The Grade Group in the New Grading System for Prostate Carcinoma Could be Predicted by the PCA3 Urine Test

Natalia Rodon[1], Isabel Trias[1,2,3], Montse Verdú[1,2], Miquel Calvo[4], Josep Mª Banus[5] , Olga Diaz[1], Yessica No Garbarino[1] & Xavier Puig[1,2,3].

[1]BIOPAT. Biopatologia Molecular SL, Grup Assistència. Barcelona. Spain; [2]Histopat Laboratoris, S.L. Barcelona, Spain; [3]Hospital de Barcelona, SCIAS, Grup Assistència. Barcelona. Spain,
[4]Department of Statistics. Universitat de Barcelona, Barcelona. Spain; [5]ICUN, Institut Català d'Urologia, Barcelona. Spain.

BACKGROUND

In this study the association between the Grade groups in the new Grading System for prostate cancer (PCa) (Table1) proposed by the International Society of Urological Pathology (WHO Classification of Tumours. 4th ed. 2016) and the PCA3 urine test was evaluated.

Grade Group	Gleason Score
1	≤6
2	3 + 4 = 7
3	4 + 3 =7
4	8
5	9-10

Table1. Grade groups in the new Grading System for prostate cancer (WHO. 4d ed. 2016).

DESIGN

This retrospective study included data from consecutive patients with suspected PCa who presented to the urology office between November 2009 and April 2016 and were candidates for prostate biopsy. A total of 1038 urine samples were tested with a kit that generated a PCA3 score (s-PCA3). A prostate biopsy (Pbx) was recommended only in those patients with s-PCA3 ≥ 35. When a PCa was diagnosed the following variables were recorded: the percentage of cylinders affected by tumor, the Gleason score and its corresponding Grade group. When associations with aggressiveness parameters were evaluated a cut-off of 50 was used for the s-PCA3 and a 33% for the affected cylinders. Associations between variables were analyzed using the R software.

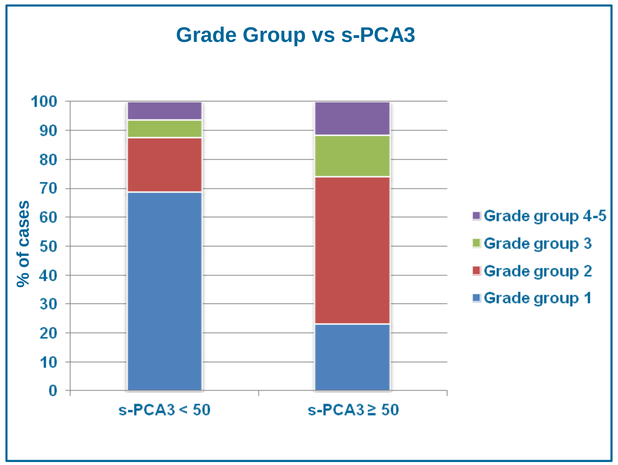

Figure 1. Distribution of Grade groups according to the s-PCA3 in patients with diagnosis of prostate cancer.

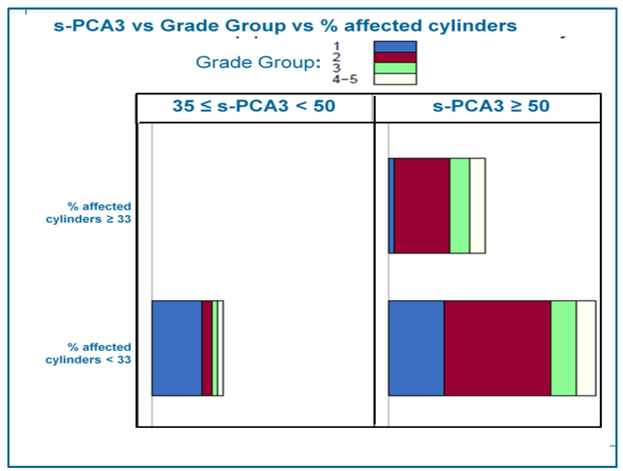

Figure 2. Bar chart of the log-linear model containing the s-PCA3, the Grade Group, and the percentage of affected cylinders in the biopsy (n=74).

RESULTS

In patients with a positive s-PCA3 (44.5%), a subsequent Pbx was recommended. A total of 151 Pbx were studied, 56.3% yielded a diagnosis of PCa. The probability of a positive Pbx increased as the s-PCA3 increased (p=0.041). A statistically significant relationship was observed between the Grade groups and the s-PCA3 (p=0.008). The 68.8% of patients with a positive s-PCA3 < 50 were in the Grade group 1 while the 76.8% of patients with a positive s-PCA3 ≥ 50 were assigned to Grade group 2 or higher (Figure 1). The best log-linear models and a logistic model confirmed the relationships between s-PCA3 and Grade groups shown previously (Figure 1) with Fisher's exact tests. A statistically significant relationship was also observed between the s-PCA3 and the Gleason score (p=0.001). The percentage of affected cylinders increased as the s-PCA3 increased (p=0.015) and no patient with a positive s-PCA3 lower than 50 had more than the 33% of cylinders affected (Figure 2).

CONCLUSIONS

•To our knowledge this is the first time that an association has been demonstrated between Grade group in the new Grading System and the PCA3 score.

•The PCA3 score may avoid overdiagnosis and overtreatment of PCa. The s-PCA3 prognostic significance was also supported by its association with tumor volume and Gleason score.

USCAP 2018. Vancouver, Canada.