

Comment

This issue of "Progress in Medicine" focuses on a selection of the most common metabolic bone diseases: osteoporosis in adults, nutritional rickets and osteogenesis imperfecta in children and the significant role of vitamin D on calcium and bone homeostasis and on its pleiotropic action. We present five original articles, one case report, twelve review articles and expert recommendations that focus on current information.

In their article on vitamin D status and disease activity in patients with rheumatoid arthritis (RA), Povoroznyuk et al. revealed that vitamin D deficiency should be considered an important predictor of the high RA activity.

Łupińska and Chlebna-Sokół focused their research on the evaluation of the prevalence of vitamin D deficiency in school children with excess body weight. The authors revealed a negative relationship between fat mass, body weight and serum 25(OH)D concentration. This result confirms the theory that obesity is a possible risk factor for vitamin D deficiency and demonstrates how important it is to adhere to the existing recommendations for vitamin D supplementation with this group.

Rusińska et al. compared the clinical symptoms of various types of osteogenesis imperfecta (OI) in patients supervised by their Department. They concluded that OI is a heterogeneous group of skeletal disorders associated with increased predisposition to fractures, and characterised by significant variation of symptoms in individual types of the disease. The authors stress that a clear diagnosis and prognosis can be difficult in some patients, due to the "overlapping" of symptoms in some types of OI (I and IV, II and III, III and IV) and the modifying effect of implemented treatment.

Kupisz-Urbańska et al. evaluated vitamin D supplementation in elderly nursing home residents and concluded that, among all the subjects, three months of vitamin D supplementation was sufficient to achieve a vitamin D serum suboptimal value.

Wójcik et al. compared the methods for serum determination of 25(OH)D (automatic CLIA on IDS-iSYS and LIAISON analyzers) and 1,25(OH)₂D (semi-automatic CLIA on IDS-iSYS analyzer and manual RIA) in pediatric and DEQAS samples. They found a high precision of serum 25(OH)D and 1,25(OH)₂D determination using CLIA methods on the IDS-iSYS platform. The comparison of these methods with the methods routinely used in the Department of Biochemistry, Radioimmunology and Experimental Medicine make it possible for their use in clinical practice in pediatric hospitals while maintaining the highest diagnostic standards.

Jakubowska-Pietkiewicz et al. presented the diagnosis and treatment, including intensive medical and hospice care, in a 3 year old boy diagnosed with type II OI. The evolution in both the diagnosis and therapy, as well as the necessity for multidisciplinary cooperation, which changes clinical course and prognosis for lethal IO, were highlighted.

Płudowski et al. in a review article entitled „Best practices for the management of vitamin D deficiency” explain that because of growing evidence of vitamin D related pleiotropic effects, an update of supplementation guidelines is warranted to ensure its optimum supply and health benefits. They stress that vitamin D supplementation guidelines should be adopted regionally or nationally, but not as a global recommendation, as more optimal. From practical perspective, the choice of the most appropriate recommendations will depend on many factors both clinically and environmentally.

In an article regarding "Vitamin D – skin synthesis revisited" Łukaszkiwicz writes about the role of keratinocytes. He stresses that among the human body cells, the keratinocytes stand out as those which confer the full spectrum of metabolic reactions concerning vitamin D from its synthesis to conversion into active metabolites and inactivation. This special position of keratinocytes stems from their location and function as a boundary layer between the human body and the environment.

Targowski in his article, describes differences in the metabolism of vitamin D in patients with sarcoidosis, as well as the potential clinical significance of this disorder. He writes that hypercalcemia and hypercalciuria due to excessive activation of vitamin D are relatively common symptoms associated with granulomatous diseases such as sarcoidosis and due to the loss of bone mass.

Raczkiewicz and Tłustołowicz in a review article, summarize the research on the relationship between vitamin D, and development and outcomes of rheumatoid arthritis. They concluded, despite a growing number of publications, that the evidence of a clear role of vitamin D in RA, is still rather weak. Whether low 25(OH)D serum concentration is the cause or simply the result of a chronic disease is not known.

