Psychoimmunologic effects of Therapeutic Touch on practitioners and recently bereaved recipients: A pilot study

The purposes of this descriptive pilot study were to address conceptual inconsistencies and several other methodologic problems identified in previous Therapeutic Touch (TT) research, while also providing direction for future TT studies by attempting to determine the appropriateness and suitability of a combination of psychologic and immunologic measures in the ongoing empiric evaluation of TT. Research questions were derived from a unitary perspective. Data on both practitioners and recipients were collected and examined for patterns and relationships. Changes that may be related to TT were observed in immunologic, psychologic, and unitary measures. Directions for future research within a unitary framework were postulated.

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THERAPEUTIC TOUCH (TT) is a modern approach to healing that derives from the ancient practice of the laying-on of hands. Research on TT is built on the work by Bernard Grad, Sister Justa Smith, and Dolores Krieger. These researchers studied the phenomenon of laying-on of hands and found that it could increase the rate of wound healing in mice,[1,2] the rate of growth in plants,[2-4] the rate of activity of the enzyme trypsin,[5] and the level of human hemoglobin.[6,7] Outcome studies to date indicate that TT can increase human hemoglobin level,[8,9] induce physiologic relaxation,[10] decrease state anxiety,[11,12] decrease pain,[13,14] decrease diastolic blood pressure,[15] reduce stress in hospitalized children,[16] and accelerate wound healing.[17]

THEORETICAL FRAMEWORK AND PURPOSE

The Rogerian conceptual system has provided the foundation for most of the TT

This study was funded by the Institute of Noetic Sciences, Sausalito, California.

Adv Nurs Sci 1993;15(4):13–26

studies that followed Krieger's initial work drawing on the insights of Eastern philosophic thought. Rogers defines people as irreducible, indivisible, multidimensional energy fields integral with the environmental energy field.[18] In earlier conceptualizations of TT, the idea that there was an "energy transfer or exchange" between the practitioner and the recipient was a primary explanatory theory,[11,12,15] deriving from Rogers' conceptual system and consistent with theoretical explanations offered by earlier researchers.[1-6] More recently, it has been postulated that the TT practitioner, knowingly participating in the mutual human/environment process by shifting consciousness into a state that may be thought of as a "healing meditation," facilitates repatterning of the recipient's energy field through a process of resonance, rather than "energy exchange or transfer."[10,19,20]

In spite of these conceptualizations that the practitioner and the recipient of TT are not separate but are interconnected and integral with the total universal energy field, outcome studies have continued to focus on the effects of TT treatment on recipients and have ignored the effects of treatment on the practitioner. This focus has been and will continue to be helpful in expanding our database of research-demonstrated outcomes of TT—a process that has stimulated the introduction of TT into many nursing schools and hospitals nationally and internationally. Yet these research studies are not wholly consistent with our conceptual framework. We have conducted our research studies from particulate–deterministic and interactive–integrative perspectives, yet TT is clearly an example of a phenomenon belonging to the unitary–transformative perspective.[21]

The purposes of this descriptive pilot study were to address this conceptual inconsistency and several other methodologic problems identified in earlier TT research,[15] while also providing direction for future TT studies by attempting to determine the appropriateness and suitability of a combination of psychologic and immunologic measures in the ongoing empiric evaluation of TT. The following understandings informed the decision-making process about which outcome variables to explore within this unitary context.

At the core of the TT process is the intent of the practitioner to help the recipient; that is, the practitioner attempts to focus completely on the well-being of the recipient in an act of unconditional love and compassion. For this reason TT has been called a "healing meditation."[10] Recent research suggests that positive emotions can have a beneficial effect on the health of the individual. McClelland[22] has demonstrated that feelings of compassion and unconditional love may increase the effectiveness of the immune system in the experiencer. If McClelland's hypothesis is correct, the practice of TT should be enhancing of or supportive to the practitioner's immune system. Anecdotally, TT practitioners claim that they are sick less often and that when they do become ill they consistently recover more quickly than others or themselves prior to becoming TT practitioners. Research on the practice of TT could thus reasonably ask about the effects of administering TT on the practitioners' immune systems. In seeking a population of recipients for such an investigation, recently bereaved individuals were chosen because they often have a temporarily suppressed immune system[23-25] in the absence of other

immunologic problems. These situational shifts might be expected to respond favorably to treatment by TT, which is assumed to accelerate natural healing processes. These considerations led to the framing of the following questions for study, explored using a descriptive study design.

