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ORIGINAL ARTICLE

Expression of Alpha Methyl Acyl-CoaRacemase (AMACR) Immunohistochemistry in Carcinoma Prostate in Tertiary Care Hospital

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ABSTRACT

Objective: Prostate needle biopsy samples from cancer patients at a tertiary care hospital were analysed for the presence of the potential screening indicator alpha-methylacyl-COA RACEMES.

Material and Methods: This was a Cross-sectional study carried out at Department of Histopathology, Lady Reading Hospital Peshawar from June, 2021 to December, 2021.Regardless of the patient's age, tumour grade, or histological type, all adenocarcinoma prostate specimens diagnosed at the Lady Reading Hospital Peshawar on the basis of immunohistochemistry and routine histology were examined. Standard and mean deviation were computed for quantitative factors of patient like age and frequencies, percentages were calculated for qualitative factors like AMACR expressions.

Results: Outof 90 cases, AMACR positivity was found in 68 (85%), while negativity was seen in 22 (15%). Nine (11.3%) of the negative cases had one staining (weak, non-circumferential) and three cases (3%) had no stainings (No cytoplasmic staining).

Conclusion: Positive AMACR staining on prostate needle core necropsies may be utilised to support a cancer diagnosis when the focus at issue is 1 mm in highest diameter. Basic hematoxylin and eosin standards for malice require analysis of cell-specific markers like P63 or 34E12. AMACR labelling must be interpreted in the context of other labels that can be used to find out more.

Keywords: Adenocarcinoma of the prostate, Alphamethylacyl-CoA racemase (AMACR), Immunohistochemistry.

INTRODUCTION

Prostate cancer with the expected 258,000 death cases out of 900,000 is the second most frequent malignancy among males globally (1). Accounting for roughly 7% of all malignant neoplasms in the male population, prostate cancer was discovered the 3rd most common melagnancy in males . 2011 (2).

Because 40-50 percent of people with minimal disease have moderately progressed or advanced carcinoma after final radical prostatectomy, it is critical to detect prostate cancer as soon as possible(3,4). As a result, under-diagnosis of a certain kind of prostate cancer may result in patients receiving delayed treatment and suffering significant consequences. By using a combination of cytological, and ancillary, and architectural criteria prostate cancer is diagnosed.Due to the presence of a multiple benigen mimickers of cancer , such as adenosis or a small concentration of cancer the diagnosis of accurate tissue maybe challenging (5).When it comes to diagnosing metastatic prostate cancer, there are certain limitations to basal cell immunohistochemical stains such as high-molecular-weight cytokeratin (HMWCK) or more recently, p63 (6,7). Basal cell markers do not rule out cancer as a possibility, even if they are missing. Immunohistochemistry markers could be helpful in improving the level of confidence needed to make a sure malignant diagnosis (6,7), so finding one would be particularly important.

cDNA expression microarrays found that in prostate tumours, the cytoplasm enzymatic alpha-methylacyl-COA racemase (AMACR), also referred to as p504s, is overexpressed but hardly detectable or very faintly expressed in benign glands, cDNA expression microarrays found (4,8). In Western nations, AMACR has been shown to be a high predictive marker for prostate cancer, but there is no confirmation of its utility in Pakistani populations. AMACR tests for prostate cancer and noncancerous glands are said to be less sensitive and specific than they were thought to be in western countries.Yamada et al. (6,7,9).Prostate smear test specimens from prostate cancer patients were examined in this research to assess how frequently the affirmative prognostic marker AMACR was expressed.

MATERIALS AND METHODS

At Lady Reading Hospital, Peshawar from June, 2021 to December, 2021 a cross-sectional study was conducted in which 90 cases were included. All adenocarcinoma prostate specimens detected by standard histology and immunohistochemistry were included using a nonprobability, consecutive sampling strategy, independent of patient age, histological type, or tumour grade. The biopsies that are in adequate were removed from the investigation. The epoch and histology analysis of the patient were noted. The immunohistochemistry data was viewed under a microscope and certified by a single expert to avoid observer bias.No cytoplasmic staining for AMACR expression was given a score of 0 and was considered negative. Staining was regarded as negative if it is non-

confrontial,weak and received a score of 1, whereas strong circumferential staining was viewed as positive if it received a total score of 2. (Yang et al., 2002). For age, descriptive data such as frequency was determined. The SPSS version 22 was used to analyse the data.

