The aim of the present study was to evaluate the expressions of beclin 1 and bcl-2 in prostate cancer (PC) and high grade prostatic intraepithelial neoplasia (HGPIN), and to investigate their relationship with clinicopathological parameters. The study included 30 benign prostatic hyperplasia (BPH), 40 HGPIN and 106 primary PC cases. The expressions of beclin 1 and bcl-2 were assessed semiquantitatively based on both the percentage and intensity of positive staining cells. Beclin 1 was positive in 27 (90%) BPH, 37 (92.5%) HGPIN, and 90 (84.9%) PC cases (p > 0.05). Bcl-2 immunostaining was detected in 99 (93.4%) PC, 37 (92.5%) HGPIN, and 9 (30%) BPH cases (p < 0.0001). Regarding expression scores, beclin 1 was significantly lower in PC cases than in the HGPIN and BPH groups (p < 0.0001), and it was also negatively correlated with Gleason score (p = 0.004, r = −0.274). Bcl-2 expression score was significantly higher in PC than in the other groups (p < 0.0001), and it was also positively correlated with Gleason score (p < 0.0001, r = 0.425). Furthermore, a negative correlation was found between bcl-2 and beclin 1 expression scores in PC cases (p = 0.006, r = −0.265). Our results suggest an association between bcl-2 and beclin 1 expressions in malignant transformation of prostate tissue and also in regulating PC cell differentiation, progression and the aggressiveness of PC.