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Benefits of *Reiki* Therapy for a Severely Neutropenic Patient with Associated Influences on a True Random Number Generator

Melvin L. Morse, MD,¹ and Lance W. Beem, MS²

Abstract

Background: *Reiki* therapy is documented for relief of pain and stress. Energetic healing has been documented to alter biologic markers of illness such as hematocrit. True random number generators are reported to be affected by energy healers and spiritually oriented conscious awareness.

Methods: The patient was a then 54-year-old severely ill man who had hepatitis C types 1 and 2 and who did not improve with conventional therapy. He also suffered from obesity, the metabolic syndrome, asthma, and hypertension. He was treated with experimental high-dose interferon/riboviron therapy with resultant profound anemia and neutropenia. Energetic healing and *Reiki* therapy was administered initially to enhance the patient's sense of well-being and to relieve anxiety. Possible effects on the patient's absolute neutrophil count and hematocrit were incidentally noted. *Reiki* therapy was then initiated at times of profound neutropenia to assess its possible effect on the patient's absolute neutrophil count (ANC). *Reiki* and other energetic healing sessions were monitored with a true random number generator (RNG).

Results: Statistically significant relationships were documented between *Reiki* therapy, a quieting of the electronically created white noise of the RNG during healing sessions, and improvement in the patient's ANC. The immediate clinical result was that the patient could tolerate the high-dose interferon regimen without missing doses because of absolute neutropenia. The patient was initially a late responder to interferon and had been given a 5% chance of clearing the virus. He remains clear of the virus 1 year after treatment.

Conclusions: The association between changes in the RNG, *Reiki* therapy, and a patient's ANC is the first to the authors' knowledge in the medical literature. Future studies assessing the effects of energetic healing on specific biologic markers of disease are anticipated. Concurrent use of a true RNG may prove to correlate with the effectiveness of energetic therapy.

Introduction

THE NATIONAL INSTITUTES OF HEALTH defines *Reiki* as one of several biofield therapies that are intended to affect purported energy fields that surround and penetrate the human body.^{1,2} The most recent extensive review of such distance and energy field therapies demonstrated minimal effects on biologic systems. Two (2) double-blind placebo-controlled studies documented clinically accelerated wound healing with the intervention of therapeutic touch.³ Although *Reiki* is well documented to decrease stress, pain, and anxiety in patients, there are fewer articles documenting the effects of

energetic healing on specific biologic markers such as white blood cell counts, pulmonary function tests, or other biologic markers of health.⁴⁻⁶

Dan Benor, MD, used a broader definition of energy healing, as "a systematic, purposeful intervention by one or more persons aiming to help another living being by means of focused intention."⁷ Dr. Benor reviewed over 100 well-controlled scientific studies, many published in mainstream scientific journals, showing that spiritually oriented energetic healing has biologic effects on tumors cells in laboratory culture, enzymes, DNA telomerase activity, and increases in hemoglobin counts in patients, among many other examples.⁸

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Previous Studies of the Effect of Consciousness on Random Number Generators

The effect of consciousness on the output of random number generators (RNGs) was first documented by physicist Helmut Schmidt of the Boeing Corporation.⁹ This research was pioneered by physicists¹⁰ and engineers¹¹ and has only recently come to the attention of health care professionals.¹² The entire literature on the human mind's ability to effect RNGs was recently reviewed by Radin.¹³ He determined that meta-analysis of existing studies documented that there is a weak but real effect of consciousness on RNGs. Jahn and Dunne have documented that spiritually significant public events and meditation have the most profound effects on RNGs. However, most of the previous research in this area involves studies of research subjects in laboratory settings with the simple intent of attempting to influence the RNG.

Regardless, this research is solid enough that science writer Carl Sagan stated "that by thought alone humans can 'barely' affect random number generators, in my opinion, deserves serious study."¹⁴

Materials and Methods

Medical treatment

The patient was then a 54-year-old man who had been initially diagnosed with non-A non-B hepatitis in the 1980s, and subsequently was found to have hepatitis C, types 1 and 2. A liver biopsy performed in 1991 showed inflammation only. This progressed to stage 1 fibrosis by 2001 and stage 2 fibrosis by 2006. Liver enzymes always remained mildly elevated.

The patient also suffered from hypertension, type 2 diabetes, asthma, obesity, and the metabolic syndrome. Medications included metformin ER, amlodipine besylate, lisinopril-hydrochlorothiazide, rosiglitazone maleate and glimepiride (Avandaryl 4), amphetamine (Adderall XR), fluoxetine HCl (Prozac), montelukast sodium (Singulair), budesonide (Pulmicort), albuterol, multivitamins, and milk thistle.

