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

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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.[1] The most common side effect of IVIG includes the early complications such as flushing, headache, nausea, vomiting, myalgia, chest pain, hypertension, fever and chills.[2,3] Severe adverse reactions are rare.[4] Acute renal failure (ARF) is a rare but significant complication of IVIG.[2] Nephrotoxicity of iodinated radiographic agents frequently remains.[5] 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.[5-7]

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.[8] Histopathologic findings of acute tubular, vacuolar degeneration and osmotic nephrosis were suggestive of osmotic injury to the proximal renal tubules.[9] Obstructive ischemia secondary to renal artery

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vasoconstriction and alteration in glomerular hemodynamics due to an elevated plasma oncotic pressure can also be responsible for this type of ARF.[10] The expected risk of osmotic induced changes is probably higher with sucrose and maltose containing products because of their relatively high molecular weights.[8] 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.[9] 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.[11] 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.[12] Pathological changes after radiocontrast include vacuolization of the proximal tubules, interstitial edema, inflammation and tubular cell necrosis.[12] Bassilios et al reported two cases of ARF due to receiving concomitantly both IVIG and contrast media.[13] 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.

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