

Assessment of Serum Level of Myostatin in Patients with Acne Vulgaris and its Relation to Insulin Resistance

M.A.Ibrahim, A.I.Mustafa, W.A.Abd El-Halim and S.H.Gendia

Dermatology, Venereology and Andrology Dept., Faculty of Medicine, Benha Univ., Benha, Egypt

E-Mail:A.125@gmail.com

Abstract

Ongoing examinations recommend that the dysbiosis focusing on predominantly *C. acnes* along with the actuation of the natural invulnerability may prompt the constant incendiary reaction in skin break out vulgaris. Myostatin might be adequate to upregulate irritation in essential human sebocytes. We intended to assess serum myostatin level in patients with skin break out vulgaris to assess its job in AV pathogenesis and its connection to insulin opposition. In this work, serum Myostatin levels were evaluated in 30 skin inflammation vulgaris patients. Additionally, connections of Myostatin with the sickness seriousness were researched and 20 obviously sound subjects as controls with matched age and sex. Serum level of Myostatin and HOMA-IR were estimated in the two gatherings utilizing ELISA. HOMA-IR was essentially higher in AV when contrasted with control gatherings ($p=0.001$). No noteworthy distinction was found in regards to FBG and insulin among cases and control gatherings ($p>0.05$ for both). AV bunch demonstrated altogether higher Myostatin when contrasted with control gathering (mean=507.3 versus 238.8, $p<0.001$). Myostatin level and HOMA-IR were proposed to be autonomous indicators of AV helplessness and seriousness. This propose a likely job of serum myostatin level as a hazard factor of IR and its related issues. We prescribed to evaluate the job of Myostatin in pathogenesis of skin break out vulgaris.

1. Introduction

Skin break out vulgaris is a profoundly common cutaneous incendiary issue. Over 85% of young people are influenced by skin inflammation and can experience the ill effects of the illness into adulthood [1].

The basic controllers of serum levels of myostatin have not yet be to completely recognized. Stomach heftiness, androgens, and skeletal bulk are the significant parts associated with myostatin combination and delivery. Notwithstanding, the components of relationship between circling insulin, glucose levels and serum myostatin have stayed to be completely clarified [2].

The Growth Differentiation Factor (GDF)-8/Myostatin (Mstn) is an individual from the Transforming Growth Factor (TGF)- β superfamily, fundamentally communicated in skeletal muscle cells and discovered likewise in other various cells and tissues, for example, cardiomyocytes, macrophages and vessels. It is orchestrated as a 376 amino corrosive pre-peptide, at that point prepared into an inhibitory propeptide of 242 amino acids and a functioning peptide of 110 amino acids [3].

Myostatin transgenic mice communicating myostatin in fat tissue had youthful adipogenesis bringing about lower body weight, serum fatty oil and fasting plasma glucose [4]. Regardless of some trial proof for an adverse job of myostatin on glucose and lipid digestion, information in people are scant. Discharge and articulation of myostatin has been demonstrated to be expanded and emphatically associate with HOMA-IR and BMI in skeletal muscle from very corpulent ladies [5]. In accordance with this, another investigation uncovered diminished myostatin protein levels in plasma and skeletal muscle after oxygen consuming activity just as a positive relationship with insulin obstruction [6].

Late examinations recommend that the dysbiosis focusing on predominantly *C. acnes* along with the initiation of the natural resistance may prompt the ceaseless fiery reaction in skin break out vulgaris. IGF-1 is likewise adequate to upregulate aggravation in essential human sebocytes [1].

We meant to assess serum myostatin level in patients with skin break out vulgaris to assess its job in AV pathogenesis and its connection to insulin obstruction.

2. Patient and method

This study will include 30 patients suffering from acne vulgaris (**Group A**). In addition, 20 apparently healthy individuals of matched age and sex will be chosen as a control group (**Group B**). All patients will be selected from the outpatient clinic of Dermatology and Andrology Department of Benha university Hospital.

2.1 Ethical considerations

Written informed consents will be obtained from all participants. The study will be approved by the ethics committee on research involving human subjects of Benha faculty of Medicine.

Type of the study

This is a prospective case-control study.

2.2 Inclusion criteria

Patient with AV and the diagnosis will be based on clinical findings and the severity of the lesions will be assessed according to the Global Acne Grading Scale (GAGS) [4].

2.3 Exclusion criteria

1- Patients with AV on topical therapy at least 2 weeks or systemic therapy at least 4 weeks before the study.

