

Article

Preparation of Osteoporotic Women in Menopause for Dental Implantation and Prevention of Early Complications

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Abstract: Frequent referral of elderly patients, especially women, for removal of dental defects with the use of implants makes this problem especially important because asymptomatic, inconspicuous course of osteoporosis can be the cause of complications during treatment with the use of intraosseous implants.

Keywords: osteoporosis, systemic osteoporosis, dental implantation, menopause.

Introduction

Conducting: Justifies the relevance and demand of the research, formulates the main goals and objectives, determines the object and subject of the research, indicates the connection of the research with the priority areas of development of science and technology in the Republic, emphasizes the scientific novelty and scientific and practical significance of the research, provides information on the application of the research results to practical activities, approbation and publication of the work, and the structure of the dissertation work.

The frequency and prevalence of osteoporosis, its impact on dental diseases and dental condition are presented, the causes and occurrence of osteoporosis in patients and its negative impact on the oral cavity in women with early menopause are discussed. Modern scientific achievements of foreign and domestic scientists, practical and theoretical approaches to the diagnosis and treatment of these pathologies are analyzed [1].

A logical conclusion is drawn about the feasibility of scientific research to improve diagnostic criteria, analyze indications for dental implantation, and analyze influencing factors in women with postmenopausal osteoporosis.

Methodology

The Departments of Oral and Maxillofacial Surgery and Otorhinolaryngology of the TTA were recruited in two stages, 90 female patients aged 48 to 55 years who were in the menopausal period. All the women were divided into 3 groups.

The first group (34 people) included patients diagnosed with menopausal osteoporosis who underwent conventional treatment (group 1). The second group included 32 patients diagnosed with menopausal osteoporosis who underwent recommended treatment (group 2). The third group (control) consisted of 24 patients without systemic bone pathology (group 3) [2].

The age of patients in the three groups was compared with a mean of 53 (51÷55), the duration of menopause (1.93 ± 0.09) and the mean age of onset of menopause (51.21 ± 0.23 years). There were no differences in the development of menstrual function in the patients in the study group. Reproductive function was achieved in 98.9% of patients.

All patients underwent a detailed clinical and laboratory examination before the start of therapy and after 3 and 12 months of treatment.

At the first visit, all patients underwent a comprehensive clinical and laboratory examination, and the level of COPD was assessed based on clinical and laboratory results.

During the second and third visits - in the postoperative period, the main clinical and laboratory parameters were studied, and the clinical effectiveness of the treatment was analyzed in research groups.

Participants were selected from October to May to minimize seasonal effects on serum vitamin D levels [3].

Clinic and anamnestic research method with patients checked and anamnestic information collected. Obstetrics and gynecological history, clinical appearance of the disease, symptoms duration, heredity and menopausal diseases development time to account received Body structure, height, weight and BMI were assessed. Hormones level: parathyroid hormone in the "Immulit 2000" analyzer blood in serum hormones amount determination for intended with a chemiluminescent enzyme connected immunosorbent analysis with the help of determined (Researches were carried out in the clinical-molecular laboratory department of the TMA 3 clinic)

Total calcium, ionized calcium and phosphorus levels were assessed using colorimetric, photometric, direct method for quantitative determination [4].

Clinical examination was conducted according to the generally accepted method. Patients inspection during general and dental condition studied.

Existing functional disorders and orthopedic treatment forecast determination for for treatment reception done all in patients general and tooth history collected. Anamnesis of collection main purpose of defects etiology, dental help chronology, earlier passed diseases and general somatic diseases, allergic reactions the existence determination he says.

Orthopantomography and computer tomography the patients initial selection stage as well from implantation followed by dynamic tracking during X-ray examination main methods as applied. Studies in the radiology department of the TMA 3 clinic was held.

Ours in our research ultrasound densitometry bone of fabrics the situation assessment for Omnisense 7000S (Sunlight Medical, Israel) device (Sunlight Medical, Israel) was held [5].

In the period from 2020 to 2022, 90 patients were treated with implant surgery and orthopedic treatment at the Polyclinic of TGSI "Surgical Dentistry and Dental Implantology" and at the Department of Dentistry and Otolaryngology Department of TMA.

Result and Discussion

The analysis of the obtained data showed that the results of testing the level of parathyroid hormone and vitamin D before the introduction of calcitonin and vitamin D in all patients showed the level of menopause before pharmacological and implantological treatment.

Before the start of therapy, blood biochemical indicators did not deviate from the reference values. The parameters of calcium and phosphorus, glucose and glycosylated hemoglobin in group 2 were statistically significantly ($p < 0.05$) different from group 1 and group 3, which indicates the negative effect of vitamin D deficiency on these parameters.

