

**VALUE OF BONE RESORPTION MARKERS TO PREDICT  
SKELETAL RELATED EVENTS AND RESPONSE TO  
BISPHOSPHONATE THERAPY IN PATIENTS WITH BONE  
METASTASES**

(A PROSPECTIVE RANDOMIZED STUDY)

THESIS

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BY

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## **ABSTRACT**

The prospective analysis of urinary N-telopeptides, collagen break down products type I (NTX), in patients with metastatic bone disease revealed a positive relation between NTX level and risk of Skeletal related events (SREs). Normalization of NTX level at 3 months decreases the rate of serious types of SREs (pathological fractures and cord compression). Zoledronic acid decreases the rate of one or more SREs by four times in patients with elevated NTX levels compared to no Zoledronic acid.

**Key words : metastatic bone disease; bone markers; N-telopeptides; NTX; Skeletal related event; SRE.**

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## **Results**

## Results

**Table (7) NTX level (nmol/mmolcr) according to origin of metastases**

NTX level	Breast	Prostate	Myeloma	P value
median	83	79	70	
minimum	14.5	19	14	
maximum	1904	300	300	0.27

Table 7.No statistical significance between the NTX level at baseline when sub-grouping the patients according to the origin of metastases (p=0.27).

**Table 8. Distribution of baseline pain score among the groups**

GROUPS					Total
BPI Score	A	B1	B2	C	
	No    %	No    %	No    %	No    %	
Mild        (0-5)	0	5        (25)	12   (44.4)	20   (66.7)	37
Moderate (6-9)	0	15       (75)	15   (55.6)	10   (33.3)	40
Severe      (10)	23   (100)	0	0	0	23
	23   (100)	20   (100)	27   (100)	30   (100)	100

## Results

**Table 9. Relationship between Pain score and Baseline NTX level**

NTX level (nmol/mmolcr)	Pain Score			Total no.	P value
	Mild (0-5)	Moderate (6-9)	Severe (10)		
≤ 50	18 (58%)	10 (32%)	0 (0%)	28	
51-100	13 (41%)	15 (47%)	4 (12%)	32	
>100	6 (15%)	15 (37%)	19 (48%)	40	
	37	40	23	100	<0.001*

\*Statistically significant correlation between level of NTX and pain score at baseline rs=0.451, p<0.001.

**Table 10. Distribution of percentages of 1<sup>st</sup> SREs among the groups**

Groups	No of cases	% SRE at 2yrs	Median months	P value
Total	100	53.2	20	
A	23	56.6	15	
B1	20	52.0	13	
B2	27	59.7	20	
C	30	46.6	36	0.120

## **Results**

**Table 11. Time to 1<sup>st</sup> SRE in relation to NTX levels**

NTX	No. of cases	% SRE at 2 yrs	Median months	P-value
<50 nmol/mmolcr	30	46.6	36	0.017
>50 nmol/mmolcr	70	55.3	20	

**Table 12 Percentage of 1<sup>st</sup> SRE in relation to ZOL**

Zometa	No. of cases	% SRE at 2yrs	Median month	P-value
No	57	53.0	20	0.154
Yes	43	54.8	15	

**Table 13. Percentage and time to SRE according to origin of disease**

Group	No. of cases	% SRE at 2 yrs	Median time to SRE	P value
Multiple myeloma	7	0	11	0.150
Breast cancer	76	52.9	27	
Prostate cancer	17	36.4	12	

## **Results**

**Table 14. Evaluable patients at 3 months with SRE**

Groups	Number of evaluable patients at 3 months*	Number of Patients with SRE throughout the study	No. of Patients with 1 <sup>st</sup> SRE at 3 months
A	21/23 (91%)	14/21 (67%)	8/21 (38%)
B1	16/20 (80%)	6 /16 (38%)	0/16 (0%)
B2	18/27 (67%)	9 /18 (50%)	4/18 (22%)
C	24/30 (80%)	10/24 (42%)	1/24 (4%)
total	79/100* (79%)	39/79 (49%)	12/79 (15%)

\* 8 patients were lost to follow up before months 3, 13 patients died at 3 months due to dominant visceral disease or progressive brain metastases.