RESEARCH QUESTIONS

1. Are these differences from baseline in the immunologic profile of recipients and practitioners immediately after and following a series of treatments with TT?
2. Are there patterns among or relationships between recipient's and practitioner's immunologic profile before, immediately after, and following a series of treatments with TT?
3. Are there differences from baseline in selected psychologic measures in recipients and practitioners immediately after and following a series of treatments with TT?
4. Are there patterns among or relationships between recipient's and practitioner's psychologic measures before, immediately after, and following a series of treatments with TT?
5. Are there patterns among or relationships between immunologic and psychologic measures in the recipients and practitioners immediately after and following a series of TT treatments?
6. Are there patterns among or relationships between the perceptions of effectiveness of treatments and psychoimmunologic outcomes of recipients and practitioners immediately after and following TT treatments?
7. Are there patterns among or relationships between the time experiences, perceptions of effectiveness, and psychoimmunologic outcomes of recipients and practitioners immediately after and following a series of TT treatments?

METHODOLOGY

Subjects

The subjects were two TT practitioners (SB and GA) and four recently bereaved individuals who received TT treatments (CB, VD, MG, and GS). Demographic data on the subjects appear in Table 1. The TT practitioners had been trained by Krieger and Kunz and had been practicing TT for over 5 years. TT practitioners were recruited through collegial contacts of the investigator. Two bereaved subjects were recruited through a newspaper ad, one responded to a request through a church bulletin, and one was referred by a colleague of the investigator. Bereaved individuals were told that we were interested in studying the potential benefits of TT for bereaved people like themselves. All subjects signed written informed consent, which included the instruction (also verbally given) that they may exit from the study at any time and for any reason.

Definition of terms and measures

TT is an intervention that is a derivative of laying-on of hands, during which it is assumed that the practitioner knowingly participates in the repatterning of the recipient's energy field for the purpose of helping or healing the person.[20] In treating a person with TT, the practitioner

Table 1. Demographic characteristics of the subjects

	TT recipients				TT practitioners	
Subject	**CB**	**VD**	**MG**	**GS**	**GA**	**SB**
Sex	F	M	M	F	F	F
Age (years)	61	47	72	62	46	57
Deceased relative	Husband	Mother	Wife	Husband	—	—
Length of bereavement	8 wks	24 wks	7 wks	15 wks	—	—
Religion	Pres*	RC*	RC*	RC*	RC*	Epis*
Occupation	Housewife	MD	Retired	Retired	RN, professor	Nurse
Highest grade	14	MD	GED*	AS*	EdD	AD*
Health problems	None	Gastritis; CAD*; hypercholesterolemia	Seizure disorder	Anxiety; depression; ASHD*	Obesity	Food allergies; Candida
Medication	Vitamins	None regularly	Dilantin	Persantine; Limbitrol	None	Nizoral; estrogen
Regular exercise	No	Runs	No	No	Walks	No
Meditation/ relaxation	No	No	No	No	Daily	Daily

*Pres=Presbyterian; RC=Roman Catholic; Epis=Episcopalian; GED=General Education Certificate; AS=Associate of Science Degree; AD = Associate Degree; CAD=coronary artery disease; ASHD=arteriosclerotic heart disease.

- makes the intention mentally to therapeutically assist the subject;
- moves the hands over the body of the subject from head to feet, attuning to the condition of the subject by becoming aware of changes in sensory cues in the hands;
- redirects areas of accumulated tension in the subject's energy field by movement of the hands; and
- focuses attention on the specific direction of energies to the subject using the hands as focal points.[11,12]

Psychologic measures

A psychologic profile was obtained on both recipients and practitioners. The profile included the following measures, among others: anxiety as measured by the State-Trait Anxiety Inventory (STAI)[26] and mood as measured by the Affect Balance Scale (ABS).[27] Reliability and validity of the STAI are well established, while there are no reliability and validity data available for the ABS.

Unitary measures

Included in this category are two experiential measures that might traditionally be considered within the psychologic dimension. Yet within a human energy field model, they may be better conceptualized as reflections of shifts in field pattern.

