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Research Article

Demonstration the Expression of α-Methyl Acyl-Co EnzymeA Racemase, P63 and high- molecular-weight cytokeratin in Prostate biopsies in Khartoum State Hospitals

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ABSTRACT

Prostate cancer is the major health problem throughout the world. PCa remains the most common malignancy affecting men and the second leading cause of cancer-related death of men. The immunohistochemistry plays a very important role in the diagnosis, but it's largely depends on panels of markers. Materials and Methods: This is descriptive cross sectional study carried out in Khartoum state hospitals during the period from November 2015 to September 2016. One hundred samples formalin fixed paraffin embedded biopsies were collected including 50 with BPH and 50 with adenocarcinoma of PCa and applied by tissue micro array for IHC staining using p63, high molecular weight cytokeratin(HMWCK) and alpha methyl acyl co A racemace(AMACR) with polymer method. Results: One hundred samples were collected, out of which 43 (86%) of 50 samples benign prostatic hyperplasia and 46 (92%) of 50 samples adenocarcinoma were over the Age 60. Our result show that 33 of 50 samples had G.S 4,6,7 each of them had 11 frequencies 12 of 50 samples had G.S 5, and 5 of 50 samples with G.S 8. In our results we show that in 50 samples of BPH 7, 44 and 40 were positive in AMACR, P63 and HMWCK respectively. Also we found in 50 samples of adenocarcinoma 40, 5 and 8 were positive in AMACR, P63 and HMWCK. Conclusions: immunohistochemistry is helpful and necessary to distinguish prostate cancer from benign mimickers, and we have to use AMACR, P63 and HMWCK in combinations in routine diagnosis.

Key words: Prostate cancer, immunohistochemistry, high molecular weight cytokeratin, alpha methyl acyl co enzyme a racemace, benign prostatic hyperplasia.

Introduction

Prostate cancer is the most common non-skin cancer in America, affecting 1 in 7 men In 2015(Anton and Matthias.2008)

In Sudan prostate cancer is a leading cause of death. An estimated 12.7 million new cancer cases occurred in 2008, of which about 715,000 new cancer cases resulted in 542,000 deaths. (Amany et al.2015). The immunohistochemistry plays avery important role in the diagnosis, but its largely depends on panels of markers because no absolutely specific and sensitive marker for prostate cancer has yet been discovered. These panels usually include at least one basal cell-specific marker (p63 and high- molecular-weight cytokeratin (HMWCK) and the prostate cancer-specific marker, alpha-methyl-CoA-Racemase (AMACR). (Jiang, 2004)

Alpha-methylacyl-CoA-racemase (AMACR), an enzyme involved in β-oxidation of branched chain fatty acids and bile acid intermediates AMACR was strongly and uniformly positive in 97% to 100% of prostate cancers. (Zhou et al. 2004)

Of the 26 atypical or suspicious cases, 18 cases were positive for high molecular weight cytokeratin (high molecular weight cytokeratin, HMWCK) only, 4 cases were positive for AMACR only, and 4 cases showed positivity for both HMWCK and AMACR.(Gurmeen, K et al. 2013)

P63 is another useful marker in differentiating high grade urothelial from prostatic adenocarcinoma. Using tissue microarrays, we found p63 to have a

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greater specificity compared to high molecular weight cytokeratin (100% specificity and 83% sensitivity). (Varma, M et al. 2003).

Subject:

The goal of this study to demonstrate the expression of α-methyl acyl co-enzyme A racemase, P63 and high- molecular-weight cytokeratin in prostate biopsies in khartoum state hospitals.

Materials and Methods:

One hundred samples were collected for this descriptive cross sectional study that carried out in Khartoum state hospitals during the period from November 2015 to September 2016. There were 50 samples with benign prostatic hyperplasia (BPH) and 50 with adenocarcinoma of PCa and applied by tissue micro array for immunohistochemistry (IHC) staining using p63, high molecular weight cytokeratin(HMWCK) and alpha methyl acyl co A racemace(AMACR) with dextran labeled polymer method.