The patient did not respond after 6 months of treatment with interferon and ribavirin. After consultation at Thomas Jefferson University, the patient then elected a regimen of high-dose interferon and ribavirin for another 72 weeks. The patient immediately developed profound anemia (hematocrit [Hct] 28%) and neutropenia (absolute neutrophil count [ANC] fluctuating between 800 and 1200).

The patient attended a regular meeting of the Baltimore Spiritist Organization and received a "healing pass" as part of the meeting. Within a week, his Hct increased to 34% and remained at that level for the remainder of his treatment. During the passes he had unanticipated spontaneous visual mental images of activity and healing within his bone marrow.

The patient was treated weekly with 180–240 μg of pegylated interferon (peginterferon α -2a) supplied to the patient by Hoffman LaRoche as part of the Pegasyst Program for Indigent Patients. The patient had his blood drawn every 1–2 weeks several days prior to interferon injections. He would not get scheduled doses if the ANC was <750 , according to the manufacturer's recommendations. The patient was also treated with ribavirin 600 mg bid. This regimen was given a 5% chance of working.

Energetic treatments

Early in the treatment course, the patient's ANC dropped to 670 and his physician recommended ending treatment. The patient received an initial session of healing passes from obstetrician and Brazilian spiritist Marlene Nobre, MD, President of the International Spiritist Medical Association (AME-Brazil). This is an association of physicians and other health care professionals dedicated to the understanding of the spiritual aspects of disease, inspired by Allan Kardec. The tradition of "healing passes" in Brazil is similar to *Reiki* therapy, with similar mental intent and placement of the practitioner's hands on the patient (personal communication, Marlene Nobre, MD). They do not charge for this practice.

Five *Reiki* sessions were then administered by two *Reiki* masters in the community setting, each with 15–20 years experience, over the treatment course. They were informed that the patient was neutropenic. Therapy sessions lasted from 30 to 60 minutes. The practitioners touched the patient lightly as part of their practice. The patient presented to their offices for therapy. A Psyleron device was attached to a small laptop computer and placed on the floor in a semiconcealed spot. Most of the patient paid the practitioners their typical fees and was treated exactly like all other patients seen by the practitioners. The practitioners did not have any specific intent to influence the output of the RNG.

After five *Reiki* sessions, the patient attended a weekend workshop teaching energetic healing to health care professionals. Most of the participants had no previous knowledge or training in energetic healing. He had one treatment given simultaneously by four workshop students. It consisted of their placing their hands over and around his body and visualizing good health for him.

The patient scheduled his own *Reiki* sessions, according to his monitoring of his ANC, and his physician's input as to the likelihood that falling ANC count would soon result in missing doses.

Monitoring energetic treatment with a true random number generator

The sessions were monitored with a RNG developed by Princeton University with a grant from McDonald Douglas Corporation (PsyleronREG). It was purchased through the commercial sales department of Psyleron.com. The machine was calibrated and monitored and documented to produce a stream of random data in over 96 hours of various control situations by being placed in hospital and clinic examination rooms and offices during the night. PsyleronREG is the best known and tested RNG. Its output is calibrated after millions of samplings of electronic noise from a semiconductor.^{15,16}

For example, this is a 15-hour session in which the RNG was placed in the business office of the hospital at which one of the practitioners worked. The total Z score for the entire 15-hour session was 0.03. This graph represents over 100,000 separate trials. None of the trials had a Z score >2 (Fig. 1).

Understanding the graphic output of the RNG

True RNGs create a sequence of random numbers based on natural phenomena such as the decay of radioactive isotopes, chaotic electronic "white noise," or photon emissions from semiconductors.^{17,18} The emissions are filtered and

