

Does Pomegranate Seed Oil Affect Protein Expression Levels

Aysun ÇETİN¹, Semih YILMAZ², Nur TUFANOĞLU¹, Leyla ÇİMEN¹, Seher Elif KULOĞLU¹

¹Department of Medical Biochemistry/Faculty of Medicine, Erciyes University, Turkey

²Department of Agricultural Biotechnology/Faculty of Agriculture, Erciyes University, Turkey
aysuncetin@yahoo.com

Aim of the study: Pomegranates with various anti-inflammatory, antimicrobial, and antioxidant effects have several health benefits. The aim of the present study was to provide insight into potential effects of pomegranate seed extract on protein expression levels in rats orally supplemented with pomegranate oil.

Material and Methods: Thirty adult rats at the age of 10 weeks were orally administered pomegranate seed oil extract for three weeks through gavage. Ten rats were used as control treatment. The rats were reared under 12 hour light/12 hour dark photoperiod at $25 \pm 2^\circ\text{C}$ temperature. Water and diet were supplied ad-libitum to control rats, but experimental subjects were administered with pomegranate seed extract oil (100mg/kg body weight) through gavage for three weeks. At the end of 20th day of treatments, rats were anesthetized and sacrificed. Skin tissues were excised for homogenization and protein extraction. The amount of protein in samples from each rat was determined by the Bradford method and equalized prior to SDS-PAGE analysis under reducing conditions. After electrophoresis, protein bands were stained with silver and visualized by Bio-Rad ChemiDoc MP (v.5.1).

Results: Minor differences were observed in protein expression levels of rats because of individual variations among them; however, significant differences were observed in protein expression levels of pomegranate seed oil-treated rats on 10th day as compared to 3rd day. Such differences in protein expression levels can clearly be visualized at approximately 250, 101, 83, 64, 50, 45, 25, and 12 kDa major bands. With regard to protein expression levels, the highest level was observed in samples taken on 20th day. In addition, while two protein bands at approximate molecular weights of 10 and 11 kDa were not visible in samples obtained in 3rd and 10th days, they became apparent in 20th day. This difference was more prominent when the samples from 3rd and 20th days were compared. While the bands between 12-23 kDa were expressed in some of the samples taken in 20th day, they were not seen in control samples. Considering entire findings, it was concluded that pomegranate seed oil might alter expression levels of the proteins such as keratinocyte growth factor (KGF, 20 kDa), fibroblast growth factor (FGF, 7-38 kDa), epidermal growth factor (EGF, 6.3 kDa), transforming growth factor (TGF, 12-12.8 kDa), and platelet derived growth factor (PDGF, 24.4 kDa) in skin tissue of rats. Further research is recommended to better elucidate the effects of pomegranate seed oil on expression levels of above-specified proteins.

Keywords: Pomegranate seed oil, protein expression level, rat, growth factor