- 2- Patients with diabetes mellitus (DM).
- 3- Patients with hypertension or ischemic heart disease.
- 4- Patients with thyroid disorders, chronic renal or liver diseases.
- 5- Female patients with PCO or amenorrhea.

Each patient will be subjected to the following

- A complete history will be taken from each patient.
- Complete general examination including: Body mass index (BMI), waist circumference, systolic and diastolic blood pressure.
- Dermatological clinical examination will be done. Clinical details of all patients will be recorded.

2.4 Laboratory investigations

- Estimation of serum fasting glucose level in both acne vulgaris patients and control group.
- Estimation of serum levels of myostatin and insulin resistance using (ELISA) technique in both acne vulgaris patients and control group.

3. Results

The AV group mean age was 21.1 years, they were 15 females (50%) and 15 males (50%). In addition to 20 healthy control group, their mean age was 23 years, they were 11 males (55%) and 9 females (45%). Cases and control groups had matched age and gender ($p > 0.05$ for each).

HOMA-IR was significantly higher in AV when compared to control groups ($p = 0.001$).

No significant difference was found regarding FBG and insulin between cases and control groups ($p > 0.05$ for both).

Table (1) Comparison of laboratory data between cases and control groups.

	Control N=20		AV N=30		P
	N	%	N	%	
Fasting blood glucose (mg/dL)	91.4	12.2	93.5	8.7	0.477
Fasting insulin (mIU/mL)	14.7	4.8	10.8	3.4	0.210
HOMA-IR	1.2	0.3	3.5	1.1	0.001

AV group showed significantly higher Myostatin when compared to control group (mean=507.3 versus 238.8, $p < 0.001$).

Table (2) Comparison of Myostatin level between all studied groups.

	Control N=20		AV N=30		P
	mean	±SD	mean	±SD	
Myostatin (ng/mL)	238.8	75.4	507.3	170.4	<0.001

4. Discussion

No past examinations had evaluated level of myostatin according to skin inflammation so the current investigation is the first to do as such. Our outcomes uncovered that Myostatin level was altogether higher in skin break out gathering when contrasted with control gathering (mean=507.3 versus 238.8, $p < 0.001$). besides, there was a connection between's myostatin level and seriousness of skin break out evaluations. Pearson's connection coefficient uncovered critical positive relationship between's both HOMA-IR and myostatin with BMI and AV reviewing which can be credited to expanded insulin obstruction.

As of late relationship between myostatin, metabolic markers and insulin obstruction/affectability records was surveyed by [7] they examined coursing dynamic myostatin focus in the serum of twenty-eight seriously hefty nondiabetic patients contrasted with a sex and age coordinated lean and overweight benchmark group ($n = 22$). Insulin opposition/affectability was surveyed in the hefty gathering. The aftereffects of gathered examples from skeletal muscles and fat tissues have indicated that

Myostatin focus was expanded in corpulent contrasted with fit people, while myostatin fat tissue articulation didn't vary. Moreover, circling myostatin focus associated decidedly with insulin obstruction records and adversely with insulin affectability lists.

Additionally, past examinations have connected between the upregulation of myostatin and a few issues identified with insulin obstruction, for example, MS, corpulence, and type 2 diabetes [7,8].

A case control concentrate on patients with type 2 diabetes versus control subjects meant to evaluate plasma myostatin and articulation of myostatin in skeletal muscle. Skeletal muscle myostatin was higher in patients with type 2 diabetes than the benchmark group even modification for age and sex the examination finished up a positive relationship of muscle myostatin mRNA with the two BMI and insulin opposition by HOMA in patients with type 2 DM [9].

It was discovered that myostatin restraint can altogether lessen the movement of stoutness and diabetes, and myostatin influences the development and metabolic condition of different tissues, including the fat and the liver [8].

Also, D.S.Hittel et al., [5] examined the connection between's degrees of myostatin with corpulence and insulin opposition, and showed expanded articulation of myostatin protein with outrageous stoutness at the cell, organ, and fundamental level. The examination included 15 corpulent and very hefty ladies versus 5 lean ladies.

5. Conclusion

Myostatin level and HOMA-IR were significantly higher in AV cases when compared to control group.

Myostatin level and HOMA-IR were significantly correlated with BMI and AV grades.

Myostatin level and HOMA-IR were suggested to be independent predictors of AV susceptibility and severity, but not scar formation.

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