

: , . ,

1)

\* . \*\* . \*\* . \*\*\* . \*\*\* . \*\*\*

(Park & Suh, 1996; Lee, S. Y. et al., 2001).

1.

가 가

가

(Baldree, Murphy & Power, 1982; Lee et al., 2001), 가

(Mitzel- Wilkinson, 2000;

(psychoneuroimmunology)

Snyder & Lindquist, 1998).

(Caudell, 1996), Eisenberg(1998)

(AHNA) 1994

가 가

(Lim et al, 2000 )

(Lim et al.,

2000).

97

가 54.1 ,

(Chia, 1996; Mitzel-Wilkinson, 2000).

가 53.1

77

Snyder Lindquist(1998)

20-30%

가

가 (Baik, 1999; Kim, 2000)

1) 2001

\*

\*\*

\*\*\*

2002 3 27

2002 6 20

2002 8 12

). Lee(1992) Vigor Shin Oh(2001)가

2. 가

4.

가

가 1) 가

가 1 :

가

1.

가 2 :

가

가

가 2)

가 3)

al., 2001). , ' ' , 5%

가

3.

(Baldree et al, 1982).

1).

가

(Carter & Weber, 2000). Carter Weber(2000) reflexology Chia(1995) Chi-massage Oh(2001)가

가 (Daichou, Kurashige, Hashumoto & Suzuki, 1999; Lee et al., 2001).

가

T 가

가 polyamine

B

C3 가

(interactive guided imagery)

(Cordova, Benabe & Martinez-Maldonado, 1991).

B T 가 , T

가가 lymphokine

2).

가 T (Daichou et al., 1999; Raskova, Ghbrial, Shea, Elsinger & Raska, 1984).

) , , ,

(Lee, 1991), Shin(1996)

가

(Oh, 2001

가

(Park & Suh, 1995).

(Carter et al., 2000).

가  
(Shike, 1996).

DNA ,  
CD4, T

(Chia, 1996).

가

(Applebaum, 1992).

(Byers, 1984).

가

93.6%

6 - 9 5- 7

가 , 45.7% 가  
(Yang, Kwon & Kim, 2001).

(caterpillar technique)

1- 2

Tonini (1998)

가 10 9

가

-2

-a

가

가

(Carter et al, 2000).

가

가 T

(Kiecolt et al., 1985; O'Leary, 1990).

가

1.

3.

<Figure. 1>.

(reflexology)

10 가 가

가

calcium acid가

가 (Carter et al, 2000).

Head' zone massage

Fitzgerald(1913)가 (hand

zone therapy)

Ingham(1957)

foot reflexology

(Byers, 1984

).

가,

3

가

	before	intervention	after
Experimental G	Ye 1	X	Ye 2
Control G	Yc 1	-----	Yc 2

Y : Data collection

X : Experimental intervention

<Figure 1> Research design

2.

32 , 30 1 XE2100 .  
 7 31 ,  
 23 54 가 .  
 3. 가 가  
 2.7Kg 7 14 30gm (6 ) Lee(1991)  
 (Carter et al., 2000), 가 Cronbach's alpha .94  
 10 1- 2.2Kg 가 .70 , (8 ) Oh(2001)  
 ( ) - alpha .95 Cronbach's .93 .  
 , , 가 , T , B , NK ,  
 T , T , h/s ratio  
 (IGI) CD4, CD8, CD16, CD19 MCD( CD31,  
 3 CD32, CD33, CD34 )  
 (Snyder et al., 1998; Lee, 2000), Becton Dickinson ( )  
 mitogen 가 3 T3, T4, T8, T16, T19, T59  
 (Kwon et al., 1998). Park (1996) Flow cytometry .  
 Oh(2001) 5 5 ,  
 3 5 . 5.  
 Oh(2001)가 가 SPSS/PC 10.0  
 10 4 . 0.05 ,  
 2001 7 10 10 20 x<sup>2</sup>-test, t- test  
 9 , . 가  
 가 11 -12 . , t-test, paired t-test .  
 , .  
 5 1.  
 2 가 29 (53.7%) 가 25 (46.3%) ,  
 가 28 (51.9%), 가 26 (48.1%) .  
 49 (90.8%) , 35  
 (64.8%) . 43  
 1) : (77.8%) 가 , .  
 20 72  
 Braun ( ) Thermoscan IRT 1020 53.3 , 50.4 51.9±13.3  
 , Omron F2( ) . 2 22 4.5  
 , 3.8 4.2±5.7 ,

