Introduction to Vitamin D Symposium, March 14, 2008

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A large body of work in diverse clinical and scientific areas has accumulated that supports a role for vitamin D in multiple organ systems and physiologic and molecular processes. The vitamin D receptor is distributed ubiquitously, and by binding with its receptor, vitamin D initiates a series of events that can affect cellular proliferation and differentiation, inflammation, the immune system, and the endocrine system, including the renin-angiotensin system, insulin resistance, and lipid metabolism.

In the past three decades, there has been great interest in a role of vitamin D in multiple organ systems, where it enables numerous physiologic processes at the cellular and molecular levels; however, during this same period, a large body of work in diverse clinical and scientific areas has accumulated indicating that vitamin D also affects nonosseous organ systems and other physiologic and molecular processes. We now know that the vitamin D receptor, through which vitamin D exerts its effects, may be found ubiquitously and by binding with its receptor vitamin D initiates a series of events that can affect cellular proliferation and differentiation, inflammation, the immune system, and the endocrine system, including the renin-angiotensin system, insulin resistance, and lipid metabolism. Studies of vitamin D–deficient individuals and studies of animals that were made vitamin D deficient showed an association with or the development of increased left ventricular mass index, increased cardiac fibrosis, coronary artery calcification, and decreased inotropy. Such studies also revealed increased renin-angiotensin activity; vascular endothelial dysfunction; fibrosis; vascular smooth muscle cell hypertrophy; and the development of hypertension, insulin resistance, interstitial renal fibrosis, podocyte damage, and glomerulosclerosis.

Last, there is an association with cancer. Thus, it seems that vitamin D may be a determining factor in the development of some of society’s major health hazards, namely coronary heart disease, heart failure, hypertension, chronic kidney disease, diabetes, and cancer. Moreover, because it is now known that vitamin D deficiency is more widespread in the general population than previously thought, these nonclassical effects of vitamin D should be more intensively investigated, and vitamin D status should be included among the important risk factors for disease.

To this end, this symposium on vitamin D presented the current state of the art with regard to the role of vitamin D in neoplastic, cardiovascular, and kidney diseases and emphasized the central place that vitamin D status may occupy in the pantheon of disease risk factors. Dr. Robert Heaney (Creighton University) led off the discussion with his presentation “Vitamin D in Health and Disease.” This was followed by a discussion by Dr. Linda Demer (University of California, Los Angeles) of “Vitamin D and Cardiovascular Disease” and then by Dr. Michael Holick (Boston University) on “Vitamin D and Cancer” and concluded by Dr. Kevin Martin (St. Louis University) with “Vitamin D and Kidney Disease.”

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