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al, 1977), (Carmichael et al, 1988b), (Gilcrest et al, 1977), (, 1986; Duo, 1987), 가 (Dawborn et al, 1983)

1932 Chargin 65-80% Keil 가 (, 1988; Stähle-Bäckdahl, 1988, 1989; Deleixhe-Mauhin et al, 1993). 가 (Gilcrest et al, 1980, 1982; Yosipovitch et al, 1993; Ostlere et al, 1994)

(Aromatherapy) (essence oil) , 가 (, 1989; Stähle-Bäckdahl, 1988), (Matsumoto et al, 1985), A 가 (De Kroes & Smeenk, 1983; Berne et al, 1984), (mast cell) 가 (, 1991; Stockenhuber et al, 1990), (Blachely et al, 1985; Carmichael et al, 1988a)

(Pederson et al, 1980), cholestyramine (Silverberg et al, 1977), azelastin HCL (Matsui et al, 1994), (Yatzidis et al, 1972) , lidocaine (Tapia et al, 1977), (Carmichael et al, 1988b), (Gilcrest et al, 1977), (, 1986; Duo, 1987), 가 (Dawborn et al, 1983)

(Mckensie & Gallacher, 1989; Lawless, 1994; Price, 1994). Jean Valnet , (Hewitt, 1992 ; Buckle, 1993), 가 가 , , , (Atanassova-Shopova et al, 1973; Buchbauer, 1993a) . 200 가 가

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(Lavender: *Lavendula officinalis*) limonene,
pinene, geraniol, linalol ,
(Tea tree: *Melaleuca alternifolia*)
terpineol-4, cineol, cymene,
sesquiterpenes

(Blackwell, 1991).

25-30

가

(Lavabre,

1990).

가 가

가

4 , 2

4
(1).

1.

(ultraviolet

1998 3 20 6 13 가

B)

2 3 2 3

가

(Gilchrest et al, 1977),

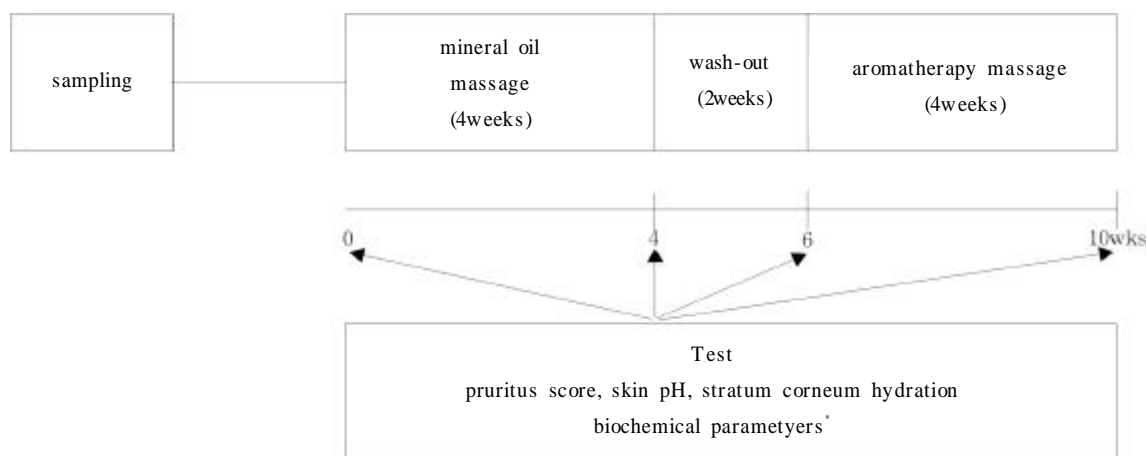
20

6

2

4

가 (



<Fig.1> Research procedure

, 1997)

3.

1)

가

(22°C, 40-60%)

pH meter corneometer pH

(stratum corneum hydration)

(BUN), (Cr),

(ALP), (P), (PTH), 3

4 (C₃, C₄)

pH,

2

2)

(1)

4 3 , 7 (Johnson

& Johnson)

가

3-5ml

(storking) (petrissage)

liquid

paraffin , pH/Ion meter (model 920, Orion, USA)

pH 6.2

(2)

2

가 4 (Lavender, Charabot ,

France) (Tea tree, Main Camp Co, Australia)

(carrier oil or base oil)

2%

100ml

1ml

pH/Ion meter pH 7.2

3)

4 2 3)

4.