2) : Lee(1991) Oh(2001)가  
 0-10  
 가 가  
 (6 ) Lee(1991)  
 Cronbach's alpha .94  
 .70 , (8 ) Oh(2001)  
 Cronbach's  
 alpha .95 .93 .  
 3) : T , B , NK ,  
 T , T , h/s ratio  
 CD4, CD8, CD16, CD19 MCD( CD31,  
 CD32, CD33, CD34 )  
 Becton Dickinson ( )  
 T3, T4, T8, T16, T19, T59  
 Flow cytometry .  
 5.  
 SPSS/PC 10.0  
 0.05 ,  
 x<sup>2</sup>-test, t- test  
 . 가  
 t-test, paired t-test .  
 .  
 1.  
 가  
 29 (53.7%) 가 25 (46.3%) ,  
 가 28 (51.9%), 가 26 (48.1%) .  
 49 (90.8%) , 35  
 (64.8%) . 43  
 1) : (77.8%) 가 , .  
 20 72  
 Braun ( ) Thermoscan IRT 1020 53.3 , 50.4 51.9±13.3  
 , Omron F2( ) . 2 22 4.5  
 , 3.8 4.2±5.7 ,

<Table 1> Homogeneity test(  $\chi^2$ -test) for characteristics between experimental and control group (N= 54)

Subject		N (%)	Experi. G.	Control G.	$\chi^2$	P
Patient	CRF	29( 53.7)	16	13	.128	.79
	Ca	25( 46.3)	15	10		
Gender	male	28( 51.9)	17	1	.260	.78
	female	26( 48.1)	14	12		
Age	under 50	21( 38.9)	11	10	.355	.58
	above 51	33( 61.1)	20	13		
Religion	protestant	17( 31.5)	8	9	.034	.57
	catholic	5( 9.3)	3	2		
	buddhism	21( 38.9)	14	7		
	none	10( 18.5)	6	4		
Marital status	others	1( 1.8)	0	1	3.209	.20
	unmarried	5( 9.3)	1	4		
	married	42( 77.8)	26	16		
Address	others	7( 13.0)	4	3	1.763	.15
	city	32( 59.3)	16	16		
Care giver	country	22( 40.7)	15	7	.980	.61
	spouse	35( 64.8)	21	14		
Job	family	13( 15.1)	6	7	.589	.31
	others	6( 11.1)	4	2		
	none	32( 59.3)	17	15		
Economic status	yes	22( 40.7)	14	8	6.183	.74
	high	4( 7.4)	4	0		
	middle	46( 85.2)	23	23		
Education	lower	4( 7.4)	4	0	5.266	.15
	none	5( 9.3)	3	2		
	elemental	7( 13.0)	6	1		
	middle-high	22( 40.7)	9	13		
Total	over college	20( 37.0)	13	7	31(100.0 )	23(100.0 )
		54(100.0)				

1 9 1.7 ±2.4 , (p= .000), -19.0±17.37mmHg  
 1 5 1.1±1.32 (p= .000).  
 . x -12.0±13.34 mmHg  
 $\chi^2$ -test 가 .  
 <Table 1>. 5 .  
 -0.20±0.37°C  
 2. 가 0.09±0.33°C  
 (p= .005), ,  
 1) 가 1 : “ <Table 2>.  
 ” 가 가 2 : “  
 가 1 2 . 가 ” 가 <Table 3>  
 가 1 : “ .28±.64mg/ dl ,  
 가 ” 가 ,  
 - .30±.78mg/ dl  
 (p= .004). 가 1 .  
 -0.14±0.27°C 0.04±0.29°C  
 (p= .03). 2) 가 2 : “ 가  
 -5.2±4.87 / ” 가 <Table 3> .

<Table 2> Change of vital signs after 1st and 5th intervention

	exp (n = 31)	Difference after # 1st Int.		t	p	Difference after # 5th Int.		t	p
		con (n = 23)	Mean (SD)			Mean (SD)			
BT (°C)	Exp		-.14 ± .27	-2.32	.03		-.20 ± .37	-2.90	.005
	Control		.04 ± .29			.09 ± .33			
PR (n/min)	Exp		-5.19 ± 4.87	-4.96	.000		-6.90 ± 8.34	-1.34	.19
	Control		-1.61 ± 5.13			-2.74 ± 14.43			
Sys. P (mmHg)	Exp		-19.0 ± 17.37	-3.80	.000		-6.42 ± 15.06	-1.71	.09
	Control		.87 ± 21.03			1.91 ± 20.85			
Dia. P (mmHg)	Exp		-12.0 ± 13.34	-1.72	.09		-2.90 ± 11.31	-1.08	.09
	Control		-4.57 ± 18.4			2.65 ± 35.42			

