Summary and Conclusion

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Increased bone turnover is a sequel of spinal cored injury (SCI) & predisposes to a number of clinically relevant complications, including osteoporosis & fractures. BMD measured by densitometry is the elective parameter for The diagnosis of osteoporosis & osteopenia . Biochemical markers of bone turnover have been propos as sensitive indicators of high bone turnover for monitoring response to antiresoptive treatment.

This study included 50 adult patients suffering from spinal cord injury they were 30 males and 20 females. The age of the patients ranged between 18 - 40 years. Also, ten healthy subjects who served as controls, they were 5 males and 5 females, their ages ranged between 18 and 42 years.

Thirty four patients have a complete spinal cord injury and 16 patients have a incomplete spinal cord injury. Thirty two patients have a high level of spinal cord injury (i.e. from the second cervical vertebra to the tenth thoracic vertebra) & 18 patients have a low level of spinal cord injury (i.e. from the eleventh thoracic vertebra to the first lumber vertebra). The duration of spinal cord injury ranged between 1 - 17 years.

Twenty eight patients have a duration of spinal cord injury more than 3 years & 22 patients have a duration of spinal cord injury less than or equal 3 years.

Our target of consideration in this study, is to determine and measure the bone mineral density, biochemical markers of bone turnover in individuals who has spinal cord injures and investigate the relationship between bone mineral density, biochemical markers of bone turnover and severity of the spinal cord injures, level at which the spinal cord injures occurs, and also the duration of the spinal cord injures. And investigate the relationship between bone mineral density and biochemical markers of bone turn over, investigate the relationship between the biochemical markers of bone formation (bone specific alkaline phosphates) and biochemical markers of bone resorpition (C- telopeptid), and also investigate the relationship between the bone mineral density in the lumber spine and the bone mineral density of the femoral neck.

The All patient's and controls will be subjects to the following:

1- Full clinical examination.

2- Examination of bone mineral density in spine and femoral neck by DEXA .

3- Biochemical markers of bone formation (bone specific alkaline phosphatase)

4- Biochemical markers of bone resorption (urinary C-telopeptid cros links).

5- Serum calcium & phosphorus.

6- Complete urine analysis & 24 hours urinary calcium.

7- Kidney functions test (i.e.;blood urea & serum creatinine).

8- Liver functions test (i.e; AST, ALT,Serum Albumin).

9- Complete blood picture.

Our results demonstrated the following :

- Age was insignificantly correlated with T score of BMD of the spine and femoral neck ($P>0.05$) .
- Age was insignificantly correlated with the bone specific alkaline phosphates ($P>0.05$). But significantly correlated with the C-telopeptid ($P<0.05$).
- Sex was insignificantly correlated with T score of BMD of the spine and femoral neck ($P>0.05$).
- Sex was insignificantly correlated with the bone specific alkaline phosphates & C-telopeptid ($P>0.05$).
- Complete lesion was highly significantly correlated with T score of BMD of the spine ($P<0.001$), while incomplete lesion was significantly correlated with T score of BMD of the spine ($P<0.05$), but complete and incomplete lesions was

insignificantly correlated with T score of BMD of the femoral neck (P>0.05).

- The type of lesion either complete or incomplete was insignificantly correlated with the bone specific alkaline phosphates & C-telopeptid (P>0.05).
- The level of lesion either high or low was significantly correlated with the T score of BMD of the spine and femoral neck (P<0.05) .
- The level of lesion either high or low was insignificantly correlated with the bone specific alkaline phosphates & C-telopeptid (P>0.05)
- The duration of the lesion either more or less than three years was insignificantly correlated with the T score of BMD of the spine and femoral neck (P>0.05) .
- The duration of the lesion either more or less than three years was significantly correlated with the both bone specific alkaline phosphates& C-telopeptid (P<0.05) .
- The T score of BMD of the spine and femoral neck was highly significant correlation with both with the bone specific alkaline phosphates & C-telopeptid (P<0.001) .
- Bone specific alkaline phosphates & C-telopeptid are highly significant correlation with each other (P<0.001) .

- The T score of BMD of the spine was highly significantly correlated with the T score of BMD of the femoral neck ($P<0.001$) .

In conclusion , we found that combined biochemical markers of bone turnover and BMD score provide better predication of fracture risk than BMD alone .

We recommended the use of biochemical markers of bone turnover combined with serial bone densitometry for accurate determination of change in bone mass in SCI patients.