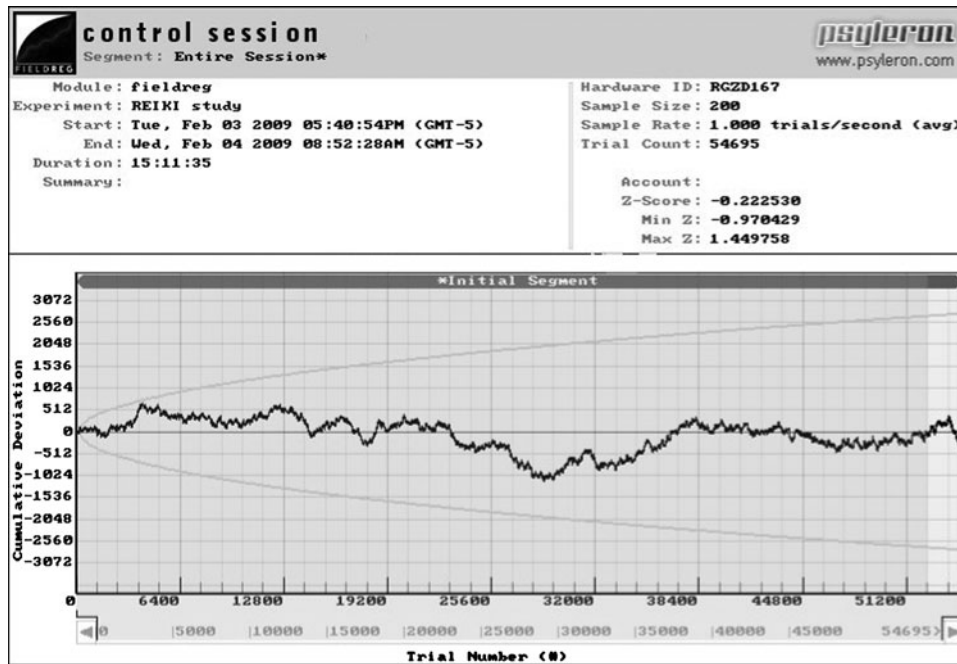


FIG. 1. Hospital business office control session, 15 hours.

sampled to produce a truly random data stream that is significantly different from artificial RNGs created by humans (such as those produced by software algorithms in a computer) in the following ways: (1) The random numbers are generated by measurements of natural chaotic phenomena, and (2) It results in an irregular unpredictable random pattern similar to patterns seen in measurements of brain activity.

Each "trial" for the RNG used in this study consists of a stream of "1"s or "0"s produced by 200 samplings of the electronic noise of the semiconductor. Software then translates this data stream into a visual event, such as the movement of a line on a graph with the X dimensional representing time and the Y dimensional representing the Z scores of each trial. With 200 samplings of the source emissions for each trial, every trial can have a Z score calculated for it. A given trial is significant if its Z score is greater than 2. When the line moves in the positive Y direction, this represents trials with more "1"s than "0"s and the negative direction represents trials with more "0"s than "1"s.

If one could directly experience the output of the RNG, one would see chaotic pulses of light or hear a chaotic white noise sound. The 200 samplings that make up a trial are not graphed, but are available to the researcher.

Any significant deviation of the graph from the center horizontal line represents a quieting of the chaotic behavior of the RNG, whether the graph moves up or down. Theoretically, the graph could visually appear to be basically moving along the center line and still represent a session with a significant influence on the data stream of the Psyleron. If one trial was all "1"s and the next trial was all "0"s, each individual trial would be highly significant and yet the resultant graphic line would fairly flat. However, typically the line moves either up or down in a fairly dramatic fashion.

Because of these unpredictable effects of consciousness on the RNG in terms of the visual graphic output, Dr. Beauregard of the University of Montreal has developed criteria for the statistical significance of a session based only on the Z

scores of the individual trials. A session is determined to be clinically significant if it is 10 minutes of trials with Z scores greater than 2 in a given 30-minute session regardless of whether or not the graphic representation of the data stream moves up or down (personal communication: Dr. Beauregard, who is correlating the electroencephalogram changes of meditation by Carmelite nuns with associated effects on the data stream of an RNG).

The Beauregard criteria are used to identify a session as "significant" in this case report (10 minutes of trials with Z scores >2 per 30 minutes of a session).

