

# THE ROLE AND PLACE OF OSTEODENSITOMETRY IN POSTMENOPAUSAL OSTEOPOROSIS

MARCELA SILVIA VASLUIAN<sup>1</sup>, ORS NAGY<sup>2</sup>

<sup>1</sup>DPH Mureș, <sup>2</sup>University of Medicine and Pharmacy Targu Mures

**Keywords:**  
osteoporosis,  
osteodensitometry,  
fracture

**Cuvinte cheie:**  
osteoporoză,  
osteodensitometrie,  
fractură

**Abstract:** Osteoporosis has become one of the major medical conditions and social, public interest in most countries of the world. Our study demonstrates the severity of clinical complications of postmenopausal osteoporosis, first hip fracture and spine. Efficacy and prognostic value osteodensitometriei primarily by DEXA procedure is obvious. The most pressing problem remains especially the prevention of osteoporosis sometimes very serious complications and with a grim prognosis due to different types of fractures

**Rezumat:** Osteoporoza a devenit una dintre afecțiunile majore în domeniul medical și social, de interes public general în majoritatea țărilor din lume. Studiul nostru clinic demonstrează gravitatea complicațiilor osteoporozei postmenopauzale, în primul rând a fracturilor de șold și a coloanei vertebrale. Eficacitatea și valoarea prognostică a osteodensitometriei în primul rând prin procedeuul DEXA este evidentă. Cea mai stringentă problemă rămâne în continuare prevenirea osteoporozei dar mai ales a complicațiilor uneori foarte severe și cu un prognostic sumbru datorate diferitelor tipuri de fracturi

## INTRODUCTION

Osteoporosis is a disease defined as “loss of bone mass accompanied by modifications in bone tissue micro architecture, which in consequence leads to a diminishing bone resistance and greater risk of fracture”. This rarified osteopathy lacks symptoms until the appearance of fractures and in consequence its diagnosis may be delayed, if paraclinical means, applied systematically to individuals at risk, are not utilized.

The International Osteoporosis Foundation (IOF) recommends as a standardized criteria in postmenopausal osteoporosis the BMD evaluation by the DEXA technique on the hip using as a reference point in calculating the T score the NHANES III collective.

In postmenopausal women, the guide proposed by the National Osteoporosis Foundation (NOF) indicates measuring osteodensity in:

- women under 65 who associate with one or more osteoporotic risk factors
- women over 65, independent of risk factors

The definition of osteoporosis on the basis of bone mineral density was implemented in 1991 and completed in 1994 by a WHO committee (The WHO Study Group 1994). Osteoporosis has been defined as a metabolic disease of the bone characterized by low bone mineral density with weakness in the micro architecture of bone tissue, thus increasing bone fragility and the risk of fracture.

Bone mineral density represents the determining factor in bone resistance, explaining 50-70% of its versatility. A precise definition of BMD is the mass of mineral bone tissue reported to bone volume, excluding the marrow and non-skeletal tissues.

In strict terms, the technology available now does not permit the measurement of real BMD. What is measured

through densitometry techniques is the apparent BMD, defined as the quantity of bone tissue detected in a skeletal region (reported to the bone volume), region which contains, together with bone tissue, bone marrow and other non-skeletal tissue.

## AIM OF THE STUDY

Our clinical study shows the gravity of postmenopausal osteoporosis complications, firstly hip and spinal column fractures

## MATERIAL AND METHOD

We have analyzed 200 female patient in postmenopause who have been admitted to the Orthopedic and Traumatology Department of Tg.Mures County Emergency Hospital between 2005-2008. The patients were admitted with the following diagnostics:

- hip fracture – 181 cases
- radius fracture – 6 cases
- spinal column fracture or combined fractures suffered after falls on the same level - 13 cases

After surgery, figure 1.A and 1.B, bone density values were determined using the DEXA method - figure 2, table II.

Figure 2 shows that after BMD measurements in patients who have already suffered a complication due to osteoporosis, more specifically, a hip fracture, 176 of them presented osteopenia or osteoporosis and only 5 patients presented normal BMD values. The same modifications were found in the other types of fractures

Clinically speaking, the applicability of osteodensitometry, as a method of measuring BMD values, lies in:

- appreciating BMD in individuals with a high risk factor;
- estimating fracture risk;

<sup>1</sup> Corresponding Author: Marcela Silvia Vasluiian, 3/A, Avram Iancu street, Targu Mures, România; e-mail: marcela\_vasluiian@yahoo.com; tel +40-722431486

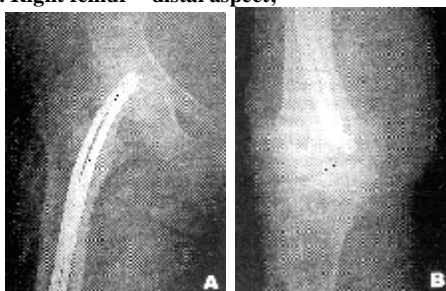
Article received on 27.01.2010 and accepted for publication on 03.02.2010