1)

Duo (1987)

0 9 가

0 : 가

1 : 가

2 : 가

3 : 가 가

4 : 가

1 :

2 :

1 :

2 :

3 :

2)

(1) pH

pH meter (pH 900m, Courage and Khazaka

Electronic GmbH, Kohlen, Germany)

(Stähle-

Bäckdahl, 1989)

10cm

1

(2)

corneometer (Cm 820 pc, Courage and Khazaka

Electronic GmbH) pH

arbitrary

unit (AU)

pH

1

10ml

PTH (P=.0001),
 2 site immunoradiometric assay, C3 C4 single 5.14 ± 1.59 4.90 ± 1.55
 radial immunodiffusion
 BUN, Cr, ALP, P, Ca 가 (P=.0001) (1).
 2. pH,
 5. pH 5.16 ± 0.31
 SAS 5.20 ± 0.52 가
 , pH, 4.91 ± 0.73 5.29 ±
 0.28 가
 paired t-test (P=.044). pH
 가 (1).
 (Repeated measures ANOVA) , 가
 Bonferroni 76.40 ± 5.99 AU 85.38 ± 8.66 AU
 , pH, 가 (P=.0001), 78.11 ±
 6.57 AU 81.14 ± 7.57
 Pearson correlation coefficient
 (P=.0111) (1).
 3.
 1. Cr BUN
 Ca, PTH, ALP, P, C3, C4
 5.05 ±
 1.53 2.86 ± 1.77 2.19

Table 1. Comparison of pruritus score, skin pH and stratum corneum hydration of the two treatments.

	Before Tx (Mean ± SD)	After Tx (Mean ± SD)	t (P)	Difference (After- Before)	t (P)
Pruritus score					
Mineral. Tx.	5.14 ± 1.59	4.90 ± 1.55	1.23 (.2340)	-0.24	7.44 (.0001)
Aroma. Tx.	5.05 ± 1.53	2.86 ± 1.77	9.74 (.0001)	-2.19	
Skin pH					
Mineral. Tx.	4.91 ± 0.73	5.29 ± 0.28	2.15 (.0444)	0.38	1.69 (.1074)
Aroma. Tx.	5.16 ± 0.31	5.20 ± 0.52	0.45 (.6543)	0.05	
SCH (AU)					
Mineral. Tx.	78.11 ± 6.57	81.14 ± 7.57	1.63 (.1179)	3.03	2.80 (.0111)
Aroma Tx.	76.40 ± 5.99	85.38 ± 8.66	5.48 (.0001)	8.98	
Mineral Tx. : Mineral oil treatment Aroma Tx. : Aromatherapy treatment SCH : Stratum corneum hydration AU : arbitrary unit					

Table 2. Comparison of biochemical parameters between before the treatment and after the two treatments.

	Before Tx.	After Tx.		F value	P value
		Mineral.	Aroma.		
Cr(mg/dL)	8.33 ± 2.79	8.43 ± 2.92	8.28 ± 3.24	0.67	.5144
BUN(mg/dL)	66.27 ± 16.99	67.46 ± 21.89	57.93 ± 17.15	4.34	.0197
Ca(mg/dL)	9.09 ± 0.84	9.35 ± 0.80	10.01 ± 1.08	8.57	.0008
PTH-intact (pg/ml)	36.54 ± 56.31	48.55 ± 72.97	36.10 ± 59.96	3.31	.0468
ALP(U/L)	176.86 ± 65.66	187.24 ± 86.63	180.57 ± 59.12	0.39	.6777
P(mg/dL)	4.55 ± 2.17	4.46 ± 2.10	4.10 ± 1.85	0.64	.5308
C ₃ (mg/dL)	57.29 ± 13.58	54.52 ± 10.94	60.29 ± 12.42	2.13	.1318
C ₄ (mg/dL)	40.25 ± 12.40	41.43 ± 12.68	41.98 ± 12.82	0.46	.6373

* P<.05 by Bonferroni comparison

Mineral Tx : Mineral oil treatment

Aroma Tx : Aromatherapy treatment

, BUN (F=4.34, p=.0197), Ca (F=8.57, p=.0008), PTH (F=3.31, p=.0468)

BUN
66.27 ± 16.99 mg/dL 67.46 ± 21.89

mg/dL
57.93 ± 17.15 mg/dL

Ca
9.09 ± 0.84 mg/mL 9.35

± 0.80 mg/mL
10.01 ± 1.08 mg/mL

가 (P=.0105),
가 (P=.0276). PTH 36.54 ± 56.31

pg/ml 48.55 ±
72.97 pg/ml, 36.10 ± 59.96 pg/ml

(P=.0465) (2).

4.

pH가 , 1986).

(r=-.5734, Gilcrest (1982)
p=0.0066) (3). pH, 78%, (1989) 62%, Yosipovitch
(1993) 73%

Table 3. The correlations of pruritus score, skin pH and stratum comeum hydration on hemodialysis duration and age

	HD Duration	Age
Pruritus score	-.0865 (.7093)	.1091 (.6378)
Skin pH	-.3841 (.0856)	.0729 (.7534)
SCH	-.5734 (.0066)	-.0150 (.9487)

HD : hemodialysis

SCH : stratum corneum hydration

가
(Nilsen et al, 1988).