<Table 3> Comparison of Hb and emotional responses before and after interventions

	exp (n = 31)	before	after	t	p	Difference (aft-before)		t	p
						con (n = 23)	Mean (SD)		
Hb (mg/dl)	Exp	10.10 ± 1.62	10.39 ± 1.78	2.48	.02		.28 ± .64	3.05	.004
	Control	10.29 ± 2.04	9.98 ± 1.87	-1.87	.07		-.30 ± .78		
vigor (score)	Exp	31.5 ± 15.3	37.0 ± 13.5	2.39	.02		5.53 ± 12.48	2.39	.02
	Control	32.5 ± 10.9	31.0 ± 10.9	-.98	.34		-1.52 ± 7.51		
mood (score)	Exp	40.5 ± 14.8	54.0 ± 17.0	6.79	.000		13.52 ± 11.08	5.92	.000
	Control	45.9 ± 15.9	41.4 ± 14.8	-1.95	.06		-4.48 ± 10.99		

t = paired t-test, t = independent t-test

(p = .02) , 5.53 ± 12.48 (.000) 가 2가 .

<Table 4> Analysis of the immune cells before and after intervention

	exp (n = 31)	before	after	t	p	difference (aft-before)		t	p
						con (n = 23)	Mean (SD)		
Lymp (%)	Exp	22.58 ± 10.89	17.21 ± 9.20	-2.71	.01		-5.37 ± 11.02	-.18	.86
	Control	24.80 ± 15.46	18.92 ± 12.27	-2.96	.007		-5.88 ± 9.53		
T cell (%)	Exp	68.32 ± 11.23	65.79 ± 14.23	-1.31	.20		-2.53 ± 10.77	-1.03	.31
	Control	73.19 ± 12.51	73.14 ± 11.50	-.03	.98		-.04 ± 6.87		
B cell (%)	Exp	11.50 ± 7.18	16.19 ± 11.52	2.94	.006		4.69 ± 8.89	2.92	.006
	Control	7.35 ± 5.44	7.07 ± 3.41	-.48	.64		-.28 ± 2.83		
NK cell (%)	Exp	20.17 ± 7.99	17.71 ± 9.26	-1.62	.12		-2.47 ± 8.50	-1.30	.20
	Control	19.48 ± 10.60	19.80 ± 9.69	.23	.81		.33 ± 6.74		
h/s ratio	Exp	1.45 ± .71	1.53 ± .72	.76	.46		.07 ± .55	.44	.66
	Control	1.20 ± .62	1.23 ± .61	.33	.75		.02 ± .32		
T cell (n/mm <sup>3</sup> )	Exp	894.8 ± 575.3	751.7 ± 432.7	-1.67	.11		-143.1 ± 476.7	-.78	.44
	Control	906.7 ± 413.9	856.1 ± 486.7	-.66	.51		-50.6 ± 366.2		
Th (n/mm <sup>3</sup> )	Exp	504.5 ± 322.2	448.7 ± 285.2	-.97	.34		-55.8 ± 321.9	-.32	.75
	Control	483.2 ± 269.9	451.6 ± 295.9	-.75	.46		-31.6 ± 201.2		
Ts (n/mm <sup>3</sup> )	Exp	397.7 ± 309.0	310.9 ± 191.4	-2.23	.03		-86.74 ± 216.9	-1.24	.22
	Control	442.7 ± 213.0	426.9 ± 262.5	-.38	.70		-15.70 ± 197.5		
B cell (n/mm <sup>3</sup> )	Exp	139.8 ± 100.2	186.0 ± 156.8	2.11	.04		46.23 ± 122.3	2.45	.02
	Control	84.5 ± 68.15	74.9 ± 70.0	-1.55	.14		-9.61 ± 293.75		
NK cell (n/mm <sup>3</sup> )	Exp	252.4 ± 141.2	188.4 ± 142.5	-2.40	.02		-64.03 ± 148.7	-1.02	.31
	Control	238.8 ± 157.3	214.3 ± 125.9	-.92	.37		-24.57 ± 127.8		

t = paired t-test, t = independent t-test, Th; helper T cell, Ts; suppressor T cell

3) 가 3. : “ 가 <Table 4> <Table Lee(2000) 20 3 가 5> 가 가 T , 가 , NK B (4.69±8.89%) (46.23±122.3/mm<sup>3</sup>) 가 (p= .006, p= .02). (CD) (Oh, 2001, Snyder et al., 1998). (1998) (2000)가 CD19 (4.94±8.91/μℓ)가 (p= .008), CD8 CD16 (Oh, 2001 ), Oh(2000) <Table 5>. 가 3 4 , Park (1995) 5 가 1. 가 (Park & Suh, 10 1995), Oh(2000) 5 가 5 (Oh, 2001). (Birk et al., 2000; Lee, 2000). Susan(1998) 10 1 가 (Choe, Oh D. & Oh S., 2000). (Baik, 1999) (TT) 가 , ), Baik(1999) (Randolph, 1984), Choe (2000) ,

