Applicant Information

Applicant Name	Applicant Email	Affiliation	Country
Dr FRANK OBENG	fobeng@uhas.edu.gh	UNIVERSITY OF HEALTH AND ALLIED SCIENCES, HO	Ghana

Abstract Details

Title:

Predicting Bone Metastasis in Prostate Cancer Patients Using Total Serum Prostate-Specific Antigen (PSA) and Serum Alkaline Phosphatase (ALP): A Study at the Korle-Bu Teaching Hospital, Accra

Category:

Non-communicable diseases including mental health

Authors:

Frank Obeng1, Nii-Boye HammondÂ², Alfred YawsonÂ³, J. E. MensahÂ² 1. University for Health and Allied Sciences, Ho 2. Korle-Bu Teaching Hospital, Accra 3. University of Ghana School of Public Health, Korle-Bu, Accra E-Mail Addresses of the Authors: Dr. Frank Obeng: fobeng@uhas.edu.gh Dr. Nii-Boye Hammond: nii-boye.hammond@gmail.com Prof. Alfred Yawson: alfred.yawson@gmail.com Prof. J. E. Mensah: je.mensah@gmail.com

Objectives:

This study addresses the global controversy over routine bone scans for newly diagnosed prostate cancer patients, focusing on the Ghanaian population. It aims to assess the predictive value of Prostate Specific Antigen (PSA) for bone metastasis and the role of serum alkaline phosphatase (ALP) in enhancing prediction.

Method:

Conducted at Korle-Bu Teaching Hospital over 10 months, this longitudinal cohort study involved 258 treatment-naÃ¯ve prostate cancer patients. Clinical evaluation, PSA and ALP tests, and bone scans were performed. Statistical analyses, including Chi-square and T-tests, identified significant predictors of bone metastasis.

Results:

PSA and ALP exhibited strong independent associations with bone metastasis, with PSA outperforming other predictors (AUC under ROC curve of 86.4%). A PSA cutoff of 15.63 ng/mL or an ALP cutoff of 57.58 IU/L, individually, detected 97.5% of bone metastasis. Combining PSA and ALP proved superior (99% detection rate). ALP excelled in predicting the metastatic pattern, especially at higher values. A PSA above 20 ng/mL, DRE >T2c, and Gleason score >7 predicted 95% of bone metastasis. Innovative Contribution: Clinicians can order a bone scan with a PSA cut-off of 15.63ng/ml. ALP best predicts bone metastasis patterns.

Conclusion:

For high-risk disease per D'Amico stratification, bone scans are advisable. Adopting a PSA cutoff of 15.63 ng/mL can exclude 20% of clients from unnecessary bone scans while missing only 2.5% of bone metastasis. This translates into 130 USD of financial savings per client and 55,354 USD of national savings per-anum. ALP enhances prediction but may not serve as a follow-up marker.

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