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TERIPARATID IN THE TREATMENT OF OSTEOPOROSIS – OUR EXPERIENCES

Teriparatide (Forteo amp) is an active fragment (1-34) of parathyroid hormone. The physiological action of parathyroid hormone includes stimulation of bone mass production by a direct effect on bone-forming cells (osteoblasts), indirectly by increasing intestinal calcium absorption, increased tubular calcium reabsorption and renal phosphate excretion.

The cumulative positive effect of teriparatide on bone is an increase in bone density and a reduction in the risk of fractures.

The indication for the use of this medicine is osteoporosis.

The drug is administered as a subcutaneous injection (abdomen, upper arm or thigh), once a day in a dose of 20 mcg, continuously for 24 months. It is applied regardless of the meal, and it is best every day at approximately the same time.

The most common side effects of this medicine are nausea, dizziness, headaches and pain in the extremities.

During treatment with teriparatide, there may be an increase in calcium and alkaline phosphatase levels in the blood, so they need to be monitored quarterly.

The drug is not used in children, pregnant women, during breastfeeding, as well as with elevated levels of calcium in the blood (primary hyperparathyroidism), elevated levels of alkaline phosphatase (Paget's disease), severe impairment of kidney function, malignant bone disease or some other malignant disease that has metastasized to the bone and after the application of radiation therapy to the bones.

On the recommendation from our institution, seven patients were treated with teriparatide, according to the established therapeutic protocol.

All patients had anamnestic data, biochemical analyzes were performed, including calcium, phosphorus, alkaline phosphatase, PTH levels were determined and DEXA examination was performed on a Hologic explorer osteodensitometer.

Our patients have not been treated for osteoporosis so far.

Patients treated with teriparatide SZ, ĐR, SM, JG, ĐM, BS and DG were of different ages, two of the seven patients did not have any associated disease, but each patient had one or more bone fractures before treatment. One of them has been receiving corticosteroids for many years, so it is believed that she got osteoporosis

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because of that. It is characteristic of all patients that their mood was very bad before the start of treatment, but significantly improved after the end of treatment.

Patient SZ, 58 years old, has no problems, had no associated diseases, had a fracture of the right forearm, lost her menstrual cycle at the age of 44, is physically very active, has a graceful constitution, light complexion, and low body weight.

Analyzes: calcium: 2.25, phosphorus, 1.1, PTH: 54.0. ALP: 65.0.

DEXA examination indicates reduced bone density at the level of the spine in terms of osteoporosis (T score -4.4 on the spine) and reduced bone density at the level of the hip in terms of osteopenia (T score - 2.4).

After the end of the treatment, we measured the bone density again on the same device, and determined the improvement of the bone density on the spine by 7.8%. Bone density on the spine was still at the level of osteoporosis (T score - 2.7), and bone density improved by 4.4% at the level of the hip.

There were no side effects of the drug and there were no new fractures, the patient felt well, we started the therapy only with supplementation with calcium and vitamin D.

Another patient, JG, 69, complains of pain in the area of the thoracic spine, which arose suddenly, she could practically not stand on her feet. It is treated for high blood pressure and diabetes, in combination therapy with OAB and insulin.

Analyzes: calcium: 2.04, phosphorus: 1.13, PTH: 43.9, ALP: 70.0.

She lost her menstrual cycle at the age of 48.

DEXA examination indicates reduced bone density in terms of osteoporosis at the level of the spine and hips

(T score - 3.0). An X-ray examination of the TH and L-S spine shows a compressive fracture of the vertebral body TH-12.

An orthopedist who indicated wearing a relief midsole was also consulted.

After 10 days from the beginning of the use of teriparatide and relief midsole, our patient returned to regular household chores.

The control DEXA examination after the end of the therapy with teriparatide ampoules showed an improvement of bone density by 10% on both the spine and the hip, so that the bone density is now at the level of osteopenia (T-score on the spine -2.3), we continued further vitamin D therapy. Most importantly, the patient was moving normally and there were no new bone fractures.

Patient DR, 64 years old, has pain in the lumbar spine, which lasts for years. For many years, she was on corticosteroid therapy, which she received intramuscularly. She had four fractures, two with minor trauma, and even a fracture of the big toe of her right foot when hitting the leg of the armchair.

She lost her menstrual cycle at the age of 44.

Analyzes: calcium: 2.35, phosphorus: 1.15, PTH: 60.0, ALP: 75.0.

DEXA examination indicated a significant level of osteoporosis in the spine (T score - 4.4) and normal bone density in the hip.

After the introduction of teriparatide therapy, the patient no longer received corticosteroids, because the pain in the lumbar spine stopped. The patient had a fall on two occasions during the winter period, which was not accompanied by bone fractures. She feels great, has no pain and is currently only on therapy with vitamin D and calcium.