Effectiveness of treatment

Perception of the effectiveness of the treatment was measured by the Effectiveness of Therapeutic Touch [visual analogue] Scale (ETTS).[28] There is no established reliability or validity for this scale.

Time perception

Altered states of consciousness are known to be associated with distortions in time perception, and TT is assumed to involve an altered state of consciousness. Time perception was measured as a way of beginning to examine the nature of the change in consciousness that accompanies both the administration and receipt of TT and also to see if there might be any relationship between the time perception of the recipients and that of the practitioners as an index of their interconnectedness and mutual process.[21] Each recipient and practitioner was asked to write down, out of view of each other, an estimate of the length of time that had elapsed during the treatment that had just ended.

Immunologic measures and methods

A profile of immune functions was developed for each practitioner and recipient, consisting of the following four measures:

1. lymphocyte subset composition as determined by cytofluorographic analysis;
2. responsiveness toward foreign cells as shown by mixed lymphocyte reactivity (MLC) and cell-mediated toxicity (CML);
3. lymphocyte stimulation using phytohemagglutinin (PHA), concanavalin A (Con A), and pokeweed mitogen (PWM); and
4. natural killer cell (NK) assays.

Lymphocyte types were determined by utilizing commercially available fluorescence conjugated monoclonal antibodies, with cells being identified on a coulter cytofluorograph. Each sample was tested for percentage of T and B cells as well as for specific T4 (helper) and T8 (suppressor) T-cell subsets. This type of evaluation is becoming routine, and the percentages of these cells are becoming increasingly important for the delineation of immune potential.[29]

MLC and CML were obtained by utilizing standard radiolabeled assays with tritiated thymidine uptake indicating MSL reactivity and chromium release from target cells used to identify CML. These assays provide information on the ability of the subject's immune system to react to a foreign cell type. These functions represent a fundamental part of the immune response, with mixed lymphocyte responses being an indicator of recognition and cell-mediated lympholysis an indicator of the cytotoxic capability of sensitized lymphocytes.

Lymphocyte stimulations were performed using standard procedures for inducing lymphocyte division. These divisions were quantitated by the uptake of tritiated thymidine. The lymphocyte stimulation assay is a standard means to identify the reactivity of lymphocytes.[30] Mitogens such as PHA, Con A, and pokeweed have been used for many years to induce lymphocyte division. Most of the studies that seek to evaluate psychoneuroimmunologic changes have employed lymphocyte stimulation studies.[23-25]

NK assays were performed using a transformed cell line K562. Unlike the CML response, natural killing is a lymphocyte function that does not require the killer cells to be previously sensitized to their targets. It is

thought that the natural killing event is directed predominantly toward tumor cells. Radioactive assays to determine NK activity are routine.[31]

Testing procedures: Each blood sample was approximately 50 cc of heparinized blood and was divided into 2 aliquots. Whole blood was used for lymphocyte profiles, while the majority of the blood was fractionated over ficoll Hypaque gradients to purify the lymphocytes. Isolated lymphocytes were then split into two aliquots and frozen in liquid nitrogen until the time of testing. One of the frozen samples was used for CML and MLR. All of the samples were tested for CML and MLR on the same day to prevent interassay variability. The second aliquot of cells was used for the NK assays, again doing all testing on the same day to prevent variability.

Protocols

On day one all subjects completed baseline questionnaires and baseline bloods (B1) were drawn before TT treatments were administered. Repeat questionnaires were administered and repeat bloods (B2) were drawn on recipients following their first TT treatment. Questionnaires were administered and repeat bloods were drawn on practitioners after all of their treatments for that day were completed.

Treatment consisted of the practitioner administering TT in the manner in which it has been taught, that is, using the sequential steps as specified in the definition. Beyond this general guideline, the practitioners were permitted to administer TT as they usually did and for the length of time that they deemed appropriate. The length of time of the procedure was monitored by the research assistant. This is a shift from previous studies, critiqued by Quinn,[15] that have prescribed the exact length of treatment—a protocol that works well in the context of experimental design but which does not allow for study of the phenomenon as practiced clinically.

Final questionnaires were administered and final bloods were drawn pretreatment (B3) and posttreatment (B4) on the last day of participation for each subject. The trial was for 4 treatments for CB; 7 for VD, MG, and GS; 18 given by SB, and 14 given by GA. The numbers of treatments given reflects treatments given to an additional nonbereaved subject, for which data are not reported herein.

