

Case Report

Case series of gestation and lactation associated osteoporosis and a review of the literature

Feyzi Gokosmanoglu¹, Ceyhun Varım^{2*}, Hasan Ergenc², Cigdem Tura Bahadir³,
Elif Kilic Kan³, Ramis Colak³

¹Department of Endocrinology, Sakarya University Training and Research Hospital, Sakarya, Turkey

²Department of Internal Medicine, Sakarya University Training and Research Hospital, Sakarya, Turkey

³Department of Endocrinology, Ondokuz University Medicine Faculty, Samsun, Turkey

Received: 16 February 2016

Accepted: 23 March 2016

*Correspondence:

Dr. Ceyhun Varım,

E-mail: ceyhunvarim@sakarya.edu.tr

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Generalized osteoporosis associated with gestation and lactation is a rarely-seen case, which is seen during the final period of gestation or right after birth/delivery. The etiology and pathogenesis are not fully known. The fact that the pre-existing osteoporosis may be aggravated by gestation, that it may stem from genetic susceptibility, or that it may even be random are still under discussion. The most commonly-seen symptom is particularly the short stature due to lumbar pain during the lactation period as well as the vertebral compression fractures. In this study, we aimed to draw the attention to this rare case seen in the patients applying to the clinic with the complaint of post-natal lumbar pain, by starting from the two cases whose diagnoses and treatments were performed in our clinic.

Keywords: Gestation, Lactation, Osteoporosis

INTRODUCTION

Osteoporosis associated with gestation and lactation is a rarely-seen case. Osteoporosis developing during the gestational period is the case reported for the first time 40 years ago. It was first defined by Nordin and Roper in 1955. Its prevalence, etiology and pathogenesis is not fully known. The studies conducted in later years consist of case reports and limited number of studies. This disease causes one or more vertebral fractures characterized by severe, long-term lumbar pain and vertebral height loss in the female patients affected by it.¹ The majority of the cases are seen during the 3rd trimester or after the delivery in primigravida women.²

It was shown in the studies regarding the development of generalized osteoporosis in women that there was a

decrease in the bone mineral density due to the calcium metabolism and the physiological hormonal change that emerged in the course of the preparation of the breast tissue for lactation during the gestational period.^{3,4}

In this case report, two female patients diagnosed with generalized osteoporosis during the lactation period were discussed.

CASE REPORT

Case 1

A 30-year-old female patient visited our clinic with the complaint of common/widespread pain in her waist, neck and wrist. The patient's complaints started in the 20th-24th weeks of gestation. Her post-natal follow-up pain,

notably lumbar pain and backache in particular, which did not seem to be alleviated by resting, had continued until 12th -16th months. The patient had no medical record as to the use of an effective medication on smoking, alcohol and bone metabolism as well as a systemic disease. In her physical examination, her height was 1.57 m, and her body weight was 57 kg, while her BMI was 23 kg/m². There was flattening in the lumbar lordosis, and her waist (lumbar) movements were painful. There was no pathological finding in her neurological examination. In her direct lumbosacral vertebral radiographies, height loss was observed, which was more prominent in L3 and L5 vertebrae. In her biochemical blood examinations, alkaline phosphatase was 308 (N: 95-280 IU); the 24-hour-urinary calcium excretion was 360 mg/day, whereas 25-OH-D was 12.7 (30-80 µg/ml), and parathormone was 47 (N: 15-65 pg/ml).

The thyroid function tests, acute phase reactants, celiac panel, anterior hypophysial hormones, rheumatological examination and malabsorption-oriented examination were determined to be normal. In her dual-energy X-ray absorptiometry (DEXA), L1-4 total T-score was determined to be -2.3, and the femur (femoral) neck T-score was identified as -1.6. In the lumbar magnetic resonance imaging, a prominent height loss was seen in the lumbar vertebrae (Figure 1). In the light of all of these findings, the patient was considered to have had diffuse osteoporosis due to gestation and lactation. Her medical treatment was arranged as follows: calcium: 1200 mg/day, and vitamin D: 800 IU/day throughout the treatment period. A consultation was made with the Clinic of physical therapy and rehabilitation, and the patient was advised to do strengthening exercises as well as aerobic exercises, walking and postural exercises for her waist (lumbar region) and back extensor muscles. During the follow-up period, the patient's DEXA was shot a year later, after which L1-4 T-score proved to be -2.2, whereas the femur neck T-score proved to be -0.2, and it was also seen that the lumbar vertebral and femoral bone densities had increased. The patient took calcium and vitamin D during our follow-up period.



Figure 1: A prominent height loss in the lumbar vertebrae, as seen in the lumbosacral vertebral MRI.

