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TISSUE BIOMARKERS FOR PROSTATE CANCER PROGRESSION AND THEIR IMAGE ANALYSIS

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Background

The course of prostate cancer is variable ranging from indolent cases to agressive cancers requiring intervention. This article evaluates the association between Gleason grade, serum PSA, clinical stage and tissue biomarkers – of which tetraspanin family member CD151 and extracellular matrix protein periostin seem promising.

Results

Tertiary Gleason positively correlated with Ki67 (Rs 0.21, p=0.045) and periostin stromal expression (Rs 0.28, p=0.008) while negative correlation was observed for membrane b-catenin (Rs -0.21, p=0.035). Gleason grade groups were in negative association with E-cadherin (Rs -0.2, p=0.045) while with nuclear Skp2 and periostin stromal expressions showed positive association (Rs 0.34 and 0.27, p=0.001 and 0.008, resp.). Membranous CD151 expression was in positive association with its cytoplasmic expression (Rs 0.76, p<0.001), CD151 also showed strong positive association with periostin stromal expression and nodal status (Rs 0.28, p=0.027). CD151 was significantly increased in metastatic group in comparison to localised and advanced ones (p=0.01) (Table 1). ROC curve analysis showed that Periostin digital score had better predictive potential in comparison to IHC score. (figures 1 and 2).

-1 -0.3 1	PSA total	GS sum	GS group	Tertiary Gleason	beta-catenin membrane	beta-catenin cytoplasm	beta-catenin nuclear	E-cadherin	Vimentin cytoplasm	Vimentin stroma	Ki67	p53	Skp2 nuclear	Skp2 cytoplasm	Skp2 stroma	AR nuclear %	AR	Slug nuclear	periostin cytoplasm	periostin stroma	versican cytoplasm	versican stroma	Nodal status	stage	CD151
PSA total								_	1-	-				1				1.00			-				
GS sum											_														
GS group																									
Tertiary Gleason																									
beta-catenin		-																				-			
beta-catenin															_										
beta-catenin																									
E-cadherin				-																					
Vimentin																									
Vimentin stroma																									
Ki67										0		1											1		
p53																									
Skp2 nuclear															23										
Skp2 cytoplasm													<u>60.</u>												
Skp2 stroma				1																					
AR nuclear %										1								1							
AR	1																								
Slug nuclear																									
periostin cytoplasm																		1		i i					
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GSsum_recod																									
Nodal status					_																				
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CD151																							1		

Table 1. Correlation table between protein expressions and clinical and pathological variables.

Conclusion

This study is the first to validate positive association of CD151 and periostin tissue expressions. Periostin digital score had better predictive value for prostate cancer progression.

Methods

Formalin fixed paraffin embedded tissues of 101 prostate carcinomas were stained immunohistochemically for CD151, E-cadherin, b-catenin, vimentin, Skp2, Slug, Ki67, AR, periostin and versican, and scored. Carcinomas were classified into localized, advanced and metastatic groups, and ISUP Gleason grade groups, tissues reviewed for the presence of tertiary Gleason. Statistical analysis was performed by SPSS. Image analysis was performed for selected proteins (Figures 3 and 4).







Model 3.1



Figure 1. Periostin immunohistochemistry image analysis for digital score calculation.

Figure 2. ROC curves for periostin histoscore and digital score.



Figure 3. ISUP 2014 Gleason grade groups.

Figure. 4. Tertiary Gleason in prostate tissue histotope.

The study was supported by grant DRO: FNOL 00098892 from the Czech Ministry of Health.