Monitoring sessions with the RNG

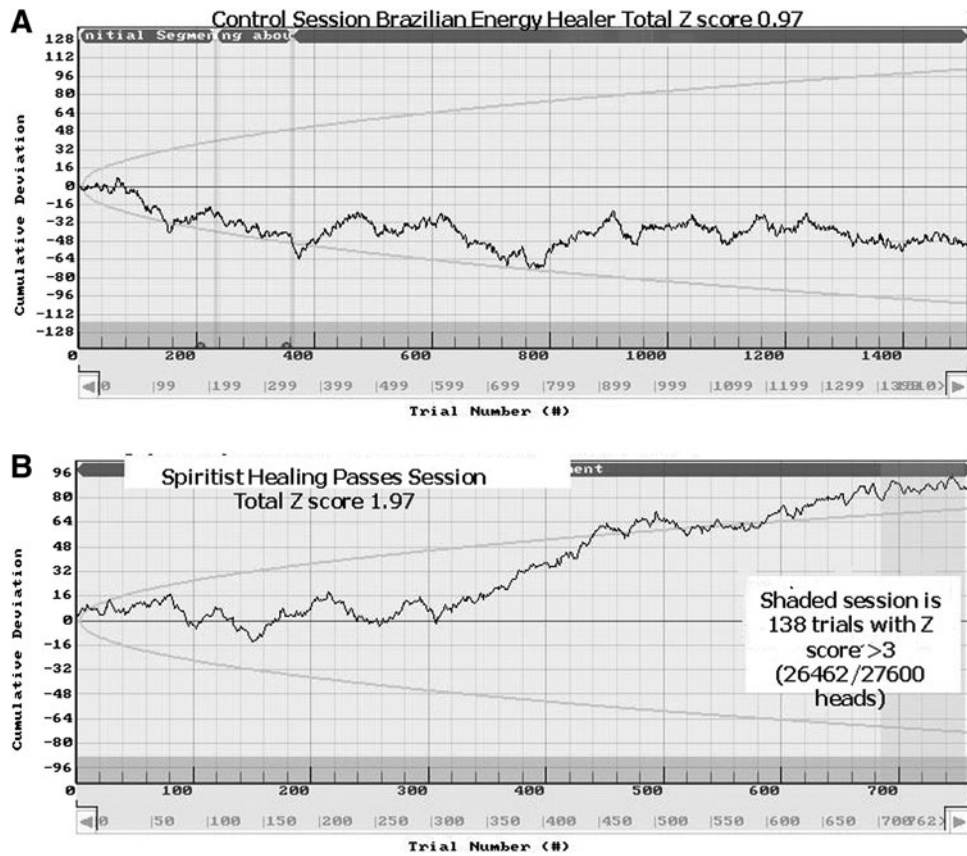
The RNG was brought to the Reiki healing sessions in advance of the patient presenting for treatment. The control sessions were typical activities of the practitioner and the patient prior to a session: chatting, scheduling appointments, paying his bill and other mundane activities. The healer and patient were not instructed in any way concerning the RNG. It was simply placed in an unobtrusive place. They were unable to see the graphic output of the device.

Results

Control session: (Fig. 2A), total of 19.1 minutes, 1146 total trials. Z score was 0.85 for the total session. Three hundred and sixty-five trials had Z scores >2 (6.08 minutes or 31%). This session was immediately followed by the healing passes. The control session consisted of an initial brief prayer, followed by a discussion of Spiritism, the history of the movement, and Allan Kardec. There were several physician/energy healers present.

Healing Passes: (Fig. 2B), total of 12.6 minutes, 759 total trials; 8.62 minutes had Z score >2. The Z score for the total session was 1.974. Sixty-eight percent (68%) of the trials had a Z score of >2 (includes 2 minutes and 18 seconds of Z score >3).

FIG. 2. A. Control session spiritist healing passes began with a prayer. B. Spiritist healing passes session. Absolute neutrophil count nearly doubled after this session.



The patient's ANC rose from 670 to 1250 1 day after the Healing Passes.

As Spiritist Healing passes were not routinely available to the patient, his physician suggested *Reiki* treatments to help with anxiety and general well-being which, according to the physician, might in turn improve bone marrow function.

ANC results after Reiki sessions

On five occasions, the patient became concerned that treatment would have to be interrupted because of declining ANC values. After all five sessions, there was a statistically significant increase in both total white blood cells (WBC) and ANC (Table 1).

TABLE 1. STATISTICAL DATA ON WHICH THE GRAPHS ARE BASED

Character rated Rating data type Rating unit number of decimals	WB Count white blood Ct Number 1	WBC	AN count	ANC	REG	REG	% of	
		increase none vs healing % Increase 1	absolute neutrophil number 1	increase none vs healing % Increase 1	trials trials number 1	Z > 2.0 trials number 1	Z > 2.0 trials % 1	
Trt no.	Treatment name	1	2	3	4	5	6	7
1	Control	2833.3 b	0b	953.3 b	0b	3078.0 a	196.5 b	9.7b
2	Healing sessions	3766.7a	33.2 a	1563.3 a	63.2 a	3714.3 a	1597.3 a	45.2 a
LSD ($p=0.05$)		245.41	9.33	360.25	32.197	1827.76	1107.48	7.53
Standard deviation		165.33	6.28	242.69	21.691	1231.34	746.1	5.07
CV		5.01	37.83	19.29	68.68	36.26	83.18	18.51
Bartlett's χ^2		0.336	0	4.069	0	1.131	13.835	0.03
P (Bartlett's χ^2)		0.562		0.044*		0.288	0.001*	0.864
Replicate F		7.976	1	3.347	1	3.349	0.924	10.015
Replicate prob (F)		0.0199	0.5	0.1055	0.5	0.1054	0.5335	0.0122
Treatment F		95.61	83.848	18.952	25.442	0.801	10.576	146.825
Treatment prob (F)		0.0002	0.0003	0.0073	0.004	0.4118	0.0226	0.0001

*Asterisk indicates statistical significance.

Means followed by same letter do not significantly differ ($p=0.05$, student-Newman-Keuls).

Mean comparisons performed only when analysis of variance treatment P(F) is significant at mean comparison observed significance level.

