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ORIGINAL ARTICLE

Assessment of fracture incidence in patients with pregnancy and lactation osteoporosis

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ABSTRACT:
Background: Osteoporotic fractures in the third trimester of pregnancy or in the early postpartum period can occur in premenopausal women with pregnancy and lactation-related osteoporosis. The present study was conducted to assess fracture incidence in patients with pregnancy and lactation osteoporosis (PLO). **Materials & Methods:**128postpartum women with pregnancy and lactation osteoporosis (PLO) were enrolled. Parameters such as type of fracture bone involved and osteoporosis management given were recorded. **Results:** Location was lumbar vertebra in 10, lumbar spine and pelvis in 24, rib in 12, coccyx in 4, sacrumin 3, femur in 2, sternum and thorax in 15, and foot and toe in 6 patients. The difference was significant (P< 0.05). Treatments for osteoporosis wereCinacalcet in 10, Ibandronatein 15, Pamidronate in 21, Etidronate in 5, Alendronate in 7 and Denosumab in 8 patients. The difference was significant (P< 0.05). **Conclusion:** Maximum women with pregnancy and lactation osteoporosis had fractures of lumbar spine and pelvis, rib, and lumbar vertebra.
Keywords: Fractures, Osteoporosis, Pregnancy

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INTRODUCTION

Osteoporotic fractures in the third trimester of pregnancy or in the early postpartum period can occur in premenopausal women with pregnancy and lactation-related osteoporosis (PLO), a rare disease.[1] Although it is well-established that vertebral bodies are the most common location for fractures, the frequency of other fracture sites is unclear. Increased levels of parathyroid hormone-related peptide (PTHrP), which creates the maternal-fetal calcium gradient to permit calcium transfer to the fetus, are thought to be the cause of bone loss in this syndrome.[2] The underlying causes of osteoporosis disappear when lactation is stopped, and spontaneous recovery is anticipated. Usually, only the most severe cases are given treatment. Risk elements for the emergence ofPLO are not yet known.[3]

Low-trauma fractures can occur in certain patients due to pre-existing deficits in bone density with the additional mechanical and metabolic loads of pregnancy and lactation.[4] During a reproductive cycle, some women with apparently normal skeletons may also suffer a fracture. Breastfeeding causes a necessary decrease of skeletal strength and mineral content, which momentarily raises the risk of fractures.[5] Parity and breastfeeding have generally been proven to have a neutral or protective effect against the long-term development of osteoporosis or fragility fractures because after lactation, recovery of bone mass and strength normally occurs. The use of pharmaceutical therapy for osteoporosis that develops during pregnancy or lactation is a topic of much debate.[6]The present study was conducted to assess fracture incidence in patients with pregnancy and lactation osteoporosis (PLO).

MATERIALS & METHODS

The present study consisted of 128postpartumwomen with pregnancy and lactation osteoporosis (PLO). All gave their written consent to participate in the study.

Data such as name, age, etc. was recorded. A thorough examination such as clinical and radiological examination was carried out. Parameters such as type of fracture bone involved and osteoporosis management given were recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Type of fracture incidence

Location	Number	P value
Lumbar vertebra	10	0.04
lumbar spine and pelvis	24	

Rib	12	
Coccyx	4	
Sacrum	3	
femur	2	
Sternumand thorax	15	
foot and toe	6	

Table I, graph I show that location was lumbar vertebra in 10, lumbar spine and pelvis in 24, rib in 12, coccyx in 4, sacrum in 3, femur in 2, sternum and thorax in 15 and foot and toe in 6 patients. The difference was significant (P< 0.05).