Case 2

A 22-year-old female patient applied to our clinic with the complaint of backache and lumbar pain. The patient's complaints had started in the 20th week of gestation and had continued increasingly even after the delivery. The patient had no medical record as to the use of an effective medication on smoking, alcohol and bone metabolism as well as a systemic disease. In her physical examination, her height was 1.72 m, her body weight was 62 kg, while her BMI was 20.7 kg/m². There was flattening in the lumbar lordosis, and her waist (lumbar) movements were painful. In her direct lumbosacral vertebral radiographies, height loss was observed, which was more prominent in the lumbar vertebrae. In her biochemical blood examinations, ALP was 84 (95-280 IU), and 25-OH-D proved to be 11.94 (30-80 µg/ml), while PTH was 39 (15-65 pg/ml). The thyroid function tests, acute phase reactants, celiac panel, anterior hypophysial hormones, rheumatological examination and malabsorption-oriented examination were within normal boundaries. In her dual-energy X-ray absorptiometry (DEXA), L1-4 total T-score was determined as -3.7, whereas the femur neck T-score was identified as -0.6. In line with these findings, the patient was considered to have had osteoporosis and vitamin-D deficiency due to gestation and lactation. As for her medical treatment, calcium (1200 mg/day), and vitamin D (800 IU/day) were started on.

DISCUSSION

Osteoporosis associated with gestation and lactation is seen at the rate of 56% during the postpartum period and by 41% during the 3rd trimester. In these patients, acute backache and waist (lumbar) pain as well as hip pain occur during the 3rd trimester or right after the delivery, which are also associated with vertebral compression fractures, and diffuse osteoporosis is identified in the measurements of bone mineral density.⁵⁻⁶ Women affected by this disorder apply to clinics with the complaint of backache, short stature and vertebral fractures in general. Apart from the fact that hip pain and hip fractures are seen less, there are studies in the form of case reports.⁷ This situation is usually a temporary one during the first gestation and it generally does not tend to repeat in later gestations. Both of our cases visited our clinic with the complaint of waist pain and neck ache and common pain in wrists. These patient's complaints had started in the 3rd trimester of gestation and had continued even after the delivery. There have been reported cases similar to generalized osteoporosis associated with gestation. These were defined as the cases expressed by the terminologies, such as gestational osteoporosis referred to as the transient osteoporosis of the hip during the gestational period as well as postpartum lactational spinal osteoporosis, and migratory osteoporosis and transient bone marrow edema syndrome. Often known as a self-limited pathology, the transient osteoporosis of the hip is the type of osteoporosis that develops during the 3rd trimester by constraining the hip in particular and,

sometimes, the spine (backbone) and costae (ribs), as well. It is assumed to be associated with local inflammatory response without any disruption in the bone turnover of the event.⁸ Fractures are hardly seen in the transient osteoporosis of the hip, and a total of 12 hip fracture-cases have been reported until today. However, it is more likely that generalized osteoporosis associated with gestation occur in the cases claimed to have undergone fractures due to the transient osteoporosis of the hip.⁹

On the other hand, our cases were considered to have had generalized osteoporosis associated with gestation in line with the clinical and laboratory findings. In both of the cases were lumbar vertebral compression fractures seen.

7% of the calcium reserve belonging to the mother during the gestational period is transferred to the baby, particularly in the last three months of gestation and during the 6-month-lactation (breast-feeding) period. During this period, the pregnant mother's requirement for calcium (1000-2500 mg) and vitamin D (1500-2000 IU) is on the increase. Several pregnant and breastfeeding women cannot meet their daily need for calcium and vitamin D.¹⁰⁻¹¹ The factors held responsible for the bone loss during lactation are the periods of lactation and amenorrhea, and parathormone-related peptide levels that rise during the postpartum period. It was determined in the researches that there was 3-10% bone loss in the lumbar vertebrae and in the hips of postpartum lactating mothers within 3-6 months. With delectation or lactation decrease and with the re-start of menstruation, it was shown that an early postpartum bone density had been reached.¹² In Case 1, the first menstruation started 5 months after the delivery, whereas in Case 2, it started 10 months after the delivery. It is seen in Case 1 that bone density started to improve at the end of 1st year. In Case 2, however, no control-DEXA could be shot since the patient did not accept it as her clinical condition had recovered through the treatment.

The research data are contradictory in the treatment of gestational diffuse osteoporosis. It was demonstrated that when the treatment with bisphosphonate, one of the anti-resorptive medications, was started on early, there was a significant increase in the patients' clinical findings and DEXA values, which appeared to have become prominent in the lumbar region. It is important to take into consideration the benefit-loss ratios of bisphosphonates and the long-term side-effects and reliability of these medications recommended for these cases who are quite young and in their reproductive age group when compared with an ordinary osteoporosis patient as well as attaching importance to making a decision on medical treatment on the basis of the case, because bisphosphonates are contraindicated during the gestational and lactational periods. Teriparatide, as an anabolic treatment, can be recommended as a treatment option, particularly in the patients thinking of gestation in the succeeding years, since it does not accumulate within

the bone matrix like bisphosphonates.¹³⁻¹⁵ Generalized osteoporosis related to gestation is generally a self-limited case. Calcium, vitamin D and calcitonin can be administered in severe cases. In our study, we arranged a medical treatment with 1200 mg/ day-calcium and 800 IU/day-vitamin D for both of our cases.