<Table 5> Analysis of CD before and after intervention

n/ μℓ	exp (n=31) con (n=23)	before		after		t	p	difference (aft-before)	
		Mean (SD)	Mean (SD)	t	p			Mean (SD)	t
CD4	Exp	37.3 ± 9.0	37.6 ±11.9	.14	.89	.32 ±12.69	.27	.79	
	Control	36.4 ±11.5	36.0 ±12.6	-.29	.77	-.39 ± 6.42			
CD8	Exp	29.1 ±10.2	28.1 ± 9.0	-1.13	.27	-1.03 ± 5.09	-.72	.48	
	Control	34.3 ±10.5	34.2 ±11.1	-.10	.92	-.09 ± 4.31			
CD16	Exp	19.2 ± 7.3	17.5 ± 9.2	-1.12	.27	-1.68 ± 8.35	-1.19	.24	
	Control	18.8 ±10.8	19.6 ±10.3	.61	.55	.83 ± 6.54			
CD19	Exp	11.7 ± 7.0	16.0 ±11.4	3.09	.004	4.94 ± 8.91	2.79	.008	
	Control	7.1 ± 5.5	7.2 ± 5.8	.13	.90	.09 ± 3.23			
MCD	Exp	65.69±12.14	64.54±14.62	-.56	.58	-1.15 ±11.47	-.15	.88	
	Control	69.04±11.23	68.27±10.75	-.57	.58	-.77 ± 6.55			

t = paired t-test, t = independent t-test, MCD= Mean of CD31, CD32, CD33, CD34

가 (Kim, 2000) myeloid , CD34 (Kwon et al, 1998),

TT Hb (Randolph, 1884) B CD19 가

Hb CD4 h/s , CD8 (Shike, 1996; Yang, 2001) NK

(Lee et al., 2001)

가

2.

가 (Byers, 1984; Carter et al., 2000). 2001 7 10

3 54

가 (Caudell, 1996; Snyder et al., 1998). ( 31 , 23 ) Carter reflexology Chia

NK (Kiecolt et al., 1985; O'Leary, 1990). 5 Chi-massage (2001) 10 3

NK Yang(2000) 40

가 CD4 CD8 NK SPSS/PC(10.0)

가 , CD8 NK Cronbach's alpha

가 가 CD4/CD8 (Yang, 2000). NK  $\chi^2$ -test t-test

CD8 가 T B (Daichu et al., 1999), independent t-test paired t-test

가 , B h/s 가 가 1. 1 5 (p= .03, p= .005),

B 1 (p= .000) 5

CD19 . Brewitt (1997) 가 가 2. (p= .004).

(Wardell, 2001 ), Ig A가 3. (p= .02)

Reiki touch 30 (Wardell, 2001) 4. (p= .000) 가

CD32, CD33 CD34 (MCD)가 B

가 (p = .02, p = .006), CD19  
(p = .008).  
T NK 가

가 . 가

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- Abstract -

### Effects of Hand Reflexology on Physiological · Emotional Responses and Immunity in the Patients with Chronic illness ; Chronic renal failure patients and Cancer patients

Lee, Chung-Hee \*. Oh, Sei-Young \*\*  
 Park, Ok-Soon \*\*. Kwon, In-Gak \*\*\*  
 Jeong, Mi-A \*\*\*. Lee, Eun-A \*\*\*

**Purpose:** The purpose of this study was to explore the effects of hand reflexology on the physiological · emotional responses and immunity of the patients with chronic illness. This study looked specifically at patients with chronic renal failure(CRF) and cancer patients.

**Method:** This study was designed as a quasi-experimental nonequivalent control group pre and post test. Subjects were 54 patients who received dialysis and chemotherapy in one hospital. Thirty-one patients were assigned to the experimental group and 23 to the control group. The hand reflexology was applied to both hands of the experiment group for ten

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minutes each time, 5 times during three days. For data collection, physiological lab levels, immune cells of blood and questionnaires for emotional responses were measured before and after the program.

Result: BT of the experiment group was decreased significantly on both of the 1st and the 5th application. PR & BP were decreased significantly on the 1st times, but not 5th times. Hb levels of the experimental group were significantly increased. And emotional responses, vigor and mood scores of the experiment group were significantly increased. B cell & CD19 were increased significantly on

the experiment group. Suppressor T cell and NK cell showed significant decrease after the program, but no significant differences between the groups.

Conclusion: We have found that the hand reflexology helps the chronic patients to improve physiological · emotional responses and the immune reaction. Through this result, the hand reflexology is effective as a intervention of psychoneuroimmunologic function.

Key words : Hand reflexology, Physiological · emotional responses, Immunity