DATA ANALYSIS AND RESULTS

A research assistant administered and scored all psychologic tools and collected the time estimates after each session. Immunologic data was compiled and examined for clinical significance by the cellular immunologist (AS) on the project. The data were examined for patterns and trends using simple descriptive statistics. Only the most important findings will be summarized in the following discussion. A full report of this study is available from the first author.

Psychologic measures

Table 2 summarizes the changes that occurred in STAI, and Table 3 presents changes in ABS over the course of the study period in both recipients and practitioners.

State and trait anxiety

Recipients

State anxiety was measured before and after the first and the last TT treatments, pro-

Table 2. Percent changes from first to last measure on State-Trait Anxiety Inventory

	Recipients		Nurse	Recipients		Nurse
Measure	CB	VD	SB	MG	GS	GA
Pretest state anxiety	+56	−32	−38	−39	−14	+27
Mean percent change pretest to posttest state anxiety	−26	−32	−23	−34	−25	+8
Trait anxiety	+32	−21	0	−15	+19	−24

viding two change scores for each subject. These scores were averaged for each subject and are presented in Table 2. There was an average decrease in state anxiety, following treatment by TT, of 29% in recipients. This average percent change is considerably larger than that obtained in any of the TT studies to date, the largest percent change being 17% found by Quinn in 1984. Many possible explanations exist for this finding; however, it seems that a very likely one involves the method of administering the TT treatments. In former studies, these treatments have been operationally defined quite specifically, particularly in terms of length of treatment (5 minutes) and the use of touch or nontouch. The TT practitioners in these earlier studies were instructed to follow the protocols exactly. In this study, the TT protocol was not specified; that is, practitioners were permitted to administer the treatment as they determined and for as long

Table 3. Percent changes from first to last measure on Affect Balance Scale

	Recipients		Nurse	Recipients		Nurse
Measure	CB	VD	SB	MG	GS	GA
Joy	+38	+38	−9	+4	+38	+10
Contentment	+43	+47	0	+100	+11	+8
Vigor	+60	+56	0	+25	+18	+8
Affection	+79	+54	0	−7	+56	+6
Positive total	+67	+76	−9	+32	+42	+8
Anxiety	−33	−27	−25	−20	−18	−44
Depression	−25	−45	0	−33	−17	0
Guilt	0	−39	0	+64	−18	0
Hostility	+33	−43	−17	0	0	0
Negative total	−14	−43	−14	+3	−16	−23
Affect balance	+50	+152	−3	+29	+36	+8

as they determined. This may have contributed to the larger effect on state anxiety. There was a decrease in trait anxiety score from first to last TT treatments in two recipients and an increase in two recipients. No obvious explanation exists for this finding.

Practitioners

State and trait anxiety scores for practitioners both before and after administering TT were at or close to zero and so percent changes in their scores reflect very little real change. Their low anxiety may be a reflection of TT practice, meditation practice, or the unique setting of the study.

Patterns/relationships

Examination of these data does not reveal any obvious relationships between scores of recipients and scores of practitioners on state or trait anxiety. Further, there does not appear to be a pattern of response variability between the recipients treated by SB and those treated by GA.

Affect Balance Scale

Table 3 reveals that there was a dramatic increase in virtually all of the dimensions of positive affect (joy, vigor, contentment, and affection) and in the positive total in all TT recipients and a dramatic decrease in virtually all of the negative affect (anxiety, guilt, hostility, and depression) dimensions and the negative total in all TT recipients. The Affect Balance Index (relationship between positive and negative expressed in standardized score—the higher, the more positive) increased across all recipients. The pattern of results in the practitioners was similar to that of the recipients.

There are much larger increases in the positive total and much larger decreases in the negative total in SB's recipients than in GA's recipients. There is an average of 48% difference between the two groups in positive total, 77% in negative total, and 68% in Affect Balance Index.

Unitary measures

Effectiveness of Therapeutic Touch Scale

Following each TT treatment, both recipients and practitioners placed a mark on a visual analogue ETTS. These marks were scored as a number between 0 and 10, with 10 representing the maximum positive rating. Recipients treated by SB rated the effectiveness of their treatments 54% higher than did recipients treated by GA. Practitioners tended to rate their treatments similarly, although there was less variability in the ratings of SB. There was greater congruence between the ratings of SB and those of her recipients than between the ratings of GA and her recipients.