Graph I Type of fracture

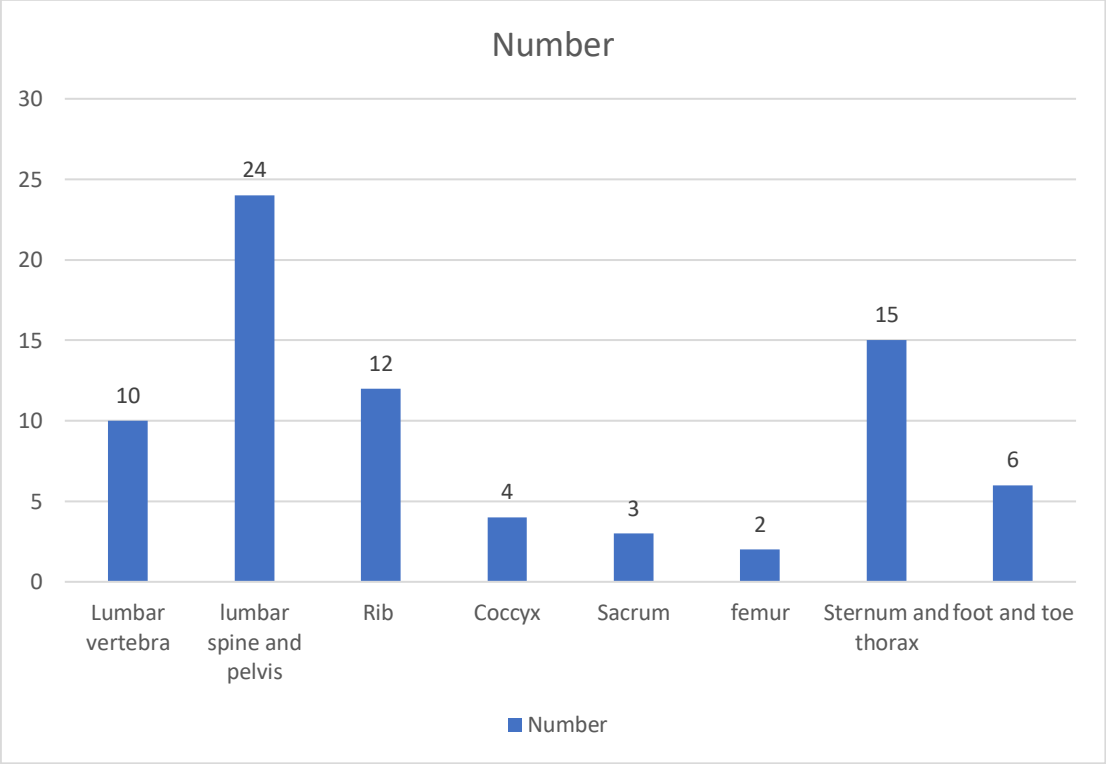
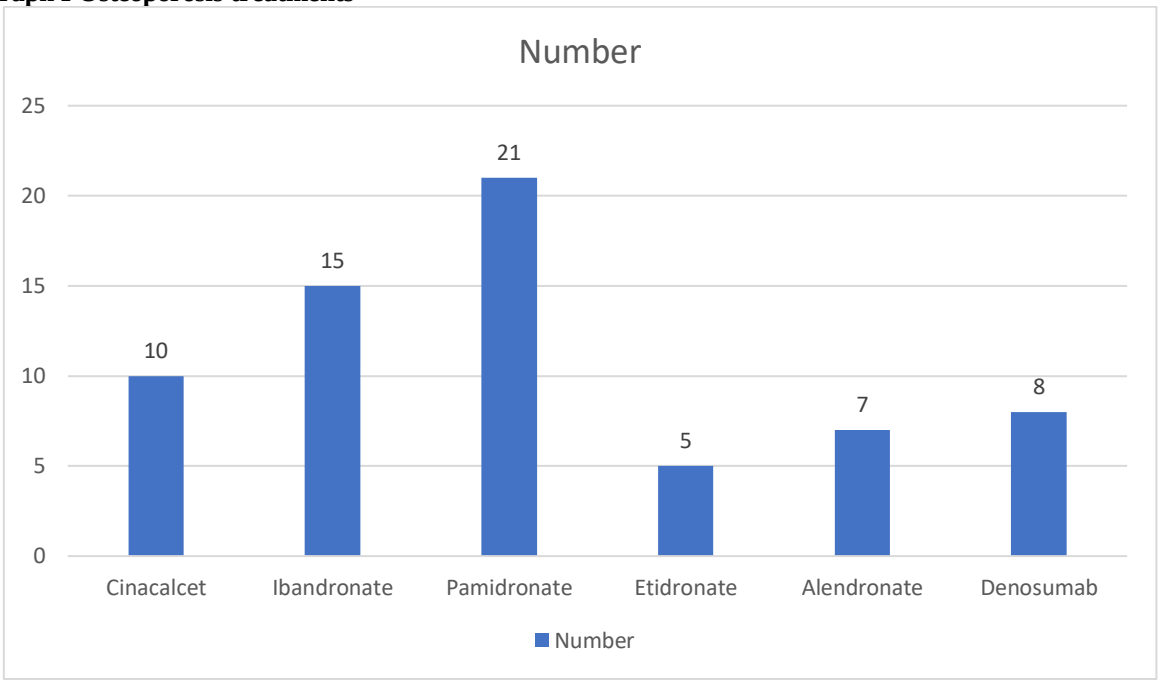


Table II Osteoporosis treatments

Treatment	Number	P value
Cinacalcet	10	0.74
Ibandronate	15	
Pamidronate	21	
Etidronate	5	
Alendronate	7	
Denosumab	8	

Table II, graph II show that treatments for osteoporosis was Cinacalcet in 10, Ibandronate in 15, Pamidronate in 21, Etidronate in 5, Alendronate in 7 and Denosumab in 8 patients. The difference was significant (P< 0.05).

