

## Re: Prevalence of Pulmonary Hypertension in Patients Undergoing Hemodialysis Evaluation All Affecting Factors Otherwise Freak of Nature!

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Dear Editor,

We read the article "Prevalence of Pulmonary Hypertension in Patients Undergoing Hemodialysis" by Fadaei and coworkers with interest.<sup>1</sup> The authors aimed to investigate the prevalence of pulmonary hypertension (PH) in patients undergoing hemodialysis. They concluded that PH is associated with duration of dialysis, age, and ejection fraction. They suggested that it is necessary to screen PH and minimize its effects due to the high prevalence of PH among hemodialysis patients.

Pulmonary hypertension is characterized by an increase in pulmonary vascular resistance and right ventricular failure. It can be idiopathic, familial, or associated with the other conditions or diseases.<sup>2</sup> It is divided into five groups according to the updated clinical classification derived from the Dana Point meeting.<sup>3</sup> Chronic kidney failure on dialysis is defined as a "fifth group." The mechanism of PH in the fifth group is unclear or it can be related to multifactorial reasons as mentioned in the present study. Diagnosis of PH in the fifth group depends on the specific algorithm.<sup>3</sup> All other reasonable possibilities must be excluded (including primary pulmonary hypertension, the more common clinical groups of PH as group 2, group 3, and other groups). Right heart catheterization is the current reference test for the diagnosis and estimation of the severity of PH. Doppler echocardiography is useful screening test for PH. In the presence of a completely normal right ventricular size and function, an increased tricuspid jet velocity does not require further investigation.<sup>4</sup> Otherwise, the diagnosis should be confirmed by right heart catheterization.

In the present study, pulmonary artery pressure was measured by echocardiography and a value equal to or higher than 35 mm Hg was considered PH and it was the only diagnostic tool. According to previous data, up to 60% of patients with severe left

ventricular (LV) systolic dysfunction and up to 70% of patients with isolated LV diastolic dysfunction may present with PH.<sup>3</sup> Because of the fact that, not only reduced ejection fraction, but also LV diastolic dysfunction can affect pulmonary artery pressure in patients with PH. The authors did not mention LV diastolic function. It may be useful for clinicians, further studies will investigate LV diastolic function in these patients. Additionally, the timing of the last dialysis session is very important. The main consequences of kidney failure are intravascular and extravascular volume overload and varying degrees of left-sided heart failure and then it can alter pulmonary artery pressure.<sup>5</sup> Because of this echocardiography results can be changed by volume reduction due to hemodialysis session.

In addition, when investigating PH in chronic kidney failure on hemodialysis, all other reasonable possibilities and comorbidities like chronic liver diseases, lung diseases, infectious diseases and chronic haemolytic anaemia except for cardiac diseases should be excluded.

Finally, in the present study, if the authors had given information about these factors, including laboratory parameters such as hepatic test and radiological, spirometric (restrictive and obstructive diseases), and echocardiography findings with diastolic functions, the results of the study might be different. We believe that these findings will enlighten further studies about pulmonary hypertension in patients undergoing hemodialysis.

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## Re: Association Between Serum Magnesium and Risk Factors of Cardiovascular Disease in Hemodialysis Patients

Dear Editor,

We read with great interest the recently published article in the esteemed *Iranian Journal of Kidney Diseases*, by Khatami and colleagues, entitled "Association Between Serum Magnesium and Risk Factors of Cardiovascular Disease in Hemodialysis Patients."<sup>1</sup> They aimed to explore the associations of serum magnesium level with various risk factors of cardiovascular disease and atherosclerosis, such as lipid profile, serum albumin, C-reactive protein, serum phosphorus, parathyroid hormone, and diabetes mellitus in hemodialysis patients. The study was conducted on 103 patients with end-stage renal disease on maintenance hemodialysis. They found no significant differences in serum magnesium levels between patients with low and high values of high-density lipoprotein cholesterol, triglycerides, low-density lipoprotein cholesterol, and blood pressure. Also, they found no correlation between apoprotein(a) and serum levels of magnesium and lipids.<sup>1</sup>

I would like to note a few points about the association of magnesium with serum lipids. Previously, we conducted a study on the association of serum magnesium with serum lipids in a group of stable hemodialysis patients.<sup>2</sup> We found a significant positive correlation between serum magnesium and lipoprotein(a) and also a positive correlation between serum magnesium with triglyceride level, too.<sup>2</sup> In agreement with our findings, recently Ansari and coworkers conducted a study on 50 patients with end-stage kidney disease on

maintenance hemodialysis treatment, from India. They found significant positive correlations of serum magnesium with serum lipoprotein(a) ( $r = 0.40$ ,  $P = .007$ ), serum high-density lipoprotein cholesterol ( $r = 0.31$ ,  $P = .01$ ), and serum triglyceride ( $r = 0.35$ ,  $P = .005$ ).<sup>3</sup> There was no significant correlation between serum magnesium and serum low-density lipoprotein cholesterol or serum total cholesterol, which was in accordance with our findings too.<sup>3</sup> It is clear that one of the factors involved in accelerated atherosclerosis in hemodialysis patients is dyslipidemia.<sup>4-8</sup>

Elevated serum magnesium level can also be a problem in patients on maintenance hemodialysis.<sup>1-3</sup> While, the kidneys are the major route of excretion of magnesium from the body, increased serum magnesium would be expected in patients with renal insufficiency.<sup>2,3</sup> Magnesium can be normal or even decreased in dialysis patients, which is probably due to decreased dietary intake in association with impaired intestinal absorption.<sup>3</sup> It is well documented that magnesium deficiency has a possible role in the perturbation of lipid metabolism in the nonuremic population.<sup>9</sup> Magnesium does not increase the lipoprotein synthesis.<sup>2</sup> It may involve in the regulation of some enzymes responsible for lipoprotein synthesis. In our study, we concluded that the correlation of serum magnesium with serum triglycerides can be due to changes in hepatic triglyceride metabolism.<sup>2</sup> Lipoprotein(a) is a nontraditional factor of premature atherosclerosis and its association with serum magnesium in our