The congruence observed in SB and her recipient's ratings is quite interesting, well beyond the simple question of whether or not the treatment was perceived as helpful. There were many differences in outcomes between subjects treated by SB and those treated by GA. Perhaps the congruence we see in the effectiveness ratings is an index of the degree to which this practitioner was able to "get inside" of or "get into sync" with the recipients she was treating. Additional evidence that this may indeed by so appeared when examining the perception of time experience.

Time estimation

As noted earlier, this measure was included as an initial attempt to see if the shift

in consciousness that is assumed to occur during TT and that has also been observed in recipients of TT might in some way be reflected in a subject's experience of time. Each practitioner and recipient estimated the amount of time that had elapsed during treatment. The actual time elapsed was also recorded, and the difference between the two measures was labeled as "time distortion." A full presentation of this data appears elsewhere.[20] For the purpose of this article, a brief summary of this data will now be presented with emphasis on the relationship of these findings to the other measures in the study and on implications of the findings for future TT research.

Subjects treated by SB and those treated by GA again differed. SB's recipients experienced a distortion in time that was about three times that of the recipients treated by GA. Similar observations were made about the practitioners. SB experienced time distortion that was about four times greater than that experienced by GA. Actual length of treatment did not appear to relate to the amount of distortion on a case by case basis in either recipients or practitioners.

When examining how practitioner–recipient pairs experienced time, there was not any observable relationship in the *magnitude* of time distortion in these pairs–ie, in the actual number of minutes that were over- or underestimated. However, there was a very clear relationship in terms of the *direction* of time distortion. In all of SB's sessions, the direction of time distortion (ie, over- or underestimations) was the same for both her and her recipients, and this estimation varied each day with the same recipient. On some days they both overestimated, and on some they both underestimated. In GA's two recipients, there were two different patterns. With MG there was 100% congruence in direction of time distortion, and with GS there was 50% congruence. Interestingly, when SB treated GS, there was an inverse relationship in the direction of their time distortion as well. One possible explanatory note seems important here. GS, treated by GA, also had the least magnitude of time distortion, and her effectiveness ratings were also the lowest. It is possible that the ability of her system to shift into an altered state of consciousness, and thus to experience the time distortion, was influenced by her antidepressant medication. Further, it may be that the degree to which consciousness shifts in TT recipients influences how "effective" they perceive the intervention to be. Future study may shed light on this possibility.

There are many questions for future investigation raised by this set of findings. Are we seeing the emergence of an index of practitioner–recipient resonance? To date, no such index exists. If altered states of consciousness are correlates of alternative healing modalities, and if time perception/distortion is an index of consciousness, then perhaps we are. Can this index be used to determine if a given practitioner is able to enter the "healing state of consciousness?" Is this variable, time distortion, correlated with outcomes? The data in this study suggest such a possibility. Recall that we have seen what appears to be evidence of a connection, a resonance, between SB and her recipients, reflected in the congruence of their effectiveness scores and that, of the two recipients treated by GA, the more positively responsive one was in fact MG, with whom GA had 100% congruence on the distortion measure. Recall also that the two recipients treated by SB had the greatest posi-

tive changes in the ABS. Finally, we shall see that in some of the immunologic parameters the responses of SB's two subjects are again very similar.

Immunologic profile

Lymphocyte subset composition as determined by cytofluorographic analysis

Recipients

Table 4 presents the changes in lymphocyte subset populations from the first blood drawing to the last for all study participants. There are no consistent variations in subsets identified by the markers Leu-16, OKT11, OKT3, and OKT4 across recipients. However, examination of the OKT8 (suppressor T cell) subset presents a different pattern. Here there is a consistent change across all of the recipients, namely a diminution of the percentage of suppressor T cells. The percentage of OKT8 cells at B4 is lower in all four recipients, with a difference of over 20% in the case of CB. Such a change, particularly in light of the random pattern appearing in all other subsets, seems highly unlikely to be due to chance.

Practitioners

Table 5 reveals that SB has a disproportionately low percentage of T8 cells across all testing times, and very little fluctuation is seen between B1, B2, B3, and B4. GA began the study with a lower percentage of T8 cells than the recipients but a higher percentage than the other practitioner. Her pattern then resembled the initial drop in T8 cells seen in the recipients, such that her percentage of suppressor T cells became virtually identical with SB's percentage, with little fluctuation thereafter.

