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Assessment of LC3 autophagy marker in psoriasis vulgaris patients with metabolic syndrome: a cross sectional study

Amr Abdelhamed[1]; Eman MS Muhammad[2]; Sheren FM Ahmed[2]; Asmaa MS Tamam[1]; Essam A Nada[1].

1: Department of Dermatology, Venereology & Andrology, Faculty of Medicine, Sohag University, Sohag, Egypt.

2: Department of Pathology, Faculty of Medicine, Sohag University, Sohag, Egypt.

Introduction

- Psoriasis vulgaris is one of the most prevalent chronic inflammatory autoimmune skin diseases.
- An association between psoriasis and metabolic syndrome (MetS) components has been recognized.
- Autophagy is an intracellular degradation system; in which a part from the cytoplasm is degraded by the lysosomes to form auto-phagosomes. It is essential for survival, differentiation, development, and homeostasis.
- Autophagy dysfunction may be an important contributor to metabolic diseases. However, no previous study investigates tissue autophagy in psoriasis patients with MetS.

Objectives:

A cross sectional study was conducted on psoriasis vulgaris patients and healthy control:

- To assess the immunohistochemical expression of LC3 in the tissue of patients with psoriasis vulgaris compared with controls;
- To evaluate the relationship between autophagy (LC3 expression), metabolic syndrome and psoriasis vulgaris.

Material and Methods:

This study included 38 patients of psoriasis vulgaris and 16 control.

Inclusion criteria:

- ✓ Only patients with typical clinical findings of psoriasis vulgaris (>6 months) and ≥aged 18 years.

Exclusion criteria:

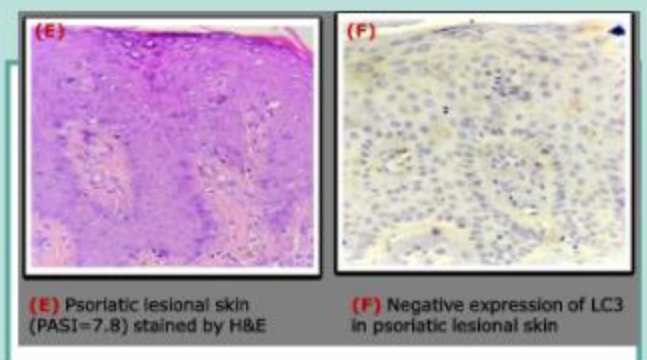
- x Other clinical varieties of psoriasis,
- x Patients receiving systemic treatment for 1 month before enrollment,
- x Pregnant women,
- x Advanced hepatic and renal failure.

Patients were evaluated by:

- PASI score;
- Laboratory investigations (lipid, blood sugar, CRP).
- Assessment of MetS using the Joint Interim Statement (JIS) (with Egyptian cutoffs)
- Punch skin biopsy (4mm) was taken from lesional and perilesional skin of patients and skin of control.
- H&E staining and immunohistochemical (IHC) expression of LC3 was done. A rabbit anti LC3B monoclonal antibody (D11, XP® #3868T, Cell Signaling Technology) was used.
- The IHC results were analyzed blindly
- The immunoreactive score (IRS) was determined by multiplying an estimate of the percentage of the immunoreactive cells with an estimate of the staining intensity

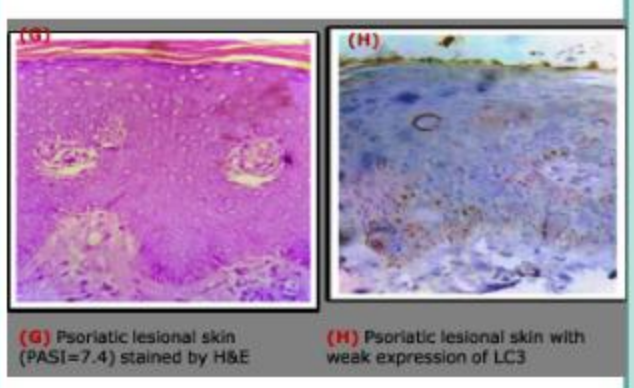
Results

- The current study was conducted on 54 subject (38 patients with psoriasis vulgaris and 16 healthy control).
- Patients group was mainly males n=27 (71.1%) with a mean of age 48.45±14.94 years, while control group was equal in sex n=8 with a mean of age 45.38±14.04 years.
- Prevalence of MetS was 42.1% among psoriasis vulgaris patients, and 25% among control group.
- LC3 expression was strong in control (Fig A-B); moderate expression in perilesional (Fig C-D); with negative (Fig E-F)/ weak expression (Fig G-H) in lesional psoriatic skin.
- LC3 expression was nearly absent in epidermis of lesional skin of psoriasis, while it was strong among control (p=0.001) (Figure 1)
- Also, LC3 expression in lesioanl skin of psoriasis vulgaris patients was lower than its expression in perilesoinal (p=0.001) (Figure 1).
- However, LC3 expression was not significantly changed with the presence of MetS (Figure 2) or psoriasis severity according to PASI score (Figure 3). .