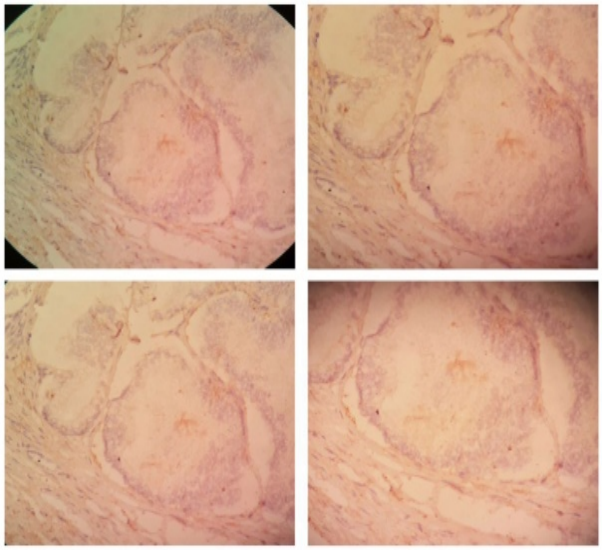

Figure 1: HMWCK: expression of high molecular weight cytokeratin (HMWCK) which are basal cell marker membranous and cytoplasmic in reaction expressed mainly in benign prostatic hyperplasia(BPH).

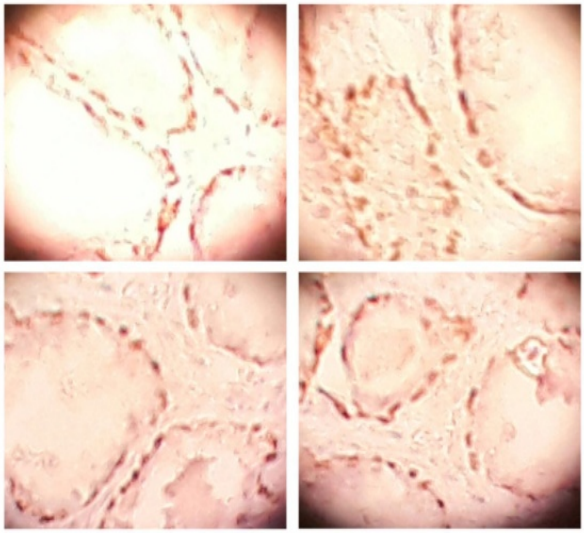

Figure 2: P63: expression of P63 which expressed by basal cell and nuclear in reactionin benign prostatic hyperplasia (BPH)

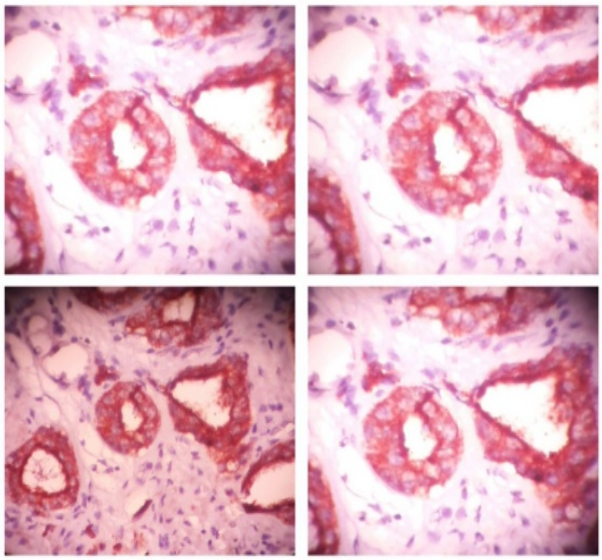

Figure 3: AMACR: expression of alpha methyl acyl coA racemace which are expressed as membranous in reaction mainly in adenocarcinoma of prostate.