가 3 68 % . (lipophilic)
 21 17 (81%) (blood-brain barrier) 가
 7 (33%) (Buchbauer, 1993b).
 가 5
 Hesús가 pH 20 90
 Jolly (1961) pH (Jäger et al, 1992)
 pH 4-6.5
 . Braun-Falco Korting (1986)
 pH가 5.4-5.9 , Zlotogorski (1987)
 pH 4.0-5.5 pH
 4.7
 pH 4 6.5 Gilchrest (1980), Deleixhe-Mauhin (1993), Yosipovitch
 (1993)
 pH (pH 6.2) , Young (1973)
 pH 가 Stähle-Bäckdahl (1989) 가
 가 (1989),
 가 (Braun-Falco & Korting, (1993) 가
 1986), pH 가
 가 가
 , 가
 (transepidermal water loss),
 , corneometer
 (dielectric constant) 가 Young
 가 (1973) BUN, ALP, Ca,
 Mg ,
 Blachley (1985)
 (Blichmann & Serup, 1988).
 가
 가 . Stähle-Bäckdahl
 (1988)
 가 , Morton (1996)
 가 (1989)
 (limbic system) alkaline phosphatase가
 (Welsh, 1997), , Carmichael (1988)

De Kroes & Smeenk (1983),
 (1988), Stockenhuber (1990),
 (1991), Matsui (1994),
 A
 Matsumoto (1985)
 , De Filippi (1995)
 Cr BUN
 ALP, P, C3, C4
 Ca, PTH,
 Ca 가 PTH
 가
 (Tapia,
 1979), cholestyramine
 (Silverberg et al, 1971).

(Peña,
 1961; Opdyke, 1975; Rudzki et al, 1976).
 80%
 BUN, Cr

1. ,
 가
 2. ,
 가
 가 가
 3. , pH
 가
 pH 가
 4. ,
 가
 5. , pH
 가 pH,
 가
 가
 (1993).
 , 31, 90-
 895.
 , , (1988).
 , 26, 785- 790.
 , , , , (1989).
 , 32, 299- 306.
 , , , ,
 1998 3 20
 6 13 21 4
 3 2
 가 4 3
 (1986).
 , 24(2), 190- 194.
 , , , (1991).
 10(1),
 68- 74.

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- Abstract -

Key concept : Aromatherapy, Skin xerosis, Pruritus,
Hemodialysis

Effect of Aromatherapy on Skin Xerosis and Pruritus in Patients Undergoing Maintenance Hemodialysis

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This study was designed to investigate the effect of aromatherapy on skin xerosis and pruritus in patients undergoing maintenance hemodialysis. Twenty one subjects of this study were selected from St. Paul's Hospital in Seoul. All the subjects were received the mineral oil massage at the arm without fistular three times per week for 4 weeks. After 2 weeks period of wash-out, the subjects were received the aromatherapy of lavender and tea tree essence oil in the same way. This study was carried out from March 20 to June 13, 1998. Pruritus score, skin pH and stratum corneum hydration were measured before and after each treatment. But, biochemical parameters were measured before the treatment of the mineral oil massage, after the treatment of the mineral oil massage and the aromatherapy.

Data of this study were analyzed by paired t-test, repeated measures ANOVA, Bonferroni multiple comparisons and Pearson correlation coefficient. The results were as follows ;

1. Pruritus score was significantly decreased after the aromatherapy, while no significant change after the treatment of the mineral oil massage. Therefore, there was a significant difference in the pruritus score between the two treatments.
2. Stratum corneum hydration was significantly increased after the aromatherapy, while no significant change after the treatment of the mineral oil massage. Therefore, there was a significant difference in the stratum corneum hydration between the two treatments.
3. Skin pH was significantly increased after the treatment of the mineral oil massage, while no significant change after the aromatherapy. Therefore, there was no significant difference in the skin pH between the two treatments.
4. After the aromatherapy, the serum calcium was significantly increased. Whereas the serum parathyroid hormone intact was significantly decreased compared with the treatment of the mineral oil massage. But the level of the serum Ca and PTH-intact were within the normal range.
5. Stratum corneum hydration was decreased corresponding to the duration of hemodialysis, while pruritus score and skin pH showed no change corresponding to the duration of hemodialysis and the age of the subjects. The correlation of pruritus score on skin pH, stratum corneum hydration and biochemical parameters was not significant.

In conclusion, this findings indicate that aromatherapy may be effective in decreasing skin xerosis and pruritus score in uremic pruritus patients undergoing maintenance hemodialysis.

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