WB, white blood cell; WBC, white blood cell count; AN, absolute neutrophil; ANC, absolute neutrophil count; REG, random event generator; trt no., treatment number; LSD, least significant difference.

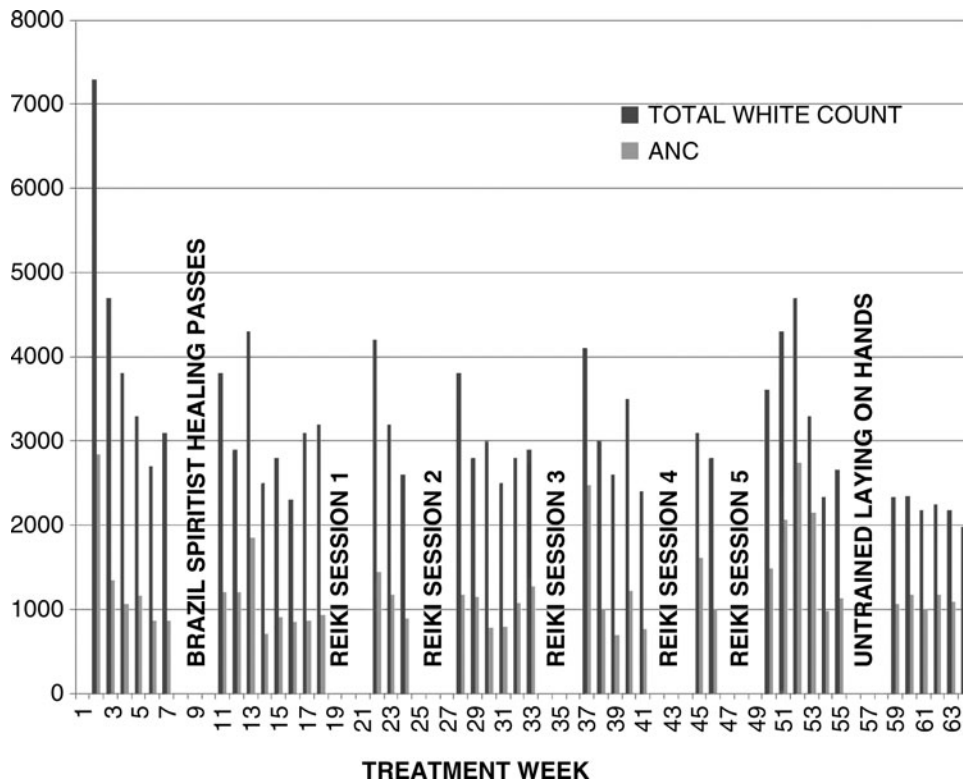


FIG. 3. Changes in white blood cell count and absolute neutrophil count (ANC) over time. Intervention of energetic healing session is clearly indicated.

Total WBC and ANC over time (Fig. 3). As can be seen, as ANCs approached or dropped below 1000, the patient scheduled *Reiki* sessions. There was an immediately and statistically significant improvement of ANC and WBC after the *Reiki* sessions (Table 1).

The WBC and ANC immediately after healing sessions are compared to values in the time immediate before a healing session (Fig. 4). Only the Brazilian Healing passes and *Reiki* session values were used. The Laying on Hands workshop

was done by untrained healers, whereas the Brazilian and *Reiki* sessions were done by healers with at least 15 years' experience. The increase in WBC and ANC after the healing sessions is statistically significant (Table 1).

All five *Reiki* sessions are graphically displayed (Fig. 5). The control sessions are shaded. All five sessions met the Beaugard criteria for a significant session in terms of affecting the output of the RNG. None of the control sessions was significant in their effect on the RNG.