Results and Discussions

In our study we found that 50 of total samples were benign prostatic hyperplasia and the other 50 were adenocarcinoma of prostatic tissue. 43 of 50 samples of BPH and 46 of 50 samples in adenocarcinoma were above the age 60. 33 of 50 samples of adenocarcinoma with G.S 4,6,7 each of them had 11 frequencies 12 of 50 samples had G.S 5, and 5 of 50 samples with G.S 8. Also we found 7,44 and 40 of 50 samples benign prostatic hyperplasia were positive in AMACR, P63 and HMWCK respectively, while 43, 6 and 10 in the

three markers respectively were negative. And 40, 5 and 8 of 50 samples adenocarcinoma were positive in AMACR, P63 and HMWCK respectively, while 10, 45 and 42 in the three markers respectively were negative. Finally when we compare G.S of Adenocarcinoma of prostatic tissue with AMACK, p63 and HMWCK expression we found in significant correlation with significant level (.670), (.670) and (.789)

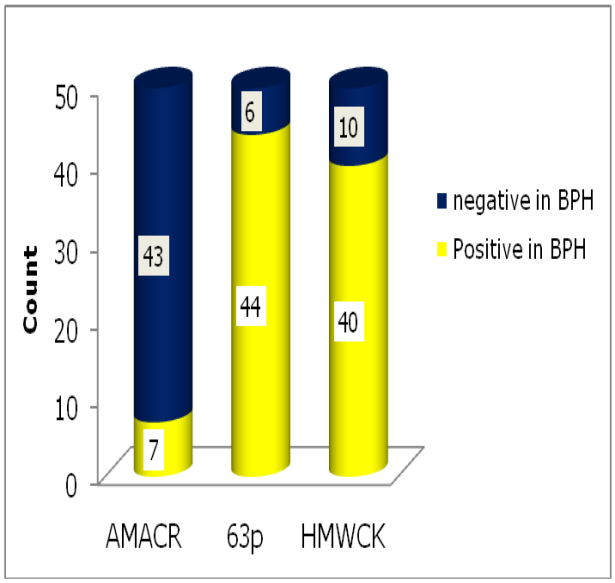

Figure 1:Expression of AMACR,P63 and HMWCK in BPH

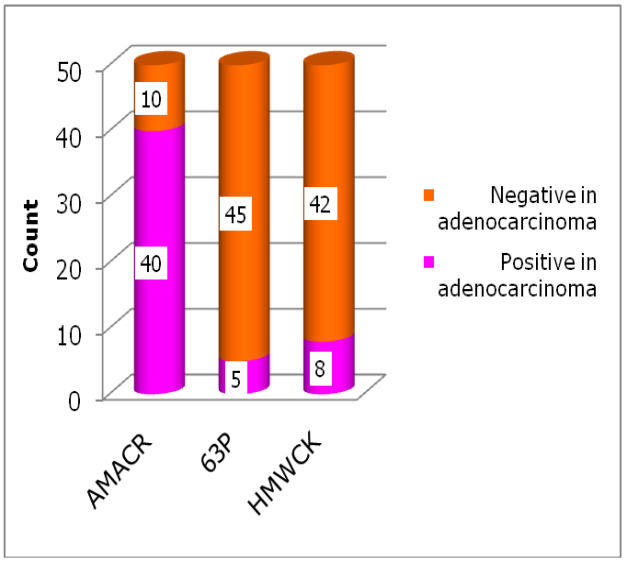

Figure 2: Expression of AMACR, P63 and HMWCK in Adenocarcinoma of prostatic tissue

Discussions:

Our finding agreement with (Anton and Matthias. 2008) who said as men increase in age, their risk of developing prostate cancer increases exponentially.

And (Kellogg et al. 2001) who said the vast majority of prostate adenocarcinomas do not express p63.

Also with (Gurmeen et al. 2013) who said of the 26 atypical or suspicious cases, 18 cases were positive for high molecular weight cytokeratin.

While (Ferdinandusse et al. 2000) said that 4% of histologically normal prostate epithelium was positive for AMACR, (96% was negative) and (Yang et al. 2002) find that all benign prostatic hyperplasia (20 of 20, 100%) were negative for P504S (AMACR).

Conclusions

1. Prostate cancer is the most common malignancy and the second leading cause of cancer-related deaths in men.
2. The application of immunohistochemistry to distinguish prostate cancer from benign mimickers and to confirm the diagnosis becomes helpful and necessary.
3. We have to use these three markers as panel(in combination) in routine diagnosis.
4. In this study we found the specifity of AMACR, HMWCK and P63 were 80%, 80% and 88% respectively, as we knowing from our finding AMACR is expressed in malignant while the basal cell marker(HMWCK and P63) are expressed in benign prostatic hyperplasia.

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