A consultation was made with the clinic of physical therapy and rehabilitation, and the patient was advised to do strengthening exercises as well as aerobic exercises, walking and postural exercises for her waist (lumbar region) and back extensor muscles. The clinical pictures of both cases improved when their treatment processes and menstruations started. In 1st medical treatment year of Case 1, 4.3% recovery in the lumbal region and 87.5% recovery in the femur neck was seen when her DEXA was analyzed.

In conclusion, the effects of gestation on the skeletal system are benign. Yet, rare cases in whom vertebral fracture develops during the lactational period can still be found. Early diagnosis of the patients and their follow-up period through a proper treatment method are of great importance in terms of preventing the vertebral fractures likely to occur in the succeeding gestational periods.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not Required

REFERENCES

1. Bonacker J, Janousek M, Kröber M. Pregnancy-associated osteoporosis with eight fractures in the vertebral column treated with kyphoplasty and bracing: a case report. *Arch Orthop Trauma Surg.* 2014;134:173-9.
2. Ofluoğlu Ö, Ofluoğlu D. A case report: pregnancy-induced severe osteoporosis with eight vertebral fractures. *Rheumatology International.* 2008;29(2):197-201.
3. Ward AK, Adams JE, Mughal MZ. Bone status during adolescence, pregnancy and lactation. *Curr Opin Obstet Gynecol.* 2005;17:435-9.
4. Ozturk C, Atamaz FC, Akkurt H, Akkoc Y. Pregnancy-associated osteoporosis presenting severe vertebral fractures. *J Obstet Gynaecol Res.* 2014;40:288-92.
5. Sarpel T, Kozanoğlu E, Guzel R, Goncu K. Pregnancy associated osteoporosis: seven cases of pregnancy associated osteoporosis discussed. *Osteoporos Int.* 2000;2:326-144.
6. Kamimura M, Uchiyama S, Nakagawa H. The bone metabolic conditions in pregnancy and lactation-associated osteoporosis. *Orthopedic Surgery.* 2011;VII:189-92.
7. Nakamura Y, Kamimura M, Ikegami S, Mukaiyama K, Komatsu M, Uchiyama S et al. A case series of pregnancy- and lactation associated osteoporosis

- and a review of the literature. *Ther Clin Risk Manag.* 2015;11:1361-5.
8. Di Gregorio S, Danilowicz K. Osteoporosis with vertebral fractures associated with pregnancy and lactation. *Nutrition.* 2000;16:1052-5.
 9. Güzel R, Başaran S. Kalçanın Geçici Osteoporozu. *Türk Fiz Tıp Rehab Der.* 2009;55(1):41-5.
 10. La Montagna G, Malesci D, Tirri R, Valentini G. Successful neridronate therapy in transient osteoporosis of the hip. *Clin Rheumatol.* 2005;24:67-9.
 11. Holick MF, Binkley NC, Bischoff-Ferrari HA, Gordon CM, Hanley DA, Heaney RP. Evaluation, Treatment, and Prevention of Vitamin D Deficiency: an Endocrine Society Clinical Practice Guideline. *J Clin Endocrinol Metab.* 2011;96(7):1911-30.
 12. Karlsson K, Ahlberg HG, Caroline K. Maternity and bone mineral density. *Acta Orthopaedica.* 2005;76(1):2-13.
 13. Joanna D, Wanda HS. Pregnancy associated osteoporosis-a case report. *Ginekol Pol.* 2012;83:377-9.
 14. Winarno AS, Kyvernitakis I, Hadji P. Successful treatment of 1-34 parathyroid hormone (PTH) after failure of bisphosphonate therapy in a complex case of pregnancy associated osteoporosis and multiple fractures. *Z Geburtshilfe Neonatol.* 2014;218:171-3.
 15. Hadgaonkar S, Shah KC, Bhatt H, Shyam A, Sancheti P. Post pregnancy severe spinal osteoporosis with multiple vertebral fractures and kyphoscoliosis in a multigravida: a rare case with management. *Asian Spine J.* 2015;9(4):625-8.

Cite this article as: Gokosmanoglu F, Varım C, Ergenc H, Bahadır CT, Kan EK, Colak R. Case series of gestation and lactation associated osteoporosis and a review of the literature. *Int J Adv Med* 2016;3:424-7.