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Opportunities for early detection of prostate cancer in young men

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Introduction: Prostate Cancer (PCa) is a public health problem; it ranks second in incidence in 105 countries and fifth among causes of death in 46 countries. PCa is sometimes verified in men younger 50 years of age, including the metastatic stage. Common methods for diagnosing PCa are not always accurate, the algorithm has not been finalized.

Materials and methods: We studied data on the epidemiology and prevalence of PCa in men aged 40-50 years (PubMed, CrossRef and Scopus databases), having obtained data on the probable causal relationship of factors influencing the development of PCa. Also, we perform an IHC-study on 10 PCa samples of patients 40-51 y.o. in tumor stages pT1cN0M0-pT2cN0M0 after radical surgical treatment in one clinic (Sechenov Medical University) in 2016-2019. The preoperative PSA (3.5-9.86 ng/ml) and malignancy criteria parameters (4 - ISUP-1, 4 - ISUP-2, 2 - ISUP-3) were studied. All patients underwent RARP, without technical features and postoperative complications. The study was carried out as part of a joint research program of two Russian state medical universitiest.

Results: When the preparations were reviewed by a third-party morphologist, the tumor in the apex of the gland was absent only in 1 case (10%), the tumor in both lobes of the gland were present in all, without perineural lymphovascular invasion and urethral lesions. A positive margin of surgical resection was noted in 1 case (0.2 cm). Due to IHC, it was found that Ki-67 was detected in 1-5% of samples, b-catenin – 3 points with membrane staining up to 100%, e-cadherin – from 1 to, maximum, 3 points (pT1cN0M0 ISUP-1). Mutations in EGFR, TP-53 and BCL-2 were not detected. Loss of heterozygosity for BRCA2 was verified in 1 case of pT2cN0M0 ISUP-2, for RB-1 – in 1 pT2aN0M0 ISUP-3, for PTEN – in 2 samples pT2cN0M0, ISUP-1 and ISUP-2.

Conclusion: The diagnosis and treatment of men younger 50 y.o. with PCa are of great medical importance. Hence, that is lack of samplings among young men, as well as the high cost of the proposed genetic studies, which leads to late diagnosis of the tumor. It is planned to compare the obtained results of IHC with the further fate of the observed patients: indicators of the overall and cancer-specific survival, frequency of medical consultations, PSA dynamics, etc., as well as to increase the sample of the group and compare the results with the study of the control's (men over 50 years old). The study of a combination of risk factors for the development of PCa in young patients will allow us to formulate a new diagnostic approach based on personal molecular genetic information.

Keywords: prostate cancer, immunohistochemical study, mutations, cancer screening, young men

Recent Publications

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