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Benign prostate hyperplasia and prostate carcinogenesis after the chernobyl accident in Ukraine

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During the 26-years period subsequent to the Chernobyl accident the morbidity of prostate cancer in Ukraine has increased from 12.0 to 28.6 per 100 000 of male population. The present study was conducted to evaluate the development of radiation-dependent lesions in benign prostate hyperplasia (BPH) patients living in cesium 137 (^{137}Cs) contaminated areas of Ukraine.

BPH samples were obtained by adenomectomy from 30 patients from so called clean (without radio-contamination) areas (control group 1) and 90 patients living in ^{137}Cs contaminated areas of Ukraine (group 2). These BPH samples were examined histologically and immunohistochemically (IHC). γ-H2AX, iNOS, Ki-67, p53, p63, p27Kip1 and Bcl-2 proteins were IHC investigated in BPH samples from all patients.

A pattern of chronic proliferative atypical prostatitis (CPAP) accompanied with large areas of sclerotic stromal connective tissue with increased angiogenesis, in association with dramatic increase in the incidences of areas of proliferative inflammatory atrophy (PIA), basal-cell hyperplasia (BCH) with cellular atypia as well as with the areas of prostatic intraepithelial neoplasia (PIN) were detected in group 2 BPH patients.

Our data support a strong relationship between long-term low-dose ^{137}Cs radiation exposure of BPH patients who lived about 26 years in radio contaminated areas and development of CPAP, a possible preneoplastic condition in humans. Our study suggests the alteration of cell cycle transition and apoptotic regulatory molecules in association with γ-H2AX and iNOS over expression at the areas of PIA and BCH with cellular atypia which could be also crucial early molecular events in the pathogenesis of the radiation induced prostate carcinogenesis.

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Population-based screening for Prostate cancer by measuring total serum prostate-specific antigen in Iran

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Objective: To report the results from an Iranian large population-based randomized study of screening using prostate-specific antigen (PSA) to detect prostate cancer.

Materials and Methods: A total of 3758 Iranian men older than 40 years were mass checked by PSA-based screening. Men with an abnormal digital rectal examination (DRE) and serum total PSA level of greater than 4 ng/mL, underwent transrectal ultrasonography (TRUS)-guided extended prostate biopsy.

Results: The PSA value (mean standard deviation, SD) in all men without prostate cancer was 1.6 _ 1.1 ng/mL and in those with cancer18 _ 44.8 ng/mL (P=0.001). PSA values increased with age. In those aged 40-49, 50-59, 60-69 and_70 years, the mean_SD PSA valueswere1.3 _ 0.7, 1.4 _ 0.8, 1.8 _ 1 and 2.2 _ 1.6 ng/mL, respectively. Among the screened men, 323 (8.6%) had a serum PSA concentration greater than 4 ng/mL. Of patients who underwent prostate biopsy (230, 71.2%), 129 (positive predictive value, 56.1%) had prostate cancer. Additionally, nine cancers were detected among 16 patients with PSA of less than 4 ng/mL who had a doubtful DRE finding. The overall cancer detection rate was 3.6%, 1.4% at 40-49, 1.6% at 50-59, 4.2% at 60-69 and 12.9% at _70 years. Conventional systematic sextant biopsies, which accounted for six of the 10 cores in our biopsy scheme, detected 98 (71%) of the cancers.

Conclusions: The Iranian male population develops prostate cancer quite commonly if their serum PSA levels are greater than 4.0 ng/mL. In this study, 65.9% of the detected cancers were clinically significant. The conventional systematic sextant technique may be inappropriate for detection of all prostate cancers. The results need to be confirmed in other randomized trials.

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