Patterns/relationships

It is particularly interesting to note the substantial difference between the recipients and the practitioners on the parameter of OKT8. As noted, both practitioners are lower in percentage of T8 cells than the recipients at the initial measurement. SB is 47% lower than the highest bereaved recipient (CB at 31.4) and 35% lower than the lowest bereaved recipient (VD at 25.4). These large differences between SB and the bereaved recipients continue throughout the study, even though the recipients experi-

Table 4. Lymphocyte profile percent change from B1 to B4*

Marker/ cell type	Recipients				Practitioners	
	CB	VD	MG	GS	SB	GA
Leu-16/B cells	+37	–26	–57	+11	+8	–29
OKT3/T cells	–5	–10	+15	+9	+2	+18
OKT11/T cells	–8	–9	+4	+0.3	–6	+8
OKT4a/helper T cells	–1	–0.2	+13	+9	+6	–5
OKT8/suppressor T cells	–21	–10	–20	–17	–16	–23

*B1 = initial baseline blood sample; B4 = terminal sample.

Table 5. OKT8—suppressor T cell subset percentage of total lymphocytes at B1 through B4*

	B1	B2	B3	B4
Recipients				
CB	31.4	30.8	26.4	24.7
VD	25.4	23.7	23.8	22.9
MG	30.3	26.6	21.9	24.1
GS	30.7	28.4	35.5	25.6
Practitioners				
SB	16.4	15.1	15.2	13.7
GA	22.0	16.4	15.3	17.0

*B1 = initial baseline blood sample; B4 = terminal sample.

ence a decrease in T8 percentages. GA begins the study 30% lower than CB and 13% lower than VD. She is 34% higher than SB. By the end of the first treatment (B2) however, she is virtually identical to SB and essentially remains that way throughout the rest of the study. It is interesting to note that SB is the more experienced of the two practitioners. She engages in TT practice on a daily basis and administers TT approximately 50 to 60 times per month. GA is an experienced practitioner who does not practice TT daily, administering an average of 10 TT treatments per month. While there is obviously no conclusive interpretation of this data that can appropriately be made, there are important questions raised for future study. For example, is there some relationship between frequent practice of TT and the findings related to the T8 population? Is a low percentage, a diminution, of suppressor T cells a marker in TT practitioners? Note that GA's percentage quickly came into line with SB's when she began treating people.

Summary

These data seem to indicate that something about the treatment (ie, the actual TT, the environment, etc) impacts on lymphocyte subset composition. The magnitude of the changes and the consistency of the pattern of diminution in T8 cells across both recipients and practitioners is unequivocal. Explanation of what this means, why this subset should respond differentially to TT, and what the impact of the response is in terms of the rest of the immune system and health status will have to wait for future investigations. One potential hypothesis deriving from this finding is that TT enhances immunologic functioning by the suppression of suppression, which, immunologically, is the equivalent of increasing helping.

Lymphocyte stimulation using PHA, Con A, and PWM

Recipients

Several patterns may be observed in these data, presented in Table 6. First, there are clear and substantial changes in the values across testings in all recipients, particularly in Con A and PHA. The percent changes from B1 to B4 clearly identify the magnitude of the change. Second, the direction of the change is not consistent across recipi-

Table 6. Percent change from B1 to B4* in lymphocyte response to mitogen stimulation

	Recipients				Practitioners	
Mitogen	CB	VD	MG	GS	SB	GA
Con A*	−19	−71	+140	+105	+17	—
PHA*	+5	−38	+59	+218	−50	−97
PWM*	−41	−61	+82	+596	+10	—

*B1 = initial baseline blood sample; B4 = terminal sample; Con A = Concanavalin A; PHA = phytohemagglutinin; PWM = pokeweed mitogen.

ents. Both CB and VD have a diminution of response to the mitogens from B1 to B4, while MG and GS have very large increases.

Practitioners

We have an incomplete dataset here due to an inadequate number of cells at several of the testings. The data that are available reveal several patterns. First, both SB and GA demonstrate a dramatic decrease in lymphocyte response to mitogen stimulation by PHA. SB's response to Con A is increased by B4 while response to PWM is small and unlikely to be significant.