RESULTS

The AFIP database yielded a total of 90 instances. Thecases distribution across age groups is shown in Table 1. The affected role were on average about 67 years old and about 9 years old (Range between 54-82 years). The bulk of the patients were in their sixties seventies, with the fifth and eighth decades following closely behind (Table I). AMACR was found to be positive in 68 (85%) of 90 adenocarcinoma prostate cases, whereas 22 (15%) were negative. Among the instances that were negative (No cytoplasmic staining), 9 (11.3%) exhibited one signal (weak, non- circumferential) and 3 (3.8%) showed no staining (Table 2).

Table-1: Age and intensity of AMACR staining score

Intensity Score	Age			Total
	50-60	61-70	71-85	
0	0	2	1	3
1	2	2	5	9
2	23	28	17	68
Frequency	25	31	27	80
Percentage	31.2	41	29	100

Table-2: Result and intensity of AMACR staining score

Result	Intensity of AMACR Staining Score			Total
	0	1	2	
Negative Positive	3	9	0	12
	0	0	68	68
Total	3	9	68	80

DISCUSSION

The top cause of cancer-related death in males in Western countries, with a similar rate in the subcontinent, is prostate cancer. It is one of the most frequent malignancies globally.The fact that prostate cancer alone claimed the lives of 258,000 people in 2008 indicates how common it is (9,10).

For males residing in the United States, the lifetime risk of prostate cancer is now estimated to be one in six (7,9,14,15). 5.3 per 100,000 person-years adjusted for age is the prevalence rate of prostate cancer in Pakistan, and the number of cases has increased in recent years. Magi-Galluzzi and his colleagues (9,13). A man's lifetime risk of developing prostate cancer is one in 84.

As a result of the widespread use of PSA as a screening tool for prostate cancer, the number of prostate needle biopsies has grown, and radical prostatectomy has shown slightly developed or advanced carcinoma in 40–50% of individuals with only mild illness.

Kumaresan and colleagues (2010)As a result, misdiagnosing a localised focus of prostatic adenocarcinoma puts people at risk of delaying treatment and experiencing disastrous outcomes (12,13). A mix of architectural, cytological, and ancillary features is used to diagnose prostate cancer. Due to the existence of many benign mimickers of malignancy or a limited cancer focus, such as adenosis proprer tissue identification may be challenging . Yang and colleagues (8,14).

The diagnosis of focal prostate cancer relies on negative staining for basal cell markers such as HMWCK or, more recently, p63. However, this method has restrictions because hurtful staining for pre-cancerous indicators is not detectable of melanoma on its own, and these blotches may be falsely positive for technical reasons. It can be hard to understand negative staining in an atypical spot when there is positive staining in nearby healthy glands, which can be confusing (13,15).

As a result, a positive immunohistochemistry marker particular for prostate cancer would be extremely helpful in boosting the level of certainty needed to make a conclusive malignant diagnosis.According to immunohistochemical techniques, AMACR, a cytoplasmic enzyme, is over-expressed in most prostate adenocarcinomas and in HGPIN. In benign glands, however, it is usually undetectable or just very faintly expressed. The AMACR stain has been regarded as a key predictive biomarker for prostate cancer in Developed nations, despite its lack of usefulness in the Pakistani population. The AMACR's sensitivity and specificity for diagnosing tumour and benign glands in Japanese patients were recently shown to be lower than those reported earlier in western nations. Yamada et al. (13,15). It was determined that 70.6 percent of Japanese people have it, contrasted to 95 percent of Westerners (11,15).

CONCLUSION

When the focus in issue is less than 1 mm in maximum dimension, positive staining for AMACR/P504S may be provided to improve a diagnosis of cancer in prostate needle core biopsies. The findings of AMACR development in a Peshawar community are consistent with those from western studies. Basic hematoxylin and eosin cancer criteria, as well as the amplification of other supporting indicators such as 34E12 or p63, must be considered when evaluating the results of AMACR staining.

Conflict of Interest: There are no authors in this work who have disclosed a conflict of interest.

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