

## Are programmed cell death protein-1 and Angiopoietins-2 effective biomarkers for detection the severity of psoriatic patients?

### Abstract

**Background:** Early detection of psoriasis is still an open discussion. Psoriatic lesions are characterized by red/scaly plaques affecting different body-sites.

**Objectives:** To evaluate the levels of programmed cell death protein-1(PD-1) and Angiopoietins-2(Ang-2) in serum, lesional, and perilesional of psoriatic patients and correlate them with controls and disease severity.

**Subjects and Methods:** Serum samples were obtained from 40 participants subdivided equally into psoriatic and healthy controls, 4 mm punch biopsy equally from lesional and perilesional skin of individuals. PD-1/ ANG-2 ELISA kits were used for determining the serum and tissue levels among groups.

**Results:** Serum and tissue levels of PD-1 and Ang-2 were overexpressed in psoriatic patients compared with controls. There was a statistical difference between patients and controls in level of PD-1(serum and tissue) with  $p$ -value 0.006 and 0.0001, respectively. There was a statistical difference between both groups for ANG- (serum and tissue) with  $p$ -value 0.03 and 0.0001, respectively. There were positive correlations between PASI score and PD-1 in tissue ( $r = 0.467$ ,  $p = 0.038$ ). Also, positive correlation between the level of PD-1 in serum and tissue ( $r = 0.369$ ,  $p = 0.019$ ), the serum levels of PD-1 and ANG-2 ( $r = 0.78$ ,  $p > 0.0001$ ), PD-1 and Ang-2 in tissue ( $r = 0.583$ ,  $p = 0.0001$ ) were detected.

**Conclusion:** PD-1 and ANG-2 can be highly recommended to determine the severity of psoriasis.

**KEY WORDS:** angiogenesis, Angiopotien-2, pathogenesis, Psoriasis