Control DEXA examination after two years of therapy with teriparatide indicates an improvement in bone density by 10.0% at the level of the spine, but the finding of bone density at the level of osteoporosis is still (T-score on the spine -2.8). Scheduled control DEXA examination for a year, and therapy to control vitamin D and calcium preparation.

The next patient who was treated with teriparatide ampoules is DG, 54 years old, complains of chest pain, bad mood, knows about reduced thyroid function, she had two bone fractures in the previous period on the substitution.

She lost her menstrual cycle at the age of 47.

Analyzes: calcium: 2.33, phosphorus: 1.19, PTH: 35.2, ALP: 60.0.

DEXA examination indicates reduced bone density in terms of osteoporosis (T score -4.8), and decreased bone density at the hip level in terms of osteoporosis (T score -2.6).

After two years of treatment with teriparatide ampoules, we have an improvement in bone density at the spine level by 22.5% (T score - 2.7) and an improvement in bone density at the hip level by 13.4% (T score - 2.0).

The patient feels great, she is in a much better mood, there were no broken bones and she is wearing high heels again. He is now on a supplement with vitamin D and calcium, and he is checked regularly.

Ms. DM, 60 years old, has no problems, is being treated by a psychiatrist and has a fracture of the left malleolus due to reduced thyroid function. The menstrual cycle stopped at the age of 53.

Analyzes: calcium: 2.36, Phosphorus: 1.1, PTH 38.0, ALP: 63.0.

Reports orthopedist: Fractura malleolii l. Son.

DEXA examination indicates reduced bone density at the level of the spine in terms of osteoporosis (T score - 3.0).

One year after the application of teriparatide, we measured bone density, which showed an improvement in bone density at the level of the spine by 10%, the quality of life of our patient significantly improved and until then there were no more bone fractures.

After two years of treatment with teriparatide, there is an improvement in bone density at the level of the spine.

(T score - 2.6), but is still mildly osteoporous.

Patient SM, 56 years old, graceful, had no bone fractures, is being treated for reduced thyroid function. The patient's mother had several bone fractures and her sister was diagnosed with osteoporosis.

The menstrual cycle ceased 48 years of age.

DEXA examination revealed reduced bone density at the level of osteoporosis (T score - 3.6) and reduced bone at the level of the hip in terms of osteoporosis (T score - 2.6).

The patient immediately accepted therapy with teriparatide ampoules. She was receiving the recommended therapy, after two years we did a new DEXA examination which showed an improvement in bone density at the level of the spine, by 6%, so that the T score on the spine - 3.1, and on the hip improvement in bone density by 4%, so that now the bone density at the hip level is at the osteopenia level (T score -2.1).

The BS patient, 64 years old, lost 5 cm in body height and had four bone fractures in one year.

The menstrual cycle stopped at 46 years of age.

So far, she has not measured bone density, she denies other diseases.

DEXA examination revealed osteoporosis at the level of the spine (T score - 3.2%) and reduced bone density at the level of the hip in terms of osteopenia (T score - 1.5).

The patient was offered teriparatide therapy, which she received for two years and did not have any side effects of the drug, she stopped losing body height and there were no more bone fractures.

The control of DEXA examination showed an improvement in bone density at the level of the spine by 5.7%, so that the finding is still at the level of the spine and further reduced to the level of osteoporosis (T score - 2.7) and an improvement in bone density at the level of the hip for 10.7%, and now the T score on the hip is 0.2.

Most importantly, the patient moved much easier and her mood improved.

Teriparatide achieved the best success in patient DG!

All patients who were offered teriparatide therapy in our institution fully complied with the therapeutic procedure. After the procedure of taking the medicine, a control DEXA examination was performed.

All patients tolerated the drug very well and did not have any side effects.

The quality of life of all patients who were treated with teriparatide was improved, they performed all tasks more easily, they were in a much better mood and, most importantly, none of them had any more bone fractures.

So far, the patients are feeling well, have no problems and have not reported any new bone fractures.

Results of an observational study Effects of Teriparatide in patients with osteoporosis in clinical practice: 42 monthly results during and after treatment from the European Extended Observation Study Forsteo (EkFos) conducted on 1400 patients, mean age 70 years, 90% of whom were female . The study showed a 47% reduction in fractures, an improvement in quality of life, as well as a significantly reduced intensity of back pain.

Conclusion: Teriparatide therapy in all our patients gave an excellent effect primarily, because so far no new bone fractures have been recorded and their quality of life has significantly improved.

Literature:

1. Nicola Napoli et al, Effects of Teriparatide in Patients with Osteoporosis in Clinical Practice: 42 –Month Results During and After Discontinuation of Treatment From the European Extended Forsteo Observational Study (ExFOS), *Calcif Tissue int*, 103 (4), 359- 371, Oct, 2018.
2. Kendler L D, et al, Publishing online, November 9, 2017, Effects of teriparatide and risedronate on new fractures in post- menopausal Women with severe osteoporosis (VERO) a multicenter, double-blind, double-dummy, randomized controlled trial.