Analyzing the dynamics after three months, parathyroid hormone ($p < 0.001$) and ($p < 0.001$) decreased, and estradiol ($p < 0.001$) increased in all observed groups, which is natural [6]. Against the background of using Miakaltsik (nasal spray) 200 IU dose (total 14 doses in 1 fl) and vitamin D (coledan) 500 IU 1-2 drops per day in the form of drops, dissolved in a spoon. Thus, in patients of all groups, after three months of therapy, parathyroid hormone decreased more than 2 times, and calcitonin level increased more than 2 times. This change trend observed during continue did it [7].

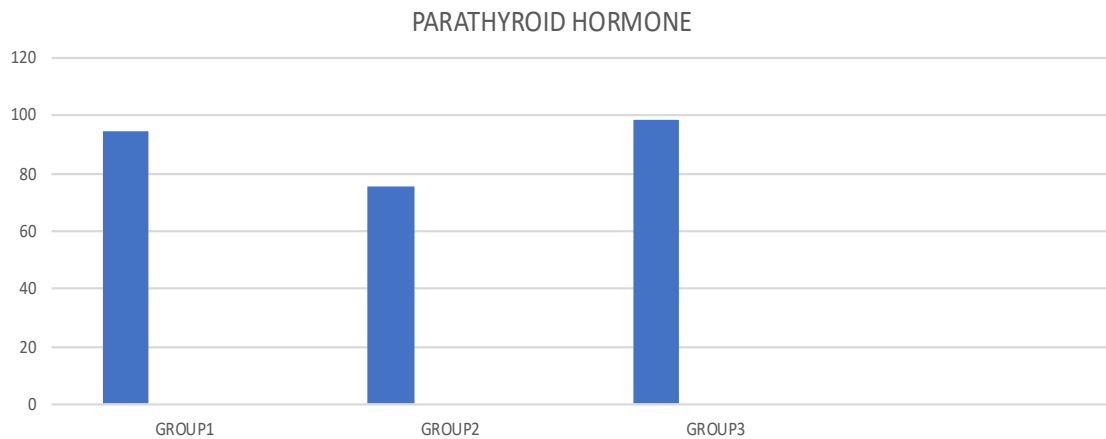


Figure 1. Serum parathyroid hormone levels (pg / ml) in the studied patient groups.

Vitamin D shortage and shortage in the background life of the quality main indicators in comparison, we 25(OH)D values the lower, the earlier postmenopausal during women's life adjective reflection delivery person indicators so much bad will be said to the conclusion We have arrived.

Dental checkup that showed that milk index average value 24.2 ± 1.5 in group 1; 22.9 ± 1.8 in group 2; and 15.7 ± 1.2 in group 3 was. So and osteoporosis in women of caries intensity somatic healthy to people 1.5 times than high ($p < 0.05$).

With osteoporosis sick in patients periodontal pockets depth not systemic bone pathology not patients from the group different unlike, the depth is more than 6 mm was pockets was determined (33.3% in group 1 and 18.2% in group 2) not exceeding 6 mm need [8].

According to our data, in 5 patients of group 1 (33.3%) the activity levels of bone alkaline phosphatase were within normal limits, in 4 (26.7%) there was a decrease in this indicator, and in 6 (40.0%) there was an increase.

In group 2, 18 people, accounting for 81.8%, showed a decrease in alkaline phosphatase activity. The remaining 4 examined (18.2%) in this group had alkaline phosphatase activity within normal limits.

In group 3, all patients had bone alkaline phosphatase activity levels within normal limits.



The primary stability of the implant and osseointegration of the implant depends on the degree of osteoporosis and on the mineralization of the bone and on the type of implant. In menopausal osteoporosis, the cortical layer is thinner and the spongy layer becomes looser. Because of this, we will not be able to carry out bicortical fixation on the D3-D4 areas of the bone. Spongy fixation is more reliable. riveting with bone, we managed to achieve good primary stability even in the softest porous bone [9]. At the same time, there is no excessive pressure on the surrounding bone tissue, since the implant fits firmly into the bone itself. High primary stability is achieved by increasing the friction force between the implant and bone tissue.



When studying densitometric data in the area of dentition defects, it was revealed that in patients of group 1, the density in 93.1% of cases was below 200 units. H (units on the Haunsfield scale), and only in 6.9% - ranged from 300 to 500 units. N. However, despite the low density of spongy bone substance, almost all patients of groups 1-2 had different areas of bone density depending on the degree of osteoporosis in the upper jaw, distal parts, moderate cortical bone, loose spongy bone D3-D4. This allowed for spongy fixation of the implants, ensuring their reliable primary stability, which is so important for osteoporosis [10]. On the lower jaw and on the upper jaw, in different areas of bone density D1-D2, we performed implantation with different implants with bicortical fixation

Table 1. Initial values of the main biochemical blood parameters in patients of the study group.

