Synergistic Effect of Intravenous Immunoglobulins and Iodinated Contrast Media on Renal Function

Mojgan Safari, Seyed Hesamedin Nabavizadeh, and Sara Kashef

Department of Pediatric Immunology and Allergy, Shiraz University of Medical Sciences, Shiraz, Iran

ABSTRACT

Acute renal failure is one of the side effects while using intravenous immunoglobulins. This complication is also observed with iodinated contrast media. Herein, we describe a patient with acute renal failure who received intravenous immunoglobulins and iodinated contrast media concomitantly. Both drugs are responsible for osmotic nephrosis. The same effect on renal cells may explain a synergistic effect on renal function.

Keywords: Acute Renal Failure; Contrast Media; Intravenous Immunoglobulins

INTRODUCTION

Intravenous immunoglobulins (IVIG) are used for the treatment of a variety of inflammatory and autoimmune disorders such as Kawasaki disease, Guillain-Barre-Syndrome (GBS) and Idiopathic Thrombocytopenic Purpura. The most common side effect of IVIG includes the early complications such as flushing, headache, nausea, vomiting, myalgia, chest pain, hypertension, fever and chills. Severe adverse reactions are rare. Acute renal failure (ARF) is a rare but significant complication of IVIG. Nephrotoxicity of iodinated radiographic agents frequently remains. The incidence of radiocontrast nephropathy varies from 0 to 90% depending on a number of risk factors such as renal insufficiency, diabetes mellitus, congestive heart failure, dehydration, volume of the contrast agent administered and the use of other nephrotoxic drugs.

Herein, we describe a patient who developed ARF after IVIG therapy in association with the injection of iodinated radio-contrast agent.

CASE REPORT

A 12-year-old girl with weakness of lower extremities and loss of tendon reflexes was diagnosed and hospitalized as a case of Guillain-Barre-Syndrome. She did not have any previous history of renal diseases. Primarily, her renal function tests and urinealysis were normal. A 2-day course of IVIG (Sandoglobulin) therapy was started at a dose of 1 g/kg/day over 12 hours. On the second day of the IVIG therapy the patient had a brain CT scan with contrast for severe headache and frequent vomitings. The contrast media used was Omnipaque®, Nycomed Imaging A.S., Iohexol which is a Nonionic Radiographic Contrast Media (300 mg I/mL, Dose: 1 cc/kg).

Urine output decreased on day 3 to 0.6 ml/kg and serum creatinine raised. Urine analysis and renal ultrasound did not show any abnormality. Urine output improved on day 5 with furosemide, 1 mg/kg/day. Serum creatinine started to decrease on day 6. Renal biopsy was not performed due to rapidly favorable evolution of renal function.

DISCUSSION

IVIG nephrotoxicity is a rare complication that was first reported by Barton et al in 1987. Histopathologic findings of acute tubular, vacuolar degeneration and osmotic nephrosis were suggestive of osmotic injury to the proximal renal tubules. Obstructive ischemia secondary to renal artery
Syrnergistic Effect of IVIG and Contrast Media

vasoconstriction and alteration in glomerular hemodynamics due to an elevated plasma oncotic pressure can also be responsible for this type of ARF. The expected risk of osmotic induced changes is probably higher with sucrose and maltose containing products because of their relatively high molecular weights. Risk factors for this adverse reaction include preexisting renal injury, diabetes mellitus, dehydration, age greater than 65, sepsis, paraproteinemia and concomitant use of nephrotoxic agents. Our patient received Sandoglobulin, which is fixed by sucrose. Study of Levy JB and Pusey CD showed that patient characteristics had no effect on nephrotoxicity of IVIG. Therefore GBS is not a risk factor for IVIG nephrotoxicity. It seems that IVIG may be a risk factor for contrast media nephrotoxicity. Mechanisms responsible for the development of radiocontrast-induced renal dysfunction are not entirely understood. Several factors may interact to induce injury: tubular obstruction, direct tubular toxicity, and ischemia. Pathological changes after radiocontrast include vacuolization of the proximal tubules, interstitial edema, inflammation and tubular cell necrosis. Bassilios et al reported two cases of ARF due to receiving concomitantly both IVIG and contrast media. Their two patients received IVIG (Télégine) that was fixed by sucrose and maltose. Both drugs are responsible for osmotic nephrosis. This same effect on renal cells may explain a synergistic effect on renal function. We recommend avoidance of concomitant use of iodinated radiocontrast agents and IVIG.

REFERENCES