Graph I Osteoporosis treatments



DISCUSSION

Osteoporosis is common in people aged 50 and over, but the disease can strike the younger age groups.[7] Osteoporotic fracture associated with pregnancy and breastfeeding is rare, so its treatment is not well understood, not to mention the natural course of treated osteoporotic fracture.[8] Pregnancy-induced osteoporosis was reported in 1955 for the first time.Parathyroid hormone-related protein (PTHrP) is likely to be responsible for osteoporotic fracture.[9,10]

We found that location was lumbar vertebra in 10, lumbar spine and pelvis in 24, rib in 12, coccyx in 4, sacrum in 3, femur in 2, sternum and thorax in 15 and foot and toe in 6 patients. Ettinger et al[11]assigned 670 women in their first trimester of pregnancy to 1,200 mg/day calcium (N = 334) or placebo (N = 336). Subjects were followed through 1-month postpartum and the effect on urinary cross-linked N-telopeptides (NTx) of type I collagen, a specific marker of bone resorption, was evaluated using an intent-to-treat analysis. Calcium was associated with an overall reduction of 15.8% in urinary NTx relative to placebo. Among those who consumed ≥50%, ≥67%, and ≥75% of pills, respectively, the effect was associated with 17.3%, 21.3%, and 22.1% reductions in bone resorption. There was no significant effect of calcium on bone formation measured by BAP. However, by 1-month postpartum, those in the calcium group had significantly lower NTx/BAP ratios than those in the placebo group indicating a net reduction in bone loss in the supplement group by the end of follow-up. Among subjects who consumed ≥50% and ≥75% of pills, respectively, calcium was also associated with an increase of 26.3 m/s and 59.0 m/s in radial SOS relative to placebo by 1-month postpartum.

We found that treatments for osteoporosis was Cinacalcet in 10, Ibandronatein 15, Pamidronate in 21, Etidronate in 5, Alendronate in 7 and Denosumab in 8 patients. Moller et al[12]measured BMD and BC in 153 women planning pregnancy (n = 92 conceived), once in each trimester during pregnancy and 15, 129, and 280 days postpartum. Moreover, BMD was measured 19 months postpartum (n = 31). Seventy-five age-matched controls, without pregnancy plans, were followed in parallel.Compared with controls, BMD decreased significantly during pregnancy by 1.8 ± 0.5% at the lumbar spine, 3.2 ± 0.5% at the total hip, 2.4 ± 0.3% at the whole body, and 4.2 ± 0.7% at the ultra distal forearm. Postpartum, BMD decreased further with an effect of breastfeeding. At 9 months postpartum, women who had breastfed for <9 months had a BMD similar to that of the controls, whereas BMD at the lumbar spine and hip was decreased in women who were still breastfeeding. During prolonged breastfeeding, BMD at sites that consist of mostly trabecular bone started to be regained, whereas BMD at sites rich in cortical bone decreased further. At 19 months postpartum, BMD did not differ from baseline at any site. During pregnancy, fat- and lean-tissue mass increased by 19 ± 22% and 5 ± 6%, respectively. Postpartum, changes in fat mass differed according to breastfeeding status with a slower decline in women who continued breastfeeding. Calcium and vitamin D intake was not associated with BMD changes.

Raffaeta et al[13]presented two cases of young women who developed severe PAO with vertebral fractures: a 42-year-old woman with a family history of osteoporosis, and a 21-year-old woman affected with myasthenia gravis. Case 1 presented fragility fracture of D12, L2, and L3. She did not have any disease-

causing osteoporosis. However, she had a positive familial history for osteoporosis and during pregnancy (12th week) she had a detached placenta, so bed rest was prescribed for two months. Case 2 presented multiple vertebral fracture. The patient was affected by myasthenia gravis, which was diagnosed two years before pregnancy, and treated with corticosteroid. Seok et al[14] reported a case of a 39-year-old woman who suffered from lumbago 3 months after delivery. Biochemical evidence of increased bone resorption is observed without secondary causes of osteoporosis. A radiologic examination showed multiple compression fractures on her lumbar vertebrae.

The limitation of the study is the small sample size.

CONCLUSION

Authors found that maximum women with pregnancy and lactation osteoporosis had fractures of lumbar spine and pelvis, rib, and lumbar vertebra.

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