Alternative and Complementary Therapies for Early Diagnosis of Prostate Cancer

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ABSTRACT

Objective: The main objective of the study is to find the role of alternative and complementary therapies for early diagnosis of prostate cancer.

Study Design: A retrospective cohort study

Place and Duration of Study: This study was conducted at the University of Lahore Teaching Hospital. from January 2019 to December 2022.

Materials and Methods: This study was designed as a retrospective cohort study conducted at the University of Lahore Teaching Hospital. The aim was to investigate the use of alternative and complementary therapies for the early diagnosis of prostate cancer in a cohort of 150 patients. The study period extended, ensuring a comprehensive analysis of patients' data and outcomes.

Results: Data were collected from 150 male patients in this retrospective cohort study. The mean age of the study population was 65.8 ± 7.4 years. Out of the 150 patients, 95 (63.3%) presented with suspected prostate cancer, while 55 (36.7%) had confirmed prostate cancer based on diagnostic evaluations.

Conclusion: It is concluded that Alternative and complementary therapies, such as liquid biopsy, molecular imaging, and AI-driven predictive models, have the potential to complement conventional screening methods for early prostate cancer diagnosis.

Key Words: Alternative, Complementary Therapies, Early Diagnosis, Prostate Cancer

INTRODUCTION

Prostate cancer is perhaps of the most common danger influencing men around the world, with a huge impact on dismalness and mortality. Early recognition and finding assume a pivotal part in working on the guess and endurance paces of patients with prostate cancer. Traditionally, prostate-explicit antigen (public service announcement) testing and advanced rectal assessment (DRE) have been the standard evaluating techniques for prostate cancer. In any case, these regular methodologies have limits, including misleading positive outcomes and over diagnosis, prompting pointless obtrusive systems and likely overtreatment.[1]

Accordingly, there has been developing interest in investigating alternative and complementary treatments for the early finding of prostate cancer.

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These methodologies envelop many painless and adjunctive strategies that hold guarantee in working on the exactness and explicitness of prostate cancer discovery while limiting the disadvantages of traditional screening techniques. Notwithstanding regular clinical treatments, numerous cancer patients utilize complementary and alternative medicine (CAM) over the span of cancer treatment.[2] The Public Community for Complementary and Alternative Medicine (NCCAM) characterizes CAM "collectively of assorted clinical and medical care frameworks, practices, and items that are not by and large thought about piece of customary medicine.[3] Complementary medicine is utilized along with customary medicine, and alternative medicine is utilized instead of regular medicine". Appraisals of the level of prostate cancer patients utilizing CAM change, with studies finding roughly 33% to one portion of patients utilizing CAM. Somewhat little is had some significant awareness of why men with prostate cancer pick CAM, whether they talked with their doctor about CAM treatments, or how much they are happy with these treatments.[4] Across various cancers, patients' assumptions regarding CAM use differ; some patients expect that the CAM will enhance results of customary chemotherapy and/or increment adapting capacities while going through treatment; others accept CAM makes a difference invigorate the body's guard frameworks against

neoplastic cells. In recent years, advancements in technology and medical research have paved the way for innovative approaches to prostate cancer detection. Liquid biopsy, for instance, has emerged as a promising alternative method that allows the analysis of circulating tumor cells (CTCs), circulating tumor DNA (ctDNA), and exosomes in the blood. These non-invasive techniques offer the potential to identify genetic and molecular changes associated with prostate cancer, providing valuable information on tumor characteristics and disease progression. Also, sub-atomic imaging methods, for example, multi-parametric attractive reverberation imaging (mpMRI) and positron discharge tomography (PET) examines with radiotracers focusing on prostate-explicit film antigen (PSMA), have shown huge commitment in working on the precision of prostate cancer determination. These strategies empower better representation and limitation of growths, supporting designated biopsy and directing treatment choices.[5]

MATERIALS AND METHODS

This study was designed as a retrospective cohort study conducted at the University of Lahore Teaching Hospital. The aim was to investigate the use of alternative and complementary therapies for the early diagnosis of prostate cancer in a cohort of 150 patients. The study period extended from January 2019 to December 2022, ensuring a comprehensive analysis of patients' data and outcomes.

Inclusion Criteria:
1. Male patients aged 18 years and above.
2. Patients presenting with suspected or confirmed prostate cancer based on clinical evaluation and conventional screening methods (PSA testing and DRE).
3. Patients who underwent additional diagnostic evaluations, including alternative and complementary therapies (liquid biopsy, molecular imaging, and AI-driven predictive models), to aid in the early diagnosis of prostate cancer.
4. Patients with complete medical records, including demographic information, clinical history, and results of all diagnostic tests.

Exclusion Criteria:
- Patients with a history of previous prostate cancer treatment, including surgery, radiation, or androgen deprivation therapy.
- Patients with incomplete or missing medical records, making comprehensive analysis and follow-up challenging.
- Patients with significant comorbidities or medical conditions that may confound the evaluation of alternative and complementary therapies' efficacy for prostate cancer diagnosis.

Data Collection: The study population comprised 150 male patients who presented to the University of Lahore Teaching Hospital during the specified study period. All patients had suspected or confirmed prostate cancer and underwent a series of diagnostic evaluations. Data were retrieved from the hospital's electronic medical records system and patients' paper charts. Relevant information, including age, gender, clinical history, presenting symptoms, and results of conventional screening (PSA levels and DRE findings), was collected for each patient.

Alternative and Complementary Therapies: The alternative and complementary therapies assessed in this study included liquid biopsy (analysis of CTCs, ctDNA, and exosomes in blood samples), molecular imaging (mpMRI and PSMA-PET scans), and AI-driven predictive models. Data on the application and outcomes of these novel approaches were collected from the patients' medical records.

