Evaluation of the degree of skin dryness and the effect of moisturizing therapy in scalp psoriasis

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Background

- Most of patients showed scalp involvement and it is one of the most challenging conditions in psoriasis
- Dryness of skin is well known aggravating factor of psoriasis

→ Strangely enough, mainstay of scalp psoriasis treatment has been focused only on suppression of inflammation without serious attempt to moisturize scalp skin

Objective

- To investigate the degree of skin dryness and the effect of emollients in scalp psoriasis for arousing the necessity of moisturizing therapy

Materials and Methods

- **Study design**

Case-control study

Approved by the institutional review board of the Korea University Guro Hospital

- **Patient population**

15 scalp psoriasis patients and 15 persons in control group

Exclusion criteria : Patients who had recent surgical treatment of scalp, other dermatologic disease that might affect scalp psoriasis, photosensitivity, et cetera

1) Scalp psoriasis patient group

15 persons (male 10, female 5)

Age : 22 - 71 years (mean : 47.2)

2) Control group

15 persons (male 9, female 6)

Age : 25 - 60 years (mean : 39.3)

Tinea pedis, urticaria, epidermal cyst, lipoma, acne vulgaris, scar, ingrowing nail, melasma, healthy volunteer

- **Evaluations of degree of skin dryness and effects of emollients**

Parameter : Capacitance, sebum content, and trans-epidermal water loss (TEWL)

Measuring site

1) Scalp psoriasis group : Lesional and normal-looking skin of temporal scalp and extremities (or trunk)

2) Control group : normal temporal scalp

Measuring time : Before and after two weeks of moisturizing therapy

Assessment : Electronic measurement by corneometer, sebumeter, and evaporimeter

Application of emollients : Suitable amount, twice-daily (day and night) during two weeks

- **Statistical analysis**

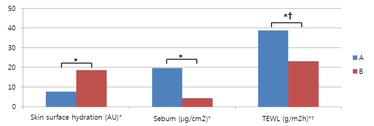
SPSS® version 20 : Mann-Whitney test, One sample Wilcoxon signed rank test, Wilcoxon signed rank test

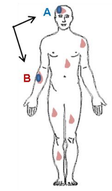
Results

Ⅰ. Scalp vs extremity (or trunk) lesion of psoriatic patients

Site		Skin surface hydration (AU)*	Sebum (μg/cm²)*	TEWL (g/m²h)*†
Scalp (A)	Mean	9.53	32.87	37.89
	Median	7.67	19.67	38.83
Extremity (or trunk) (B)	Mean	19.78	11.42	21.84
	Median	18.67	4.33	23.1

Mann-Whitney test* and one sample Wilcoxon signed rank test† was performed for statistical analysis. *p-value < 0.05, †p-value<0.05.



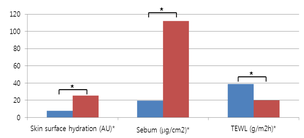


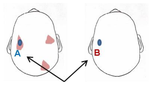
• Psoriatic scalp is far drier than psoriatic skin of the other parts of the body

Ⅱ. Lesional scalp skin of patients vs scalp skin of control group

Site		Skin surface hydration (AU)*	Sebum (μg/cm²)*	TEWL (g/m²h)*
Lesional scalp skin of patients (A)	Mean	9.53	32.87	37.89
	Median	7.67	19.67	38.83
Scalp skin of control group (B)	Mean	25.00	113.20	18.62
	Median	25.33	112	20.07

Mann-Whitney test was performed for statistical analysis. *p-value < 0.05.



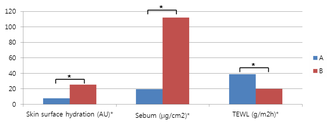


• Comparing with normal scalp skin, psoriatic lesions on scalp showed lower capacitance (38%), decreased sebum level (29%), and increased TEWL (203%)

Ⅲ. Lesional vs normal-looking scalp skin of patients

Site		Skin surface hydration (AU)*	Sebum (μg/cm²)*	TEWL (g/m²h)*
Lesional scalp skin (A)	Mean	9.53	32.87	37.89
	Median	7.67	19.67	38.83
Normal-looking scalp skin (B)	Mean	18.24	81.65	22.56
	Median	19	78.67	22.87

Mann-Whitney test was performed for statistical analysis. *p-value < 0.05.