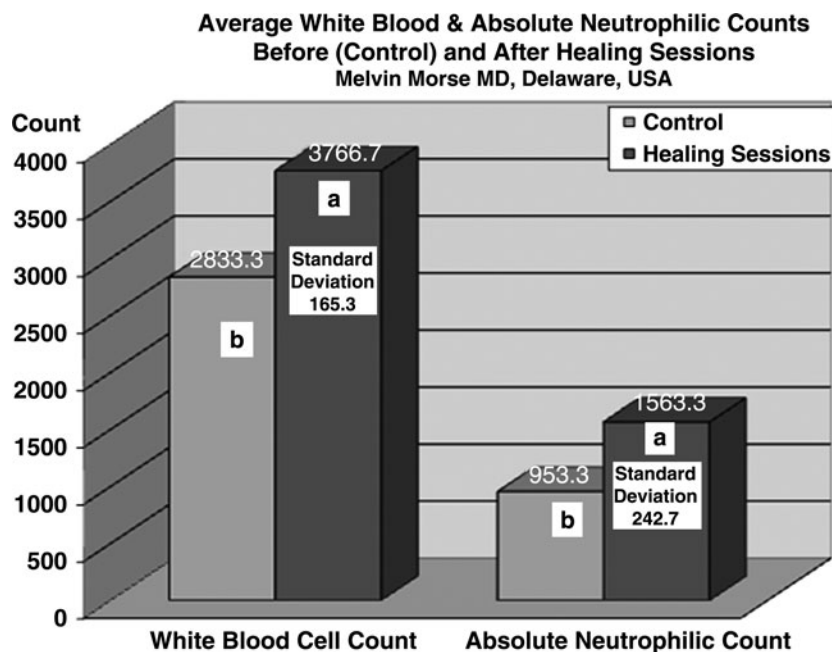


FIG. 4. Before (b) and after (a) healing sessions: white blood cell count and absolute neutrophil count values (statistically significant; see Table 1). Means followed by same letter do not significantly differ ($p=0.05$, Student-Newman-Keuls). Mean comparisons performed only when analysis of variance treatment P(F) is significant at mean comparison observed significance level.



FIG. 5. A. Reiki session 1. B. Reiki session 2. C. Reiki session 3. D. Reiki session 4. E. Reiki session 5.



FIG. 5. (Continued).

Figure 5A shows the control session (40.85 minutes); 18.3% of trials were significant. The *Reiki* session was 36.81 minutes long; 62.29% of trials were significant (significance for a trial means the Z score was >2). Session significance means that 10/30 minutes had significant trials, or 33%.

Figure 5B: The control session was 31.3 minutes; 16.7% of trials were significant. The *Reiki* session was 31.7 minutes; 63.8% of trials were significant (includes 1.28 minutes of Z score >3).

Figure 5C: The control session was 26.6 minutes; 7.5% of trials were significant. The *Reiki* session was 60 minutes; 47.3% of trials were significant.

Figure 5D: The control session was 45.4 minutes; 7.2% of trials were significant. The *Reiki* session was 32.3 minutes.

Forty-eight percent (48%) of trials were significant (includes 1.36 minutes of Z score >3).

Figure 5E: The control session was 33 minutes; 9.8% of trials were significant. The *Reiki* session was 39 minutes. Thirty-six percent (36%) of trials were significant.

Figure 6A: The control session was 36 minutes long; 9.8% of trials were significant.

Figure 6B: The healing session was 27 minutes long; 4.1% of sessions were significant.

Control sessions for the *Reiki* Healing (columns 1–5) and the Laying on the Hands Workshop are shown in Figure 7. None of the sessions was significant by the Beaugregard criteria.

The *Reiki* session (columns 1–5) and the active healing session of the Laying on the Hands Workshop (column 6) are

