as reported by von Peczely.

All iris charts are in general agreement on the locations corresponding to the arms and legs. From the iridology literature, many authors such as Maxwell contend that iridology is well suited to this purpose, stating that "when it comes to emergency medicine—contagious diseases, broken bones—the American approach excels," and that iridology is a "most helpful aid in tracking the remainders of old football fractures and tracing the healing progress of new ones."[11]

Several groups have reviewed iridology over the years.[15–20] Other studies comparing iridologists' findings to reliable medical diagnoses fail to demonstrate the validity of iris diagnosis.[21–22] There have only been 2 blinded, controlled studies published in refereed journals. Knipschild reported that 5 iridologists were unable to detect gall bladder disease in a series of 39 patients scheduled for gall bladder surgery and 39 controls.[23] Simon, Worthen, and Mitas evaluated the clinical accuracy of 3 iridologists presented with 143 subjects, of whom 48 had significant kidney disease. None of the iridologists demonstrated results approaching statistical significance.[24]

Despite the lack of evidence confirming the efficacy of iridology, proponents claim that iridology cannot be dismissed based on the studies published to date.[25] Proponents may use a number of ways to rationalize their inconsistencies. One may claim to make subclinical diagnoses; that is, sometimes years before there are signs or symptoms of disease. Or one may claim to use iridology to rate a subject's constitution or susceptibility to disease. Another might dispute the medical tests used to confirm a medical diagnosis and may contest existence of the disease. Others may diagnose hypothetical and imagined disorders using terms such as toxic settlement, chronic weakness, or underactivity of an organ or

system.[1,3–5,9] These broad characterizations of a subject's state of health contrast with the detail contained in iris charts, and they are not easily quantifiable for study.

Conclusions

The results of this study demonstrate that none of the observers derived information of significance with respect to the presence or absence of orthopedic trauma. This finding is in agreement with prior studies that evaluated the diagnostic validity of iris signs in identifying subjects with kidney and gall bladder disease. For at least these 3 conditions, iridology is not a reliable diagnostic procedure. However, there is no plausible reason for suspecting that iridologists would perform more accurately in other medical situations using this method. Thus, all controlled trials so far are added to basic implausibility in casting doubt on iridology's validity.

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