Angiogenesis Comparison between BPH and Prostate Cancer Using Immunohistochemical Methods

Introduction and Objective: Benign prostatic hyperplasia and carcinoma are undoubtedly the two most common disease entities of the prostate gland. Common denominator in both diseases is angiogenesis. Purpose of this study was to compare angiogenesis between hyperplasia and carcinoma using markers of angiogenesis. Possible correlation with Gleason score and stage of the disease was also recorded.
Material and Methods: We retrospectively studied files from the Department of Pathology, University Hospital of Ioannina. 51 cancer cases (radical prostatectomy specimens) and 51 prostatic hyperplasia cases (transurethral and transvesical prostatectomy specimens) were randomly selected. For all samples hematoxylin-eosin and immunohistochemical staining was performed, using antibodies against VEGF (Vascular Endothelial Growth Factor), Flt1 (VEGF receptor 1, Flk1 (VEGF receptor 2) and CD105 (endoglin). The intensity (scale +, + +, + + +) and the percentage of cells expressing the above markers were recorded. CD105 marker was used to study the microvascular density (MVD).
Results: Patients with carcinoma had significantly higher rates of expression for VEGF, Flt1, Flk1 and also higher MVD ($p = 0,000$, $p = 0,000$, $p = 0,003$, $p = 0,000$ respectively) compared to patients with hyperplasia. In carcinomas statistically significant correlations between Flt1-Flk1 ($p = 0,015$), Flt1-VEGF ($p = 0,021$), Flt1-Gleason ($p = 0,007$), VEGF-Gleason ($p = 0,05$), CD105-Gleason ($p = 0,04$), VEGF-clinical stage ($p = 0,017$) were also observed.
Conclusions: Our study showed that angiogenesis is significantly higher in prostate carcinoma compared to hyperplasia and appears to correlate with differentiation and stage of the disease. Markers of angiogenesis could be probably be used in order to determine prostate cancer prognosis. Novel cancer therapies with antiangiogenic agents such as bevacizumab (anti-VEGF antibody) have shown considerable effectiveness in prostate cancer.