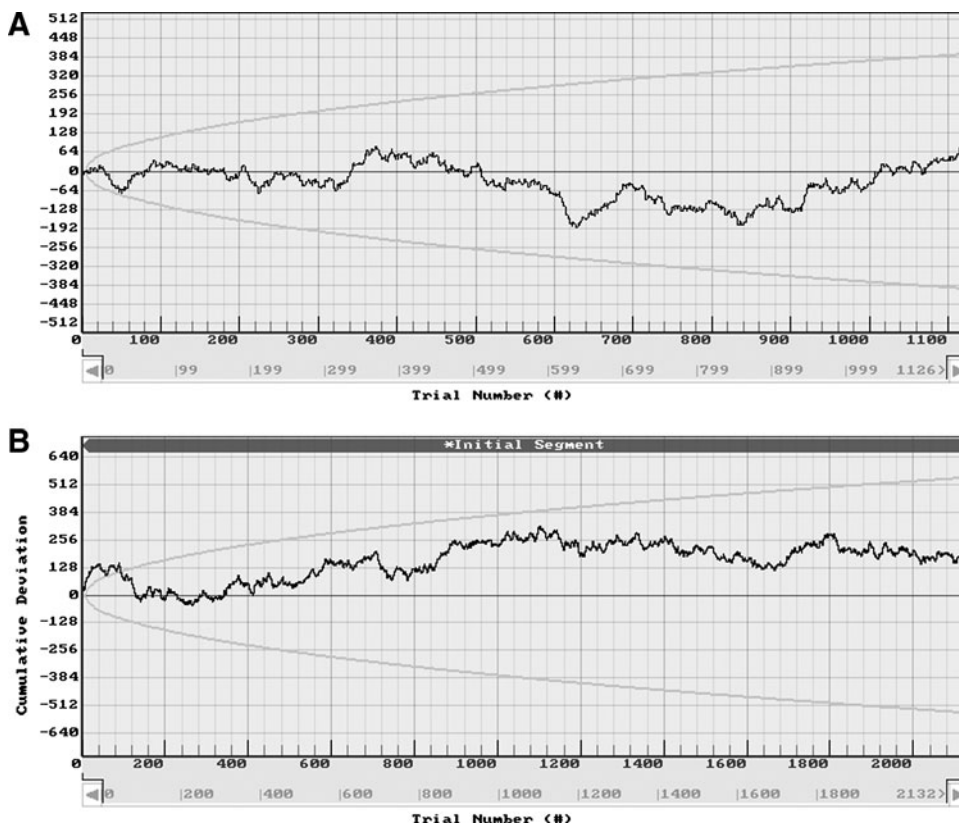


FIG. 6. A. Laying on Hands Workshop control session. B. Laying on Hands Workshop healing session.

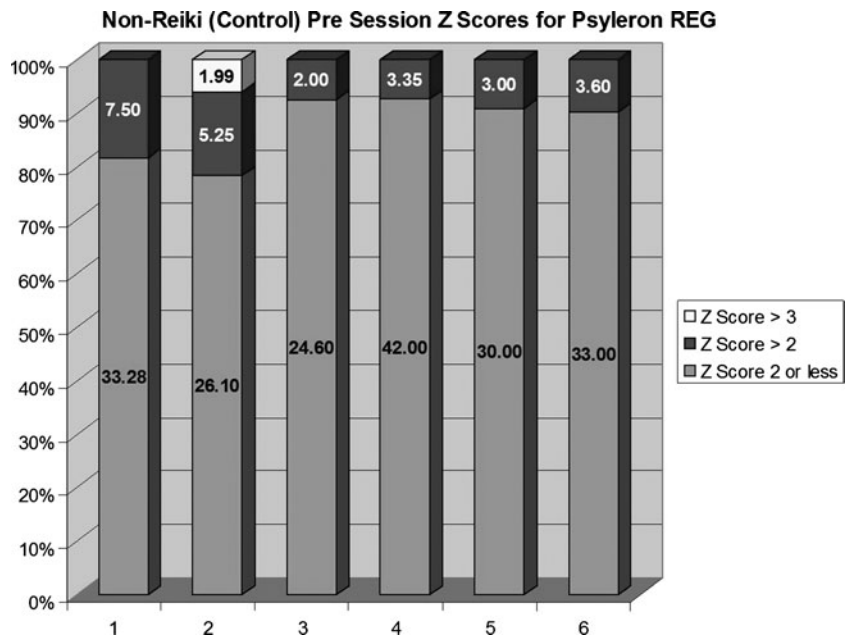


FIG. 7. Five *Reiki* Sessions and Laying on Hands Workshop: Percentage of Z scores <2 and >2. Sessions 1-5 are the *Reiki* healing sessions; numbers in the columns represent total minutes. Column 6 represents the Laying on Hands Workshop.

shown in Figure 8. Numbers within the columns represent minutes.

Table 1 represents the statistical analysis and the presentation of the data on which the graphs are based.

The percentage increase in WBC and ANC before and after the Brazilian Healing Passes and *Reiki* sessions are shown in Figure 9. The column on the right represents the percent increase in Z scores of the control sessions as compared to the energy healing sessions. Data for the Laying on the Hands workshop were not included.

Discussion

This case report documents that for this particular patient, significantly low ANCs responded to *Reiki* therapy. When energetic healing sessions were followed by increases in ANC, they were also associated with statistically significant

changes in the otherwise random data stream of a true RNG. The energetic treatments were quieting the electronically created white noise.

Reiki therapy facilitated this patient in completing 18 months of high-dose interferon therapy. *Reiki* clearly played an important part in his current long-term remission from a condition he had only a 5% chance of recovering from.

This report clarifies differences between the placebo effect and energetic healing. Energetic healing has an effect on biologic systems that can be documented by biologic markers. It is an energetic force or field effect from outside the human body.¹⁹ The placebo effect is defined as originating from the human mind. While placebo has clinical benefits, it has not been shown to have specific effects in terms of biologic markers.²⁰⁻²³

There are some intriguing findings in this study even as a single case study. The lengthy RNG control sessions in nontherapeutic settings such as a business office had Z scores