Index	Norm	Group 1	Group 2	Group 3
Total calcium	2.2-2.65 mmol/l	2.21±0.04	2.39±0.02 p1***, p2**	2.18±0.06
Calcium ionized	1.13-1.32 mmol/l	1.15±0.01	1.18±0.01 p1*, p2*	1.14±0.01
Phosphorus inorganic	0.81-1.45 mmol/l	1.01±0.02	1.08±0.02 p1***, p2***	1.01±0.02

Good immediate results of implantation in patients of group 1 were obtained in the majority of cases - 25 (86.2%), and unsatisfactory results were noted only in 6.9% of cases. Thus, in this group there were 2 cases of implant disintegration, which had to be removed at the stage of installation of gum formers.

In group 2, 2 implants (5.5%) failed, which were removed during the installation of gum formers, due to their lack of integration with the surrounding bone due to the formation of a layer of fibrous tissue.

In group 3 (control), due to complications that developed during the installation of gum formers, 2 implants (5.2%) were also removed due to lack of osseointegration [11], [12].

Table 2. Short-term results of implant use

Immediate results after treatment			
Groups	Good	Satisfactory	Unsatisfactory
1 (n=29)-	25(86.2%)	2(6.9%)	2(6.9%)
2 (n=36);	28 (77.8%)	6 (16.7%)	2(5.5%)
3 (n=38)	31 (81.6%)	5 (13.2%)	2(5.2%)

Analysis of long-term clinical results was carried out after prosthetics for a period of 6 months to 2 years.

In group 1, after prosthetics, only 1 implant (3.4%) was removed after 1.5 years of operation due to significant resorption around its intraosseous part.

In group 2, up to 2 years after surgery, unsatisfactory treatment results were observed in 3 cases (8.3%).

In group 3, an unsatisfactory result was noted in the area of 2 implants (5.2% of cases).

Thus, in patients with osteoporosis, the percentage of implant removal was slightly higher than in patients without pathology of the skeletal system, but the differences were insignificant, which proves the effectiveness of the treatment regimen we developed for patients with osteoporosis [13].

X-ray examination showed that by the time of installation of orthopedic structures, in all observed groups, both horizontal and vertical resorption of bone tissue in the implant area was clinically insignificant or absent.

Six months after the start of full functioning of the implants, radiographic examination also did not show significant bone resorption in all 3 groups.

2 years after implantation, in patients of group 1, horizontal resorption of bone tissue in the area of the bone-implant interface was noted in 41.3% of cases. Its average value was 0.8 ± 0.2 mm.

The presence of radiologically visible resorption in patients of group 2 was observed in 55.6% of implantation sites. The average resorption value was 1.3 ± 0.2 mm.

In patients included in group 3, horizontal resorption was observed in 52.6% of cases and averaged 0.7 ± 0.1 mm.

When analyzing the results of ultrasonic osteodensitometry in patients of all groups, it was found that the density of bone structures recorded by ultrasonic osteodensitometry in the area of the apex, middle and base of the implant body has the highest values in the area of the base of its body. This feature is also characteristic of the density of bone structures of intact teeth [14], [15].

The data obtained indicate that with good results of orthopedic treatment using implants, patients have almost the same bone density in the peri-implant area and adjacent areas. Knowledge of the design features of the implant allows you to achieve not only good primary stability, but also significantly reduce the number of operations, reduce injuries and speed up rehabilitation time.

Conclusion

1. Among patients with osteoporosis, the intensity of caries is 1.5 times higher, and in the structure of the PCI index the proportion of extracted teeth is significantly higher than in somatically healthy individuals. Patients with osteoporosis showed a more severe degree of periodontal tissue damage compared to the control group, despite the same level of oral hygiene. Optical density of the spongy substance of the alveolar processes in patients with menopausal osteoporosis is -150 ± 20 units. N, there are 30% fewer patients without pathology of the skeletal system, which indicates a sharp decrease in the mineralization of the bone tissue of the jaws in osteoporosis.

2. The most pronounced biochemical disturbances are observed in patients with postmenopausal osteoporosis. In women with menopausal osteoporosis after applying the proposed therapy after 3 months, parathyroid hormone decreased by 26.7%, calcitonin and vitamin D, in turn, increased by 40.0% and 200-300 IU, respectively, which is a positive factor when carrying out dental implantation and preventing complications in patients with this pathology.

3. In patients with osteoporosis of group 1, the speed of passage of the sound wave is reduced, on average, by 31.1%, and in patients with osteoporosis of group 2, by 41.6%, compared with the group of people without systemic bone tissue pathology. The data obtained allow us to judge the decrease in the amount of bone substance of the jaws per unit volume in patients with osteoporosis

4. Long-term results of implantation indicate that in patients with menopausal osteoporosis, subject to gentle implant installation techniques and peri-implantation drug therapy, a favorable treatment outcome is noted in 91.7-93.2% of cases.

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