ACTA MEDICA TRANSILVANICA June 2010; 2(2)220-221

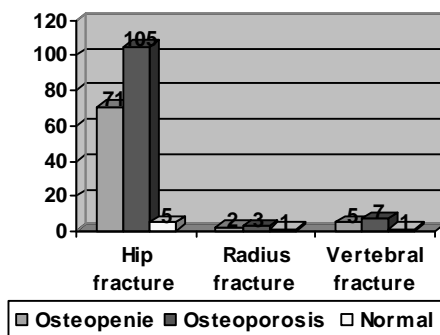
## CLINICAL ASPECTS

- deciding upon a specific therapy, corroborating osteodensitometry with clinical, biochemical and hormonal parameters;
- monitoring the loss of bone mass and the response to treatment;

**Figure no. 1. a. Right femur – osteosynthesis with Ender rod; .b. Right femur – distal aspect;**



**Figure no. 2. Bone mass density – BMD at discharge**



**Table no. 1. BMD values at discharge from the orthopedic departement after the treatment of fractures**

| Osteodensity | Hip fracture | Radius fracture | Vertebral fracture |
|--------------|--------------|-----------------|--------------------|
| Osteopenie   | 71           | 2               | 5                  |
| Osteoporosis | 105          | 3               | 7                  |
| Normal       | 5            | 1               | 1                  |

### RESULTS

The table below presents categories of diagnosis for BMD deficit, defined by WHO by the T score.

**Table no. 2. WHO diagnosis range of BMD**

| Diagnosis categories | Definition  |
|----------------------|---|
| Normal BMD           | T Score $\geq -1DS$   |
| Osteopenie           | - 1DS > T Score >2.5 DS comparing to young adult same gender and race |
| Osteoporosis         | T Score $\leq 2.5 DS$ comparing to young adult                        |

A BMD under the -2.5 DS threshold in the lumbar spinal column, hip or forearm diagnoses approximately 30% of women in postmenopause as suffering of osteoporosis. This percentage corresponds with the risk of fracture on this skeletal regions.

Independent of gender or race, the advice given by the International Society of Clinical Densitometry adopted during a conference is that the following groups of individuals enjoy osteodensitometry:

- subjects with antecedents in fragility fractures;
- subjects with conditions known as risk factors for osteoporosis;
- women in post menopause with associated risk factors;
- women over 65;
- men over 70;
- any subject in which a lowered DMO could lead to fracture risk reduction therapy;

Preventing osteoporosis and the devastating results caused by fractures is one of those emergencies with a double meaning, both regarding life quality, and economy. The low level of detail regarding osteoporosis, linked with risk factors, produces a high level of fractures. Only by increasing the interest and knowledge levels regarding this disease for women, before the onset of menopause, can lead to preventing factors and future functional problems. They have to understand the importance of risk factors, the prevalence and costs of osteoporosis, and learn how to prevent and treat this illness. Both a material and a medical backing must be assured for those who suffer from osteoporosis. Only so, this quiet epidemic can be disarmed.

### CONCLUSIONS

- Osteoporosis has become one of the major afflictions in the medical and social fields, of public interest in all the major countries of the world;
- Our clinical study shows the gravity of postmenopausal osteoporosis complications, firstly hip and spinal column fractures;
- The majority of patients suffer a major osteoporotic complication, presenting osteopenia or osteoporosis in the moment of the accident or trauma suffered;
- The efficiency and estimated value of osteodensitometry through the DXA process is evident;
- The most stringent problem remains preventing osteoporosis but more importantly, its complications sometimes very severe and with a somber prognosis;
- We consider that fundamental research is continually needed in order to find adequate answers regarding profilaxy, etipatogeny, complications and treatment of postmenopausal osteoporosis;

### BIBLIOGRAPHY

1. Bătașă Tiberiu, Nagy S. Örs, Seres-Sturm Ludovic. Fractura de șold în osteoporoză. 1999 Casa de Editură „Mureș”, Târgu-Mureș, pg. 27,29,78.
2. Georgescu Carmen. Osteoporoză, fiziopatologie – diagnostic – tratament. 2005 Editura RISOPRINT, Cluj-Napoca, pg. 106, 108-109, 111-114.
3. Kanis JA. Assessment of fracture risk in application to screening for postmenopausal osteoporosis: synopsis of a WHO report. 1994 WHO study Group 4:368-381.
4. Looker AC, Johnston CC Jr, Wahner HW, Dunn WL, Calvo MS, Harris TB, Heyse SP, Lindsay RL. Prevalence of low femoral bone density in older U.S. women from NHANES III. 1995 J Bone Miner Res 10: 796-802.
5. Melton LJ 3rd. How many women have osteoporosis now? 1995 J Bone Miner Res 10: 175-177.