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Editorial

Genetic Testing In Urology

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Research into the genetic basis of Urology is gaining momentum. There is expanding clinical evidence that gene panels applied to patients have reasonable diagnostic yields. Any genetic testing must be within the context of a full metabolic screen. However, there are currently very few modified treatment strategies. As an example, in stone disease, further work is needed to expand our understanding of the genetics behind it and develop novel prophylactic medications. In the future, we anticipate that whole genome sequencing and the application of virtual gene panels will become the gold standard, as this allows a complete genome landscape analysis as well as retrospective analysis when additional risk alleles are identified in research studies [1]. Authors have found that genetic testing provided an accurate diagnosis for children and, in some cases, led to further diagnoses in seemingly asymptomatic family members and changes to overall medical management. Genetic testing, as facilitated by such a specialized clinical setting, thus appears to have clear utility in the diagnosis and counseling of patients with a wide range of kidney manifestations [2].

Genetic testing for prostate cancer is rapidly growing and is increasingly being driven by precision medicine. Unlike somatic cells, germline cells (including primordial germ cells) undergo meiosis, allowing hereditary mutations to pass to the next generation, potentially causing inherited disorders or cancer predispositions. Rates of germline pathogenic variants have been reported in up to 15% of men with prostate cancer, particularly in metastatic disease, and results of genetic testing could uncover options for precision therapy along with a spectrum of hereditary cancer- predisposition syndromes with unique clinical features that have complex management options. Thus, the pre-test discussion, whether delivered by genetic counsellors or by health-care professionals in hybrid models, involves information on hereditary cancer risk, extent of gene testing, purpose of testing, medical history and family history, potential types of results, additional cancer risks that might be uncovered, genetically based management, and effect on families. Understanding precision medicine, personalized cancer risk management, and syndrome-related cancer risk management is important in order to develop collaborative strategies with genetic counselling for optimal care of patients and their families [3].

While genetic testing in prostate cancer is routinely recommended and numerous guidelines exist, there is still a considerable lack of consensus regarding who should be tested and how they should be tested. Further evidence is needed to inform value-based genetic testing strategies for implementation in practice. Prostate cancer is a common and heterogeneous disease, and hereditary prostate cancer is an important clinical consideration with numerous epidemiological and hereditary risk factors. Further developments in genetic testing have the potential to advance the science around prostate cancer predisposition, just as personalized screening and testing can contribute to more accurate knowledge of the mechanisms of hereditary prostate cancer. While recent reviews of economic evaluations of breast, ovarian, and colorectal cancer suggest genetic testing is likely to be cost-effective for patients in some settings, currently, there is a lack of economic evaluation and cost-effectiveness evidence for genetic testing of prostate cancer. This evidence is imperative to inform who should be tested, how they should be tested, and the most appropriate management pathway. A consensus or a standardized approach to genetic testing for prostate cancer is crucial to determining the value of genetic testing for prostate cancer. However, there is also recognition of a need for flexibility and innovation in the delivery of genetic testing in countries and/or regions that do not have the resources to deliver genetic testing as per internationally or nationally recognized guidelines [4].

Recent studies have demonstrated a broader genetic landscape in patients with prostate carcinoma. Mutations in BRCA1/2, MMR, CHEK2, PALB2, and HOXB13 genes are associated with an increased risk of developing PCa. The implementation of genetic testing in clinical practice, especially in young patients with aggressive tumors, represents a new challenge for the coming years. Genetic testing enables better sorting of patients with prostate carcinoma who may receive targeted therapies [5]

Prostate cancer (PCa) is one of the most common cancers in developed countries. The results of large trials indicate that the

proportion of PCa attributable to hereditary factors is as high as 15%, highlighting the importance of genetic testing. Despite improved understanding of the prevalence of pathogenic variants among men with PCa, it remains unclear which men will most benefit from genetic testing. In summary, the implementation of genetic testing in clinical practice, especially in young patients with aggressive tumors or those with positive family history, represents a new challenge for the coming years and will identify men with pathogenic variants who may benefit from early screening/ intervention and specific therapeutic options.

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