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## SERUM AND TISSUE ANGIOTENSIN CONVERTING ENZYME IN PATIENTS WITH ALOPECIA AREATA

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### Introduction:

Alopecia areata (AA) is an immune dependent disorder characterized by T-lymphocytes interaction with follicular antigens. Recent studies have shown the existence of local renin-angiotensin system (RAS) in the skin. In this system angiotensin converting enzyme (ACE) plays a role in autoimmunity and inflammation. The objective of this study was to evaluate serum and tissue ACE activity in patients with AA.

### Material/methods:

This case control study was conducted on patients with AA and healthy controls. Control group consisted of persons who were candidate for excision of their scalp pilar cyst. Normal skin over the cyst was used as control for tissue ACE activity. Serum ACE activity was assessed based on the furylacryloyl phenylalanyl (FAP) method and tissue ACE activity was assessed using immunohistochemistry.

### Results:

Twenty five patients with AA (60% male, 40% female, mean age 32.08±9.9 years) and 24 healthy persons with pilar cyst (50% male, 50% female, mean age 37.38±8.8 years) were included in the study. The average of serum ACE activity was 52.12 ± 9 U/L in cases and 55.25 ± 14.7 U/L in controls (P = 0.37). Tissue ACE activity was significantly lower in cases in all parts of the skin including epidermis (P=0.016), follicular epithelium (P=0.004), and endothelium (P=0.037). There was no significant difference in tissue distribution of ACE between two groups.

### Conclusions:

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In this study we showed that in spite of some other inflammatory diseases, tissue level of ACE is significantly lower in AA comparing to normal controls. We could not show RAS role in the pathogenesis of AA.

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## CERTIFICATE OF PRESENTING AUTHORS

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THIS IS TO CERTIFY THAT

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WITH THE TITLE

**Serum and tissue angiotensin converting enzyme in patients  
with alopecia areata**

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# P1141: Serum and tissue angiotensin converting enzyme in patients with alopecia areata

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## Introduction

Alopecia areata (AA) is an immune dependent disorder characterized by the interaction of T-lymphocytes with follicular antigens.

Recent studies have shown the existence of local renin-angiotensin system (RAS) in the skin. In this system, angiotensin converting enzyme (ACE) plays a role in autoimmunity and inflammation.

## Purpose

The objective of this study was to evaluate serum and tissue ACE activity in AA patients.

## Participants

This case control study was conducted on patients with AA and healthy control in Razi Hospital, Tehran University of Medical Sciences, Tehran, Iran, from February to September 2016.

Patients with clinically diagnosed AA of the scalp or beard area who were 16 years or older were included.

The control group consisted of persons who were candidates for excision of their scalp pilar cyst. The normal skin over the cyst was used as control for the evaluation of tissue ACE activity.

They were selected as controls because we could obtain their normal skin without imposing unnecessary surgery.

## Methods

After getting informed consent, demographic and clinical data of the patients were collected. Then, 5 cc of serum was taken and a biopsy was performed in patients and controls.

Serum ACE activity was assessed using the ACE Kit (Audit Diagnostics Company, Ireland).

Tissue sections were stained with H&E for histologic diagnosis. Immunohistochemistry study was done in all samples.

We used "anti- angiotensin converting enzyme1 antibody (EPR2757) (ab75762)" at a dilution of 1/100 in skin specimens, (Abcam's RabMAb® technology).

## Results

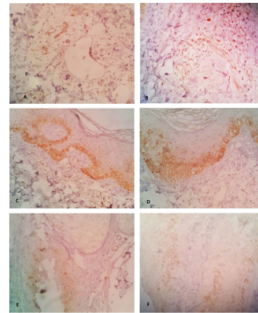
Details of tissue ACE activity in cases (n=22) and controls (n=24)

Tissue ACE activity	Cases, n (%)	Controls, n (%)	P-value
<b>Epidermis</b>			
0	4 (18.2)	1 (4.2)	0.004
1+	15 (68.2)	11 (45.8)	
2+	3 (13.6)	12 (50)	
<b>Follicular epithelium</b>			
0	7 (31.8)	1 (4.2)	0.001
1+	15 (68.2)	17 (70.8)	
2+	0 (0)	4 (25)	
<b>Endothelium</b>			
Negative	15 (68.2)	9 (37.5)	0.007
Positive	7 (31.8)	15 (62.5)	

## Results

Twenty-five AA patients (80% male, 40% female, mean age  $32.08 \pm 9.9$  years) and 24 controls (50% male, 50% female, mean age  $37.38 \pm 8.8$  years) were included.

The mean serum ACE activity was  $52.12 \pm 9$  U/L in cases and  $55.25 \pm 14.7$  U/L in controls ( $P = 0.37$ ).



A, B, Endothelium, positive for ACE in a patient and a control. C, D, Epidermis, strongly positive for ACE in a patient and a control. E, F, Follicular epithelium weakly positive for ACE in a patient and a control. (Immunohistochemical stain,  $\times 400$ )

The tissue ACE activity was significantly lower in cases in all parts of the skin i.e. epidermis ( $P=0.016$ ), follicular epithelium ( $P=0.004$ ), and endothelium ( $P=0.037$ ).

In the case group, serum ACE activity was significantly higher in patients with more severe disease ( $P = 0.030$ ), non-patchy AA (universalis, ophiasis, etc.) ( $P = 0.029$ ), and with nail involvement ( $P = 0.027$ ).

## Discussion & Conclusions

Unlike some other inflammatory diseases, the tissue level of ACE seems to be significantly lower in AA compared to normal controls.

Serum ACE was significantly higher in patients with more severe disease, which shows the role of ACE in the pathogenesis of AA.

## Recommendations

Assessment of role of RAS in AA in animal models to evaluate mRNA and protein expressions and the effect of ACE inhibitors on the immunomodulation in this system is recommended in future studies.

## References

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