ASSESSMENT OF CHANGES IN BONE MINERAL DENSITY BY USING DUAL ENERGY X-RAY ABSORPTIOMETRY SCAN AFTER BARIATRIC SURGERY: A PROSPECTIVE OBSERVATIONAL STUDY

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INTRODUCTION

- Bariatric surgery has proved to be the most effective therapy available for weight loss in morbid obesity to achieve majorlong-termm weight loss.
- It increase risk of fractures because these procedures may induce negative effect on bone metabolism, with increase in bone turnover and a decrease in bone mass leading to reduced bone mineral density.

AIM: To assess changes in the bone mineral density after bariatric surgery by using DEXA scan and correlate it with the level of serum calcium and Vit-D before and after bariatric surgery

METHODS

- A single center tertiary care hospital study from April 2019 to October 2022
- All the morbidly obese patients undergoing bariatric surgery were included
- Preoperative Bone mineral density was measured using DEXA scan(using Hologic Discovery QDR Series) and T score and Z score was calculated
- Biochemical analysis- Serum calcium & Vitamin D measurement
- Postoperative day 90, bone mineral density was again measured by DEXA Scan, and measurement of serum calcium level and serum vitamin D levels was done.
- All patients in study were supplemented with calcium tablets & vitamin D.
- Specific Vitamin D supplementation were given if less than 30ng/dl at 1 Lac IU of cholecalciferol once in 15 days x 2 months F/b every 3 months

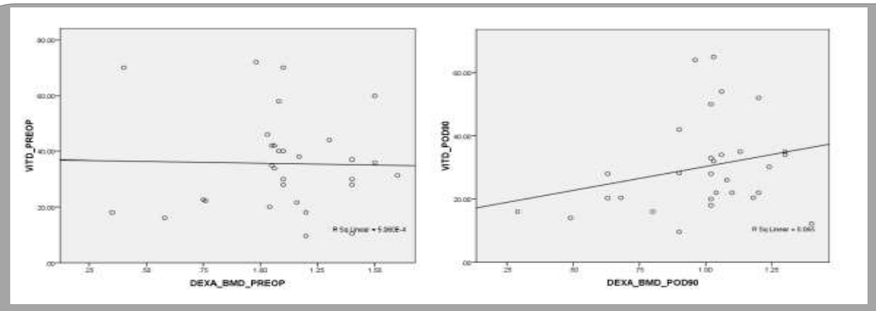
RESULTS

- Bariatric surgery lead to decrease in all the variables studied .
- On comparing the variables after the surgeries (Bypass and SG) the difference happened to be insignificant between two surgeries (p value for BMI, DEXA BMD, DEXA T -score, DEXA Z-score, serum Vitamin D and serum calcium was 0.544, 0.345, 0.648, 0.470 ,0.062 and 0.406 respectively).

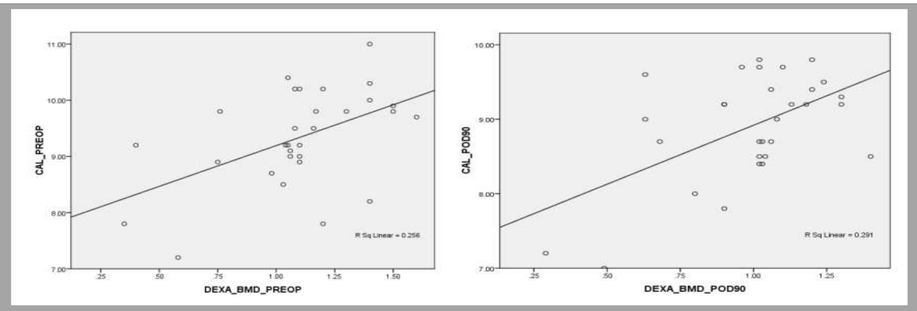
- After bariatric surgery there was decrease in mean BMI and mean BMD.
- Bariatric surgery leads to decrease in serum calcium level.
- Bariatric surgery leads to decrease in serum vitamin D levels.
- Decrease in mean BMI, BMD, serum calcium, and vitamin D level was more in mal-absorptive surgery (LMGB) as compared to restrictive surgery (LSG).
- Serum calcium and vitamin D supplementation did not affect the postoperative decrease in their levels.

PARAMETERS	Preoperative		Postoperative		Difference		P- value
	MGB(n-8)	SG(n-22)	MGB(n-8)	SG(n-22)	MGB(n-8)	SG(n-22)	
BMI	48.11±6.01	44.25±5.33	39.31±4.09	34.72±4.62	-8.80±2.29	-9.54±3.08	0.544
DEXA BMD	1.05±0.33	1.11±0.29	0.88±0.29	1.03±0.22	-0.17±0.18	-0.09±0.20	0.345
DEXA T-score	0.61±1.98	1.15±1.63	0.71±2.02	1.09±1.64	0.10±0.73	-0.05±0.84	0.648
DEXA Z -score	0.96±1.33	1.50±1.34	1.04±1.51	1.34±1.49	0.07±0.70	-0.15±0.77	0.470
S. Vitamin D	44.00±16.2	32.64±16.6	35.25±16.3	28.24±13.8	-8.75±7.09	-4.40±4.73	0.062
S. Calcium	9.12±0.67	9.41±0.92	8.80±0.76	8.94±0.72	-0.33±0.54	-0.47±0.38	0.406

Comparison of various parameters before and after bariatric surgery



Relation between DEXA BMD and serum Vit D (Pre & Post-op): Negative co-orelation in pre-op while positive in post-op period



Relation between DEXA BMD and Serum Calcium (Pre & Post-op): Positive co-orelation in pre-op & post-op period

CONCLUSION

- Every patient should be evaluated for fracture risk and treated based on the BMD levels suggesting osteopenia and osteoporosis.
- Decrease in BMD was more after mal-absorptive procedure
- Serum Calcium & Vit D supplements didnot effect post-operative decrease in levels