Research Article

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ASSESSMENT OF OSTEOPOROSIS IN PATIENTS WITH PROSTATE CANCER USING COMPUTED RADIOGRAPHY

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ABSTRACT

In this paper we assessment of osteoporosis in patients with prostate cancer using computed radiography, the Bone metastases are a common cause of morbidity in patients with prostate carcinoma. Imaging bone metastases from prostate cancer presents several challenges. The lesions are usually sclerotic and appear late on the conventional X-ray. patient's osteoporosis with prostate cancer imaging with x.ray and the images analysing by Interactive Data Language IDL software version 6.1 to measure the grey level variation of x.ray images with spine and hip examinations, data was available for 200 patients with x.ray hip and spine examinations , 100 normal and 100 osteoporosis patients with hip and spine x.ray. The results show that the mean of up normal and normal CR for hip regions was 2526.43 ± 310.63 and 619.67 ± 86.39, and for normal and up normal CR spine the mean was 1988 ± 592.44 and 598.77 ± 73.44. and by using T.Test show that there is significant difference between normal and up normal CR for hip regions. and between normal and up normal CR spine. Linear regression results show that the rate of change between normal and up normal hip decreasing, and same for normal and up normal CR spine. Conclusion: there is significant difference between normal and up normal CR for hip regions, and between normal and up normal CR spine, and the rate of change between normal and up normal hip decreasing, for normal and up normal CR spine.

KEYWORDS: Osteoporosis, prostate cancer, Computed Radiography.

INTRODUCTION

Prostate carcinoma is one of the most common cancers in men worldwide.[1,2] Bone is a preferred and sometimes the only, site for prostate cancer metastases, which occur in more than 80% of men with advanced prostate cancer.[3,4] In addition to bone metastases, bone loss resulting from previous orchiectomy or hormonal therapies that lower or block androgen activity may contribute to an increased risk of fracture, pain and other skeletal complications.[5–8] Complications from bone metastases are a major cause of morbidity in patients with prostate carcinoma, causing pain, spinal cord compression, pathologic fractures and abnormalities in serum calcium levels.[9]

There are several available methods for treatment of patients with PCa, such as active surveillance, resection, radiotherapy and androgen deprivation. Gonadotropin-releasing hormone analogs may be indicated as adjunctive therapy in the treatment of metastases or as the therapy of choice in biochemical recurrence of primary disease.[10]

From the age of 40 on, there is deterioration in bone health. Maternal family history of osteoporosis, smoking, diabetes mellitus, alcoholism and drug use. Although the risk to bone health is recognized, usually patients using GnRHaare not evaluated for osteoporosis. Often the bone mineral density (BMD) before the start of antiandrogenic therapy (ADT) is not performed and in many cases, analysis of bone health is performed only after a major adverse outcome (fracture) has occurred increase the risk of developing osteoporosis.[11-13] and bone loss resulting from previous orchiectomy or hormonal therapies that lower or block androgen activity may contribute to an increased risk of fracture, pain and other skeletal complications.[14-17] Complications from bone metastases are a major cause of morbidity in patients with prostate carcinoma, causing pain, spinal cord compression, pathologic fractures, and abnormalities in serum calcium levels.[18]

MATERIAL AND METHOD

The data collected from Radiation and Isotopes Center of Khartoum (RICK) and Antalyia Diagnostic Center, where 200 patients, used x.ray machines (philps and shemadzu), patients osteoporosis with prostate cancer imaging with spine and hip x.ray examinations analysing the image with Interactive Data Language IDL software version 6.1 to measure the grey level variation of images

with spine and hip area, data was available for 200 patients with x.ray hip and spine examinations, 100 normal and 100 osteoporosis patients with hip and spine x.ray.

And the collected variables: age, Body Mass Index, weight, height and bone scan image. x.ray, PSA and period of starting hormone therapy.

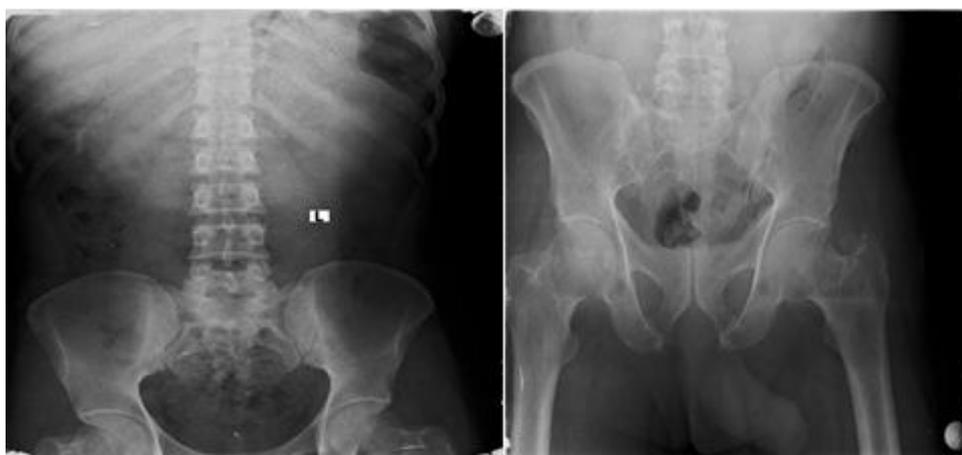**Fig: 1 Show x.ray images for up normal hip and spine**