(E) Psoriatic lesional skin (PASI=7.8) stained by H&E

(F) Negative expression of LC3 in psoriatic lesional skin



(G) Psoriatic lesional skin (PASI=7.4) stained by H&E

(H) Psoriatic lesional skin with weak expression of LC3

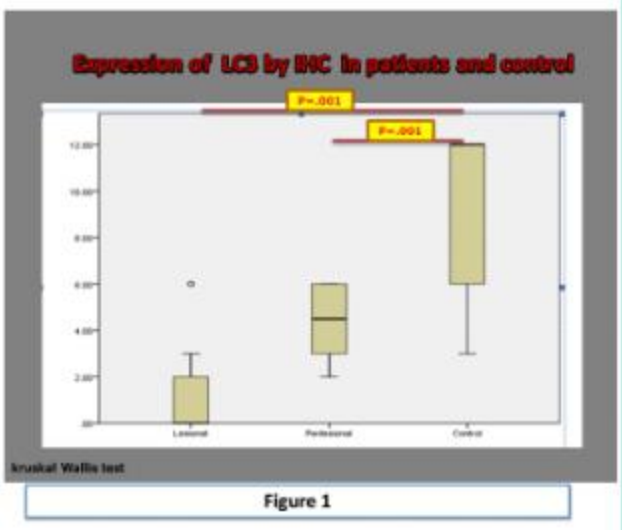
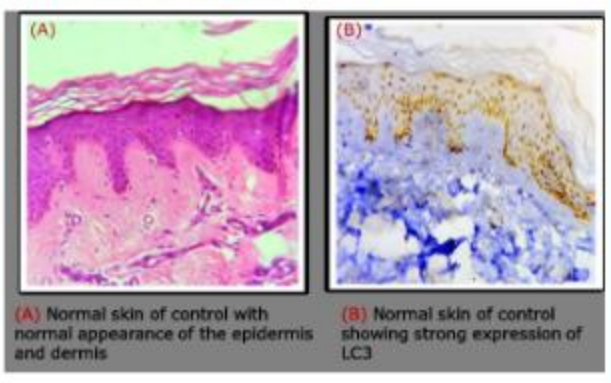
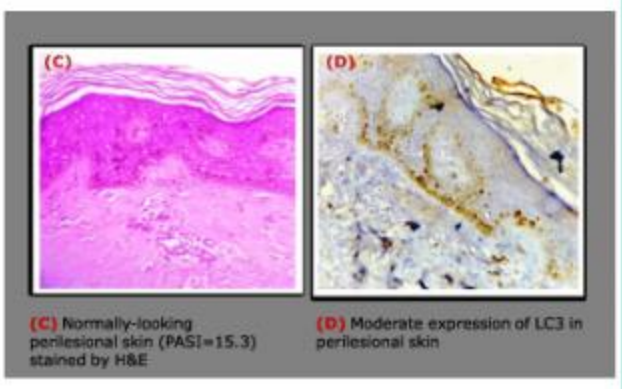


Figure 1



(A) Normal skin of control with normal appearance of the epidermis and dermis

(B) Normal skin of control showing strong expression of LC3



(C) Normally-looking perilesional skin (PASI=15.3) stained by H&E

(D) Moderate expression of LC3 in perilesional skin

Expression of LC3 by IHC in lesional psoriasis with &without MetS and control with & without MetS.

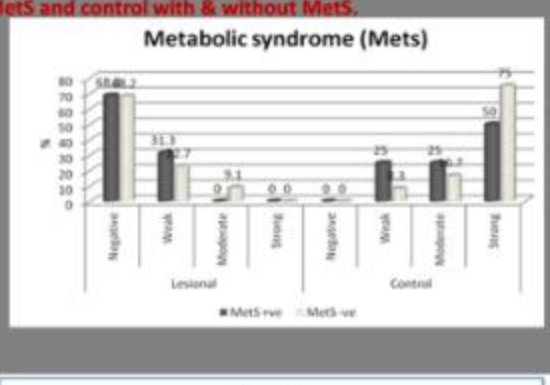


Figure 2

Relationship between LC3 expression and psoriasis severity according to PASI score

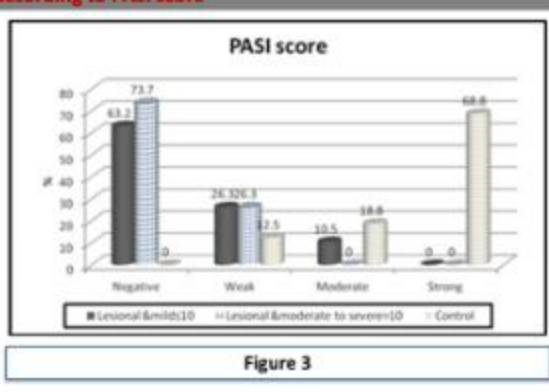


Figure 3

Conclusion:

- There could be a potential link between psoriasis vulgaris and autophagy marker LC3 with lower skin expression in patients than in control.
- However, its expression did not change with severity or MetS.
- Autopahgy enhancer might be used as a possible therapeutic target.