P012 Biology of telomeres in prostate cancer: Development of new risk models

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Rubio Galisteo J.M.[1], Gomez Gomez E.[1], Cano Castiñeira R.[2], Fernández L.[3], Blanca Pedregosa A.[1], Esteban L.[3], De Pedro N.[3], González S.[4], Guler I.[1], Carrasco Valiente J.[1], Requena Tapia M.J.[1], Najarro P.[3]

[1]Reina Sofía University Hospital, IMIBIC, UCO, Dept. of Urology, Córdoba, Spain, [2]Infanta Margarita Hospital, Dept. of Urology, Córdoba, Spain, [3]LifeLength, Madrid, Spain, [4]Sermes CRO, Madrid, Spain

Introduction & Objectives: To explorethe role of Telomere Associated Variables (TAVs) as a complementary marker in the diagnosis for patients with suspected prostate cancer (PCa), analyzing their application in new risk models for significant PCa (GS >6).

Materials & Methods: A prospective study (ONCOCHECK; EU funded Grant No.738707 [PN1]) was conducted on patients with suspicion of PCa undergoing prostate biopsy according to clinical practice. Biopsy naïve patients with a PSA 3-10 ng/ml were selected. An analytically validated (ISO15189) high-throughput fluorescence in-situ hybridization (HT-Q-FISH) technique was used to evaluate the TAVs. This methodology determines absolute individual telomere lengths in peripheral lymphocytes. Clinical data from each subject including PSA, free- PSA and age was also recorded. The cohort (n=401) was randomly split into 2/3 and 1/3 for training and internal validation of the model, respectively. The utility of the risk predictor was evaluated by analyzing its predictive capacity and accuracy, summarized by ROC curves, and its clinical benefit with decision curves analysis.

Results: The median age was 63 years, with a median PSA of 5 ng/ml and a percentage of PCa diagnosis of 40.6% and significant PCa of 19.2%. Two risk models were selected (initial and refined) with an AUC ≥0.83 in the full study cohort, and AUC (0.76-0.79) in the validation cohort, improving clinical parameters accuracy. Both models showed an improvement in decision capacity when compared to the application of the PCPTv.2 (Prostate Cancer Prevention Trial) +free PSA, in the low risk probabilities range. In the validation cohort, with the initial model, 33% of biopsies would be avoided without losing any significant PCa. With the refined model, 48% of biopsies would be avoided at the cost of losing 2% significant PCa.

Conclusions: Telomere biology through the TAVs is a new risk-score biomarker with clear potential to increase the prediction capacity of significant PCa in patients with PSA between 3-10 ng/ml. These results warrant clinical efficacy studies to consolidate their implementation into clinical practice.