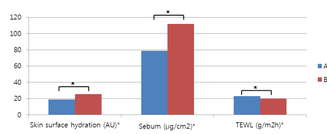


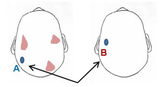
•The lesions of scalp showed lower capacitance (52%), decreased sebum (40%), higher TEWL (168%) than uninvolved scalp skin

Ⅳ. Normal-looking scalp skin of patients vs scalp skin of control group

Site		Skin surface hydration (AU)*	Sebum (μg/cm²)*	TEWL (g/m²h)*
Normal-looking scalp skin of patients (A)	Mean	18.24	81.65	22.56
	Median	19	78.67	22.87
Scalp skin of control group (B)	Mean	25.00	113.20	18.62
	Median	25.33	112	20.07

Mann-Whitney test was performed for statistical analysis.*p-value < 0.05.



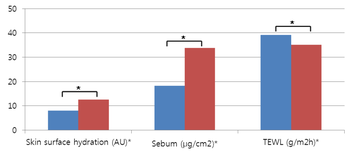


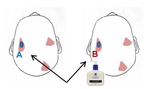
• Comparing with normal scalp, uninvolved (normal-looking) scalp skin of psoriatic patients revealed decreased capacitance (73%), decreased sebum level (72%), and increased TEWL (121%)
• Even in uninvolved area, scalp skin is suffered from lower degree of hydration

Ⅴ. Baseline vs after two weeks course of emollients application

Lesional scalp skin of patients		Skin surface hydration (AU)*	Sebum (μg/cm²)*	TEWL (g/m²h)*
Baseline (A)	Mean	9.76	33.41	38.87
	Median	8	18.17	39.2
After application (B)	Mean	12.95	44.76	31.86
	Median	12.5	33.83	35.15

Wilcoxon signed rank test was performed for statistical analysis. *p-value < 0.05.





• After 2 weeks of moisturizing therapy, significant improvement (33% increase of capacitance, 34% increase of sebum level, 18% decrease of TEWL) of impaired hydration status was noticed in lesions of scalp psoriasis patients

Discussion

- **Lesional scalp skin of psoriatic patients**

vs lesional extremity (or trunk) skin

Between-group tendency still maintain, but significantly higher TEWL

→ **Far drier than psoriatic skin of the other parts of the body**

vs Scalp skin of control group

Poor hydration status and barrier function in involved psoriatic epidermis compared with the uninvolved skin

Sebaceous glands were extremely reduced in scalp psoriasis

→ **Scalp skin of psoriasis patients is suffered from dryness that well known aggravating factor of psoriasis**

- **Normal-looking scalp of psoriatic patients**

vs Scalp of control group

The normal-appearing skin of psoriatic patients has long been known to manifest subclinical morphologic and biochemical changes, particularly involving lipid biosynthesis

The intensity of these changes may depend on distance from an established lesion

Atopic lesion showed higher than normal TEWL values in atopic dermatitis subjects, not only with dry-looking skin but also with normal-looking skin

→ **Even in uninvolved area, scalp skin is suffered from lower degree of hydration**

- **Before vs after two weeks of moisturizing therapy**

Moisturizing cream ameliorates dryness and desquamation in psoriasis patients and strengthens of a weakened skin barrier function through improving stratum corneum hydration and restoring integrity of stratum corneum of lesion

→ **Moisturizing therapy restore damaged psoriatic scalp skin, these results may indicate the importance of moisturizer as a component in psoriasis management**

Conclusion

- **Psoriatic scalp is far drier than psoriatic skin of the other parts of the body**
- **Even in uninvolved area, scalp skin of psoriatic patients is suffered from lower degree of hydration**
- **Complementary moisturizing therapy for whole scalp including uninvolved skin restore impaired skin barrier functions**
- **Moisturizing therapy is mandatory to managing scalp psoriasis and to prevent further aggravation by untoward influence of topical steroid**

Selected Reference

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Conflicts of Interest

In relation to this presentation,
I declare that there are no conflicts of interest.