Contribution ID: **87** Type: **not specified**

Automated Bone Scan Index (aBSI) as an Imaging Biomarker in Castration Sensitive Metastatic Prostate Cancer in a novel clinical trial with Radium-223 and External Beam Radiotherapy

BACKGROUND
The majority (~90%) of patients with metastatic prostate cancer will have multiple bony metastases. Despite being the most common area of metastases in prostate cancer, reliably evaluating the burden of bony metastases at baseline and monitoring response to different therapeutic interventions is challenging and not standardised.

Isotope Bone Scan (IBS) is the most widely utilised imaging modality in staging and initial management decisions in prostate cancer. Presently, the standard interpretation of IBS relies on subjective assessment of the number and geographical distribution of metastases.

Automated Bone Scan Index (aBSI) is a quantitative analysis of IBS reflecting the extension of tumour burden in bone as present of the total skeleton weight calculated from IBS. This method allows a standardised approach to comparing distribution of bony metastatic disease.

Figure 1. Schematic of aBSI methodology

OBJECTIVE
The objective of this study was to evaluate aBSI as an Imaging Biomarker in Metastatic Castration Sensitive Prostate Cancer (mCSPC) in a novel clinical trial with Radium-223 (Ra-223) and External Beam Radiotherapy (EBRT).

METHODS
We present preliminary data from a Phase II trial exploring the use of six cycles of Ra-223 in combination with prostate and pelvic EBRT post-docetaxel in mCSPC (>3 bone metastases, no lymph node or visceral disease T4N0/1M1b). Fifteen of twenty-eight patients enrolled in the trial had baseline and treatment follow-up IBS available for aBSI analysis. The EXINI aBSI software programmed was used to retrospectively analyse the IBS and generate the aBSI value. Alkaline phosphatase (ALP) and Prostate Specific Antigen (PSA) values were collected.

RESULTS
All patients had a reduction or stability in the aBSI reading except one patient had progression disease. There was a median reduction of 71.5% (-350-88.9%) in the aBSI with a number of patients having almost complete resolution of quantifiable disease on IBS as evidenced in Figure 2. All patients had a reduction in ALP from Cycle 1 to Cycle 6 with treatment, median reduction from Cycle 1 90 (65-236U/L) to Cycle 6 59 (37-165U/L). Over a median follow up period of 25.9 months the median overall survival and progression free survival have not yet been reached. Two-thirds of the patients in this study have prolonged reductions in aBSI in excess of 2 years post-commencement of LHRHa.

Figure 2. An illustrative example of aBSI change over the course of treatment on IBS (baseline and follow-up scans) MRI scans also shown depicting response.

CONCLUSION
We present the first documented use of aBSI in mCSPC treated with Ra-223. This tool may improve analysis of response to bone metastases in the metastatic setting. It may reduce risk of reporter bias and can be used to systematically follow up patients with multiple therapeutic interventions in this patient cohort. Sequential whole-body MRI's are available for comparison and will be evaluated on completion of this novel clinical trial. The use of aBSI in conjunction with ALP and PSA may help prognosticate response in mCSPC.

Funding Agency

royal embassy of saudi arabia cultural bureau

Email Address

a.alila.a@hotmail.com

Presentation Type

Poster

Primary author: Mr ALSHEHRI, Ali (Queen's University Belfast)

Co-authors: Mr SANDRA, Biggart (Northern Ireland Cancer Centre- Belfast Health and Social Care Trust, Nuclear Medicine Department, Belfast, United Kingdom.); Mr CAOIMHGHIN, Campfield (Northern Ireland Cancer Centre- Belfast Health and Social Care Trust, Nuclear Medicine Department, Belfast, United Kingdom.); Mr CHRISTOS, Chatzigiannis (Northern Ireland Cancer Centre- Belfast Health and Social Care Trust, Nuclear Medicine Department, Belfast, United Kingdom.); Dr AIDAN, Cole (Northern Ireland Cancer Centre- Belfast Health and Social Care Trust, Oncology, Belfast, United Kingdom.); Dr SUNEIL, Jain (Northern Ireland Cancer Centre- Belfast Health and Social Care Trust, Oncology, Belfast, United Kingdom.); Prof. JOE, O'Sullivan (Northern Ireland Cancer Centre- Belfast Health and Social Care Trust, Oncology, Belfast, United Kingdom.); Prof. KEVIN, Prise (Centre for Cancer Research and Cell Biology- Queen's University Belfast, Cancer Research and Cell Biology, Belfast, United Kingdom.); Dr PHILIP, Turner (Northern Ireland Cancer Centre- Belfast Health and Social Care Trust, Oncology, Belfast, United Kingdom.)

Presenter: Mr ALSHEHRI, Ali (Queen's University Belfast)