Patterns/relationships

There are unequivocal changes in both the recipients' and the practitioners' lymphocyte response to mitogen stimulation. In addition, there are patterns of response across testings that are easily identified and are shared by SB's recipients CB and VD, who have been similar on many measures thus far. Why this should be and what this means in terms of TT and health, remain to be determined through further study.

MLC, CML, and NK assays

Inadequate numbers of cells were available for analysis of MLC and CML in practitioner GA. In SB and in recipients, there was a pattern of response that indicated an adequate recognition response (to foreign cell types) and a diminution of killing response. There does not appear to be any consistent effect of the TT treatment on NK in either recipients or practitioners. As noted, these findings are discussed in detail in the full report.

SUMMARY

A major focus for this pilot study was the relationship between the practitioner and the recipient of TT. Specifically, it was postulated that, since the nature of the TT interaction is unitary, it would be meaningful to study both sides of that relationship rather than one in isolation. The findings of this pilot study provide affirmation of that perspective. Some of the most interesting and theoretically significant findings of the study involve the comparison of practitioner and recipient data. In summary, it is clear that several changes occurred in both practitioners and recipients following the series of treatments with TT. There is no way to know which one or combination of factors discussed best explains the results; and there

are many possible intervening variables, all of which will need to be explored in further study. This pilot has served to demonstrate that further study of the effects of TT on immune systems of both practitioners and recipients is appropriate and that future studies should concentrate on the lymphocyte response to mitogenic stimulation, the modulation of subsets as a result of treatment, and perhaps most importantly, the immunologic differences between practitioners and nonpractitioners. Further, an entirely new area of study has emerged relative to the time experience of both practitioners and recipients of TT, which has theoretical implications beyond those concerned with TT.

DIRECTIONS FOR FUTURE RESEARCH

The following are recommendations for future research on TT within a unitary framework based on this pilot study.

This study should be replicated with larger samples of both practitioners and recipients. However, the design should allow for a longitudinal approach rather than the 2-week time frame we used. The recruitment of the bereaved population is not without difficulty; and to get an adequate sample, the study will need to go on over time with flexible entry and exit points for the bereaved subjects.

The design for the above replication should remain descriptive. This approach will allow the development of a much needed baseline of data that demonstrates the "best case" possibilities for this treatment prior to development of controlled intervention trials. However, even in controlled investigations, the TT treatment itself should not be manipulated. A control group of some sort could be added, but the TT treatment practitioners should be permitted to do the treatments as they determine.

Time estimation seems to have great descriptive and predictive potential in our attempts to understand healing and the practitioner–recipient mutual process. This variable should be measured in a more precise way. Computerized measurement would be ideal.

The ideal study would include computerized videotaping of the treatments with analysis of the videotapes for time, amount of physical contact, body closeness, the position of the eyes (ie, open or closed) the amount of movement of both practitioners and recipients, etc. Methodologies for such analysis exist and are used in anthropologic and sociologic studies.

A descriptive psychoimmunologic study of TT practitioners should be done. This could be done simultaneously with a study of TT treatments (ie, with recipients), or it could be done in its own right. The goal would be to determine whether the pattern in the suppressor T cell subset and the poor mitogen stimulation responses that we observed are uniform in TT practitioners or were unique to SB and GA. The methodology for such a study would be fairly straightforward using a descriptive correlational design and both TT practitioners and matched controls. Information about experience with TT, frequency of meditation, retrospective and prospective information on frequency of illness, and other psychophysiologic data could be collected and the results correlated with the immune profiles.