Fig: 2 Show x.ray images for normal hip and spine

RESULTS AND DISCUSSION

Table: 1 show statistical parameters for all patients

	Mean	Median	SD	Min	Max
Age	**69.43**	**70.5**	**10.52**	**45**	**89**
Period of Treatment	2.41	2	1.28	1	7
High	169.9	169.5	8.34	149	192
Weight	75.33	74	12.25	42	114
PSA	5.36	5.30	2.33	0.02	10.4
BMI	25.96	26.35	3.46	15.43	33.49
Up normal CR Hip	2526.43	2505.5	310.63	1978	3197
Up normal CR Spine	1988	1926	592.44	1245	3184
Normal CR Hip	619.67	618.5	86.39	440	760
Normal CR Spine	598.77	599	73.34	417	711

Table: 2. show paired sample for all images

Paired Samples Statistics		Mean	Std. Deviation
Pair 1	Up normal Hip CR	2526.43	310.63
	Normal Hip CR	619.67	86.39
Pair 2	Up normal Spine CR	1988	592.44
	Up normal Spine CR	598.77	73.34

Table: 3. show T.Test for equality of means CR normal and up normal images

		t-test for Equality of Means	
		t	P.value
Hip CR	Equal variances assumed	32.392	.000
	Equal variances not assumed	32.392	.000
Spine CR	Equal variances assumed	12.747	.000
	Equal variances not assumed	12.747	.000
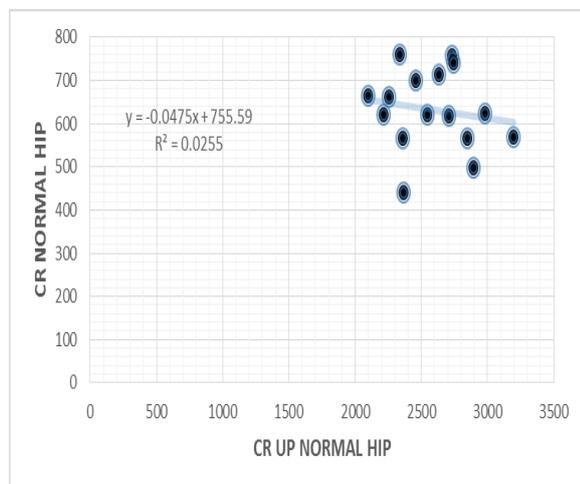
Figure: 3 show correlation between CR normal and up normal hip images
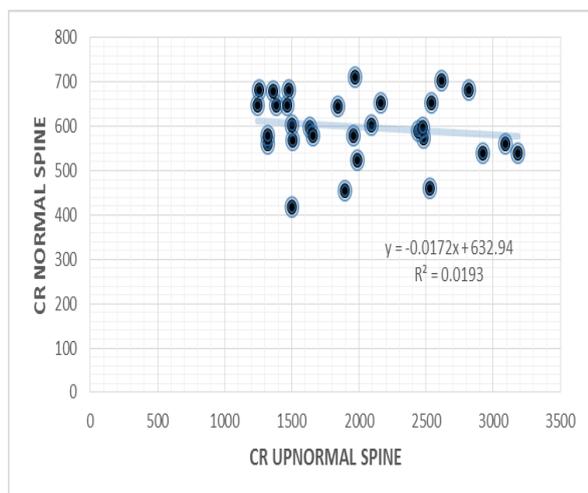
Figure 4. show correlation between CR normal and up normal spine images

DISCUSSIONS
Assessment of osteoporosis in patients with prostate cancer using computed radiography for 200 patients (100 Normal and 100 Up normal patients) and we using statistical parameters to show the data, for age the mean±SD was 69.43±10.52 and for weight, high, body mass index and PSA 75.33±12.25, 169.9±8.34, 25.96.3.46 and 5.36±2.33 respectively, **table 1** . And the values for images measurement the mean for Up normal CR for hip regions 2526.67±310.63, Up normal CR spine 1988±592.44, for Normal CR hip 619.67±86.39, Normal CR spine 598.77±73.34 **table 1.**

The mean of up normal and normal CR for hip regions was 2526.43±310.63 and 619.67±86.39, and for normal and up normal CR spine the mean was 1988±592.44 and 598.77±73.44 **table 2.**

Using show T.Test for equality of means CR normal and up normal show that there is significant difference between normal and up normal CR for hip regions **table 3.** And between normal and up normal CR spine **table 3.**

Linear regression results show that the rate of change between normal and up normal hip decreasing by 0.0475 versus one unit of up normal **fig 3.** and by rate of 0.0172 versus one unit of up normal CR spine **fig 4.**

CONCLUSION
Assessment of osteoporosis in patients with prostate cancer using Computed Radiography show that there is no significant difference between normal and up normal hip and spine regions.

And the Linear regression results in decreasing rate between normal CR hip and spine and up normal G.C for hip and spine, per one unit for normal CR versus up normal G.C spine. and estimated of *values between the normal and up normal* hip and spine calculated using the following linear equations:
CR normal hip   = - 0.0475 (up normal CR hip) +755.59
CR normal spine = - 0.0172 (up normal CR spine) + 632.94

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