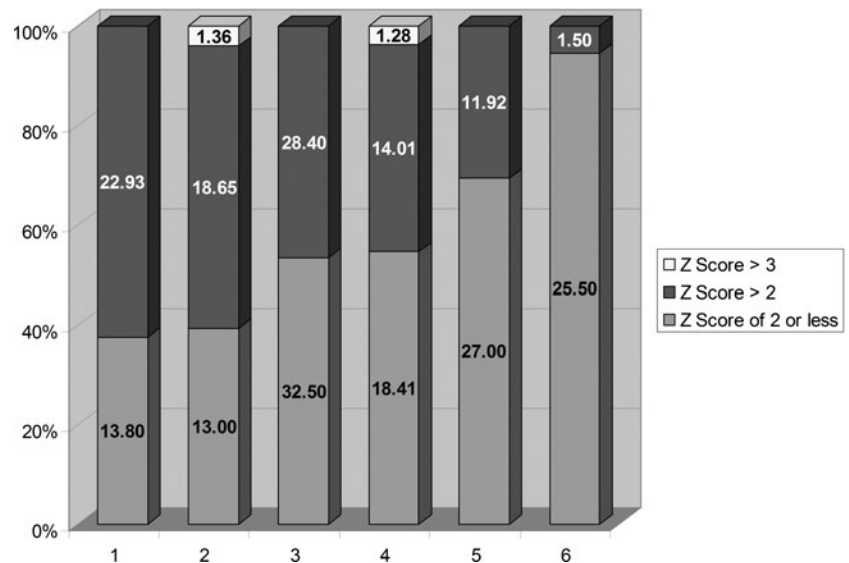


FIG. 8. Five *Reiki* sessions and Laying on Hands Workshop: Percentage of minutes with Z score <2 and >2 for Psyleron RNG. Columns 1-5 are the *Reiki* healing sessions; numbers in the columns represent total minutes. Column 6 represents the Laying on Hands Workshop.

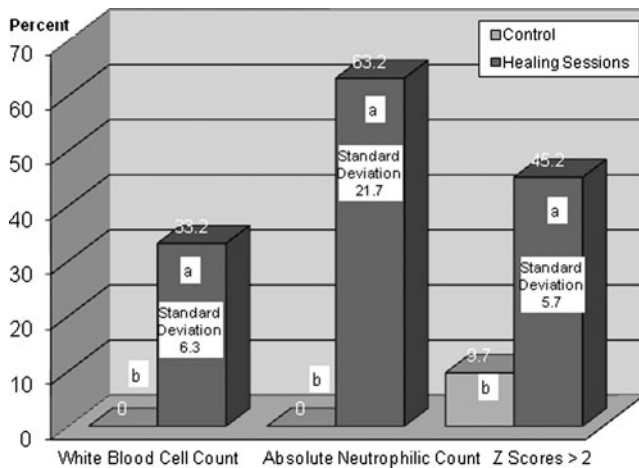


FIG. 9. Percent increase of white blood cell count and absolute neutrophil count, and random number generator trials >2 , for healing sessions (Laying on Hands not included). Means followed by same letter do not significantly differ ($p=0.05$, Student-Newman-Keuls). Mean comparisons performed only when analysis of variance treatment P(F) is significant at mean comparison observed significance level.

of 0.03, as expected, with no trials having a Z score >2 . However, the control sessions in the offices of the Reiki practitioners had total trials with significant Z scores between 7.2% and 18%. There may be some residual factor apparently influencing the output of the RNG, which should be further studied.

In the Brazilian Healing Passes control session, 30% of the trials were statistically significant. This is understandable, as the control session began with a prayer. There were several physician/energetic healers present in the room. Previously, Jahn and Dunne¹² have shown that prayer alone affects the RNG.

The students at the energetic healing workshop did not seem to influence either the patient's WBC or the output of the RNG. Similarly, Radin describes a study in which experienced meditators were able to influence the photon stream of a laser beam, whereas inexperienced meditators could not.²⁴

Other interesting findings include the following: (1) In Fig. 8, the percentage of healing sessions with Z scores >2 appears to drop off over time, in a linear fashion. It is possible that this represents the completion of the healing process. (2) In Fig. 5C, there is considerable variation around the average. As the entire association between the RNG and healing or control sessions was unanticipated, little documentation of the control sessions was done. In future research, the authors anticipate recording the control sessions to better understand the fluctuations seen in them. (3) In several of the control sessions, there are significant alterations in the RNG data 5–10 minutes prior to the Reiki session. Perhaps this represents a marker of a successful session or some sort of "prehealing" phenomena. (4) In the healing sessions, there is overall an increase in the Z scores as the session progresses. This is particularly seen in Fig. 2B, which finishes with over 2 minutes of trials with Z scores >3 . This would perhaps indicate that the energy in the room must accumulate before it can have a significant effect on the electronic white noise of the semiconductor, which is the basis of the RNG.

Conclusions

The authors of this study hope that this case report will encourage future studies of the effects of energetic medicine on specific biologic markers of disease and health. It is believed that true RNGs are useful in clinical research and will also be used in future studies. The authors believe these results are more robust than previous studies of consciousness on the output of RNG because it was taken out of the laboratory setting and practitioners were directly monitored in the clinical arena.

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Disclosure Statement

No competing financial interests exist.

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