REFERENCES

1. Grad B, Cadoret RJ, Paul GI. An unorthodox method of wound healing in mice. *Int J Parapsychol.* 1961; 3:5–24.
2. Grad B. Some biological effects of the laying-on of hands: review of experiments with animals and plants. *J Am Soc Psychical Res.* 1965;59:95–127.
3. Grad B. A telekinetic effect on plant growth. *Int J Parapsychol.* 1963;5:117–133.
4. Grad B. A telekinetic effect on plant growth, II. *Int J Parapsychol.* 1964;6:473–485.
5. Smith MJ. Paranormal effects on enzyme activity. *Human Dimens.* 1972;1:12–15.
6. Krieger D. The response of in-vivo human hemoglobin to an active healing therapy by direct laying-on of hands. *Human Dimens.* 1972;1:12–15.
7. Krieger D. Healing by the laying-on of hands as a facilitator of bioenergetic change: the response of in-vivo human hemoglobin. *Psychoenergetic Systems.* 1974;1:121–129.
8. Krieger D. The relationship of touch, with the intent to help or heal, to subjects' in-vivo hemoglobin values: a study in personalized interaction. In: *Proceedings of the Ninth American Nurses' Association Research Conference.* New York, NY: American Nurses' Association; 1973.
9. Krieger D. Therapeutic Touch: the imprimatur of nursing. *Am J Nurs.* 1975;5:784–787.
10. Krieger D, Peper E, Ancoli S. Physiologic indices of therapeutic touch. *Am J Nurs.* 1979;4:660–662.
11. Heidt P. Effect of therapeutic touch on anxiety level of hospitalized patients. *Nurs Res.* 1981;30:32–37.
12. Quinn JF. Therapeutic touch as energy exchange: testing the theory. *ANS.* 1984;6:42–49.
13. Keller E, Bzdek VM. Effects of therapeutic touch on tension headache pain. *Nurs Res.* 1986;35(2):101–106.
14. Meehan TC. The effect of therapeutic touch on the experience of acute pain in postoperative patients. *Dissertation Abs Int.* 46, 795B. (University Microfilms No. 8510765), 1985.
15. Quinn JF. Therapeutic touch as energy exchange: replication and extension. *Nurs Sci Q.* 1989;2(2):79–87.
16. Kramer NA. Comparison of therapeutic touch and casual touch in stress reduction of hospitalized children. *Pediatr Nurs.* 1990;16(5):483–485.
17. Wirth D. The effects of non-contact Therapeutic Touch on the healing rate of full thickness dermal wounds. *Subtle Energies.* 1990;1(1):1–20.
18. Rogers ME. Nursing: science of unitary, irreducible, human beings: update 1990. In: Barrett EAM, ed. *Visions of Rogers' Science-Based Nursing.* New York, NY: National League for Nursing; 1990.
19. Cowling RW. A template for unitary pattern-based nursing practice. In: Barrett EAM, ed. *Visions of Rogers' Science-Based Nursing.* New York, NY: National League for Nursing; 1990.
20. Quinn JF. Holding sacred space: the nurse as healing environment. *Holistic Nurs Prac.* 1992;6(4):26–35.
21. Newman M, Sime AM, Corcoran-Perry SA. The focus of the discipline of nursing. *ANS.* 1991;14(1):1–6.
22. Borysenko J. Healing motives: an interview with David C. McClelland. *Advances.* 1985;2(2):29–41.
23. Clayton PJ. The sequelae and nonsequelae of conjugal bereavement. *Am J Psychiatry.* 1979;136:1530–1534.
24. Bartrop R, Luckhurst E, Lazarus L, Kiloh LG, Penny R. Depressed lymphocyte function after bereavement. *Lancet.* 1977;1:834–836.
25. Schleifer SJ, Keller SE, Camerino M, et al. Suppression of lymphocyte stimulation following bereavement. *JAMA.* 1983;250(3):374–377.
26. Spielberger CD, Gorsuch RL, Lushene RE. *STAI Manual for the State-Trait Inventory.* Palo Alto, Calif: Consulting Psychologists Press, Inc.; 1983.
27. Derogatis LR. *The Affect Balance Scale.* Baltimore, Md: Clinical Psychometrics Research; 1975.
28. Ferguson C. *Subjective Experience of Therapeutic Touch—Psychometric Examination of an Instrument.* Austin, Tex: University of Texas at Austin; 1986. Dissertation.
29. Georgi J. Lymphocyte subset measurements: significance in clinical medicine. In: Rose NR, Friedman H, Fahey JL, eds. *Manual of Clinical Laboratory Immunology.* Washington, DC: American Society for Microbiology; 1986.
30. Maluish A, Strong D. Lymphocyte proliferation. In: Rose NR, Friedman H, Fahey JL, eds. *Manual of Clinical Laboratory Immunology.* Washington, DC: American Society for Microbiology; 1986.
31. Herberman R, Ortaldo J. Natural killer cells: their role in defenses against disease. In: Rose NR, Friedman H, Fahey JL, eds. *Manual of Clinical Laboratory Immunology.* Washington, DC: American Society for Microbiology; 1986.