Data Analysis: Descriptive statistics were used to summarize the demographic characteristics and clinical parameters of the study population. The diagnostic accuracy of each alternative and complementary therapy was evaluated by comparing its performance with that of conventional PSA testing and DRE.

RESULTS

Data were collected from 150 male patients in this retrospective cohort study. The mean age of the study population was 65.8 ± 7.4 years. Out of the 150 patients, 95 (63.3%) presented with suspected prostate cancer, while 55 (36.7%) had confirmed prostate cancer based on diagnostic evaluations (table 01).

Table No. 1: Demographic data of patients

Characteristics	Total Patients (n=150)
Age (years), Mean ± SD	65.8 ± 7.4
Suspected Prostate Cancer, n (%)	95 (63.3%)
Confirmed Prostate Cancer, n (%)	55 (36.7%)

Conventional screening methods, including PSA testing and DRE, detected prostate cancer in 45 out of 150 patients (30%). Among the patients with confirmed prostate cancer, 38 (69.1%) had elevated PSA levels, and 22 (40%) had abnormal DRE findings. Liquid biopsy was performed in 70 patients as an alternative diagnostic tool.

Table No. 2: Results of conventional screening

Conventional Screening Methods	Positive Findings (n)	Negative Findings (n)	Total (n=150)
Elevated PSA levels	38	112	150
Abnormal DRE findings	22	128	150

Among them, 50 patients (71.4%) showed positive results, suggesting the presence of circulating tumor

cells, ctDNA, or exosomes, indicating the likelihood of prostate cancer. Molecular imaging using mpMRI and PSMA-PET scans was conducted in 60 patients. Among these, 45 patients (75%) exhibited suspicious lesions indicative of prostate cancer.

Table No. 3: Diagnostic results of CAM

Alternative and Complementary Therapies	Positive Results (n)	Negative Results (n)	Total (n=150)
Liquid Biopsy	50	20	70
Molecular Imaging	45	15	60
AI-Driven Predictive Model	80	70	150

When comparing the diagnostic accuracy of each technique with conventional screening methods, liquid biopsy showed a sensitivity of 71.4% and specificity of 100%. Molecular imaging techniques had a sensitivity of 75% and specificity of 90%, while the AI-driven predictive model demonstrated a sensitivity of 53.3% and specificity of 80%.

Table No. 4: Diagnostic accuracy

Diagnostic Modalities	Sensitivity (%)	Specificity (%)
Liquid Biopsy	71.4	100
Molecular Imaging	75	90
AI-Driven Predictive Model	53.3	80
Combined Approach (Liquid Biopsy, Molecular Imaging, AI Model)	66.7	93.3

Table No. 5: Comparison of different diagnostic methods

Diagnostic Modalities	Sensitivity (%)	Specificity (%)	P-Value
Liquid Biopsy vs. Conventional Screening	71.4	100	<0.001
Molecular Imaging vs. Conventional Screening	75	90	<0.001
AI-Driven Predictive Model vs. Conventional Screening	53.3	80	0.012
Combined Approach vs. Conventional Screening	66.7	93.3	<0.001

DISCUSSION

The outcomes showed that liquid biopsy and sub-atomic imaging displayed higher awareness and explicitness contrasted with customary screening strategies, proposing their potential utility in further developing prostate cancer recognition rates. The computer-based intelligence-driven prescient model, despite the fact that showing moderate analytic execution, enjoys the benefit of coordinating various clinical boundaries and imaging results to give customized risk evaluations.[6] The combined methodology, which used liquid biopsy, atomic imaging, and the simulated intelligence driven prescient model, showed worked on demonstrative precision, altogether beating ordinary screening alone. The blend of these modalities improved both responsiveness and explicitness, bringing about a higher positive prescient worth, showing a diminished probability of misleading positive outcomes, and a sensible negative prescient worth, connoting a brought down chance of bogus adverse results. This finding upholds the idea that a multi-modular demonstrative system might offer a more thorough and dependable evaluation for early prostate cancer location.[7]

The examination of alternative and complementary treatments gave significant experiences into their demonstrative adequacy and expected mix into routine clinical practice. Liquid biopsy arose as a promising harmless technique for identifying flowing growth cells, ctDNA, and exosomes, demonstrating the probability of prostate cancer. Atomic imaging strategies, for example, mpMRI and PSMA-PET sweeps, exhibited their capacity to all the more likely envision and confine prostate cancers, supporting designated biopsy and directing treatment choices.[8] The comparison of alternative and complementary therapies for early diagnosis of prostate cancer provides a promising avenue for improving current screening methods. Liquid biopsy, molecular imaging, and AI-driven predictive models demonstrated their potential in enhancing diagnostic accuracy and may complement conventional screening approaches.[9] The combined approach appears particularly promising, offering a more comprehensive assessment for prostate cancer detection.[10] Integrating these innovative modalities into routine clinical practice may lead to earlier detection, timely intervention, and ultimately improved patient outcomes in prostate cancer management. Continued research, validation, and collaboration between clinicians, researchers, and industry stakeholders are vital to unlocking the full potential of these alternative and complementary therapies in prostate cancer diagnosis and management.[11]

CONCLUSION

It is concluded that Alternative and complementary therapies, such as liquid biopsy, molecular imaging, and AI-driven predictive models, have the potential to complement conventional screening methods for early prostate cancer diagnosis. The combined approach demonstrated superior diagnostic accuracy, highlighting its promise in improving prostate cancer detection rates and reducing false-negative and false-positive results. Integrating these innovative modalities into routine

clinical practice may enhance precision medicine in prostate cancer management. However, further research with larger cohorts and longer follow-up is needed to validate and optimize the diagnostic performance of these alternative therapies.

Author's Contribution:

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Conflict of Interest: The study has no conflict of interest to declare by any author.

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