Marcinowska-Suchowierska and Płudowski in the next review article discuss a rare complication due to hyper-vitaminosis D also called vitamin D toxicity (VDT). They report that VDT is usually caused by extremely high doses of vitamin D supplements, not by diet or skin exposure to the sun and the hypercalcemia due to an overdosed vitamin D may appear if serum 25(OH)D levels are higher than 150-200 ng/ml. Hypercalcemia from VDT is rare, but it is a dangerous state for the organism and requires adequate treatment.

In their article “Nutritional rickets – revisited” the authors direct the attention of the readers to the fact that prevalence of nutritional rickets has changed over the recent years due to demographic trends. The disease has been most commonly seen in children from the Middle East, Africa, and South Asia. However, the incidence of rickets has also increased in Europe, particularly among those non-Caucasian children born in or immigrating to high-income countries. These demographic trends show that rickets prevention programs that target at risk infants and children is important. The European Vitamin D Association (EVIDAS) offers a proposal for the consideration of the national health authorities to implement vitamin D deficiency screening and rickets prevention programs as an integral part of the routine vaccination visits in primary pediatric care (joint immunization schedule).

In their article “Expanded criteria for diagnosis of osteoporosis” Czerwiński et al. stress the fact that the current WHO diagnostic recommendations for osteoporosis are unsatisfactory because, according to the proposed criterion, 70% persons who suffered fractures do not suffer from osteoporosis. They present an expanded criteria published by the National Bone Health Alliance in 2010 which has been adopted to Polish population by a group of experts on osteoporosis in 2015.

In the review article “Vitamin D supplementation in glucocorticoid induced osteoporosis” Głuszko, an expert in GIO, presents a rational for vitamin D treatment in GIO and summarises current guidelines indicating calcium and vitamin D supplementation in fracture prevention strategy.

The issue of falls, which WHO recognizes to be one of the major health and social issues among the elderly, is presented by Berwecka et al. They discuss the complex causes of falls and methods to prevent falls. They focus on the action that vitamin D plays an important role in maintaining proper muscle function in the elderly, including prophylaxis of sarcopenia. The authors point out that deficiency of vitamin D is increased in the risk of falls. A wide spectrum of vitamin D₃ benefits, combined with its low cost, gives enough evidence that prophylactic supplementation of vitamin D₃ should be included in the treatment of patients with vitamin D deficiency.

In the article “Calcium consumption in diet of elderly patients – literature review”, the authors, Warzecha and Czerwiński, show that the calcium intake is reduced in the world as compared to the reference values, both in the elderly and in patients who had sustained osteoporotic fractures. The data indicates the need for patient education in the field of adequate nutrition in the treatment and prevention of osteoporosis. Also calcium supplementation must be considered in populations especially exposed to deficiency.

In their paper “Vitamin K₂ and osteoporosis – facts and myths” the authors, Stuss and Sewerynek, focus on vitamin K as a factor responsible for appropriate functioning of the bone. They present a current view of the action of vitamin K₂ and attempt to answer the question whether supplementation with vitamin K, including K₂, significantly influences the bone tissue, providing protection against osteoporosis.

Boroń et al. – the authors of the article, “The role of inflammatory factors in pathogenesis of postmenopausal osteoporosis”, summarized review articles and theirr experimental works and discusses the pathogenesis of osteoporosis. They focus on discovery of particles controlling osteoclasts: activators of the receptor of nuclear factor κB (RANK), its ligand RANKL and the natural receptor trap for RANKL, i.e. osteoprotegerin (OPG). They stress the role of cytokines which has been to support or inhibit bone resorption. They discuss proresorptive factors, stimulating osteoclastogenesis by increase RANKL expression: interleukin IL-17 and TNF-α.

*Professor Ewa Marcinowska-Suchowierska, MD, PhD, Centre of Postgraduate Medical Education
Associate Professor Paweł Płudowski, MD, PhD, The Children’s Memorial Health Institute*