Nephrogenic Systemic Fibrosis: Is Gadolinium to be Blamed?

Sir,

I wish to create awareness on preventable but rare, devastating complication seen in patients with severe renal failure due to Gadolinium contrast material used in Magnetic Resonance Imaging.

“Nephrogenic Systemic Fibrosis (NSF)”, previously known as “Nephrogenic Fibrosing Dermopathy”, is a rare but devastating complication seen in patients with severe kidney failure, i.e. with GFR of <15ml/min.

Nephrogenic Systemic Fibrosis is a sclero myxedema like systemic disorder characterized by erythematous, indurated, well-defined, plaques over the skin, seen commonly on limbs symmetrically, particularly in areas between ankle and mid-thigh and between wrist and mid-upper arm and also over trunk of the body. NSF is progressive, the plaques coalesce having ameboid advancing edge and skin becomes thickened and tight, leading to contractures. Patients may experience pruritus, causalgia and sharp pains over affected areas. Internal organ fibrosis also occurs involving heart, lung, liver, testis, meninges and skeletal muscles, with considerable morbidity and mortality.

Since the identification of the first case of NSF in 1997, nearly 200 cases have been described world wide.2 Although the etiopathogenesis is unclear, evidence points towards aberrant activation of circulating fibrocytes probably mediated by Transforming Growth Factor–β. Pathologically, there is marked proliferation of spindle cells, presence of numerous dendritic cells, accumulation of mucinous material and thick collagen bundles seen in affected areas of skin.

Association with recent vascular surgery, high dose iron, Erythropoietin therapy, hypercoagulation syndromes, Anti-phospholipid antibodies, Deep vein thrombosis and metabolic acidosis have been described. Recently association with Gadolinium based contrast agent has been described.1

Deo at al, reported incidence of NSF as 4.3 cases per 1000 patient years of Severe Renal Failure and that there is a 2.4% risk of development of NSF following each exposure to Gadolinium5. The appearance of first sign of disease after exposure to Gadolinium, varies from 2-75 days2. It is strongly recommended to do renal function test before Magnetic Resonance Imaging (M.R.I.) with Gadolinium contrast and to restrict the use of Gadolinium if only absolutely indicated in the presence of severe renal failure and also advised to do prompt dialysis after the contrast procedure to minimize the risk.3

There is no currently established therapy for NSF, although local steroids, CSA (Cyclosporine), CPM (cyclophosphomide), have been tried. Improvement with Intravenous sodium thiosulphate, a chelating agent has been described. Also it has been suggested to use I.V. sodium thiosulphate as a preventive measure to chelate Gadolinium, which enhances its solubility and facilitates its removal by dialysis.4

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REFERENCES