J Med Allied Sci 2016; 6 (2): 84-86
www.jmas.in
Print ISSN: 2231 1696 Online ISSN: 2231 170X
Journal of Medical & Allied Sciences

Case report

Rifampicin-induced interstitial nephritis: A case report and a short review of the literature

Ghouse Ahmed Khan[1], Fahad Abdullah[1], Yaseen Mohiuddin[1], S. V. Parathasaradhy[2], Mazharuddin Ali Khan[3], Ashfaq Hasan[1]

[1]Department of Respiratory Medicine, [2]Department of Nephrology, [3]Department of Orthopedics, Owaisi Hospital and Research Centre, Deccan College of Medical Sciences, Hyderabad-500058, Telangana, India.

Article history

Received 17 May 2016
Accepted 07 June 2016
Early online 10 June 2016
Print 31 July 2016

Corresponding author

Ashfaq Hasan

Professor & Head,
Department of Respiratory Medicine,
Owaisi Hospital and Research Centre,
Deccan College of Medical Sciences,
Kanchanbagh, Hyderabad-500058,
Telangana, India.
Phone: +91-9848051708
Email: ah.pulmo@gmail.com

Abstract

Rifampicin induced acute interstitial nephritis (AIN) is a relatively rare entity, but in a setting of high tuberculosis (TB) prevalence, may be met with on occasion. TB is rife. If diagnosed and treated in time, the prognosis for renal recovery is good. We present such a case of a 42 year old woman who developed ATN after treatment with a rifampicin-based anti-tubercular regimen for TB synovitis of the wrist, nevertheless patient recovered after steriod therapy.

Key words: Acute Interstitial nephritis, Rifampicin, Tuberculosis

DOI: 10.5455/jmas.229206

Rifampicin is one of the most important medications needed in a basic health system for treatment of several types of bacterial infections including tuberculosis, leprosy and Legionnaire's disease[1]. The most apparent adverse effects of rifampicin includes hepatotoxicity and nephrotoxicity for instance acute interstitial nephritis and tubular necrosis[2]. We present a case with tuberculosis (TB) synovitis of the wrist who developed AIN after treatment with rifampicin.

Case report

A 42 year old woman was received in the hospital with flu like symptoms, nausea, vomiting and decreased urine output and swelling of ankles since 5 days. She had shortness of breath on exertion and orthopnea since 2 days. She had been taking standard short-course anti-tubercular therapy for the last 1 month for a presumptive diagnosis of tuberculosis based on a synovial biopsy of wrist (after having had wrist pain and swelling of 2 months' duration). During the workup at this time, her collagen workup had been normal and her serum uric acid was also within normal limits. There was no history of diabetes or hypertension.

On examination she was slightly tachycardic and tachypneic at rest with pitting pedal edema upto her ankles. Blood pressure was within normal limits. She had fine crackles at her lung bases, bilaterally.

ECG showed sinus tachycardia but was otherwise normal. The chest X-ray showed bilateral diffuse patchy alveolar infiltrates, increased vascular shadowing and bilateral small pleural effusions (overall, suggesting of fluid overload/pulmonary edema).

Laboratory findings were as follows: Total white cell count: 17,300 (neutrophilic leucocytosis); Hb: 10.0 (normochromic hypochromic; reticulocyte count was normal); platelets 1.5 lakhs/mm; serum creatinine: 7.5; Blood urea: 69; Serum proteins: 5.9, Serum albumin: 2.8; Total Bilirubin: 3.8 (con-

jugated bilirubin: 1.7); Alkaline phosphatase: 78; SGOT: 360; SGPT: 175; Normal serum electrolytes; Serum Antinuclear antibody and P-anti-neutrophil cytoplasmic antibody (ANCA) and C-ANCA were all negative; Rheumatoid factor: Negative

C-reactive proteins were elevated. Urinalysis showed: Albuminuria +++; 5-6 pus cells per high-power field; 18-20 RBCs (with no RBC casts). A CT scan of abdomen revealed increased cortical echotexture of both kidneys, fatty liver, minimal pleural effusions. 2D Echocardiography showed good LV/RV function, no LV regional wall motion abnormality, normal valves and chamber size.

A renal biopsy was carried out which showed features of acute tubule-interstitial nephritis (Fig 1).

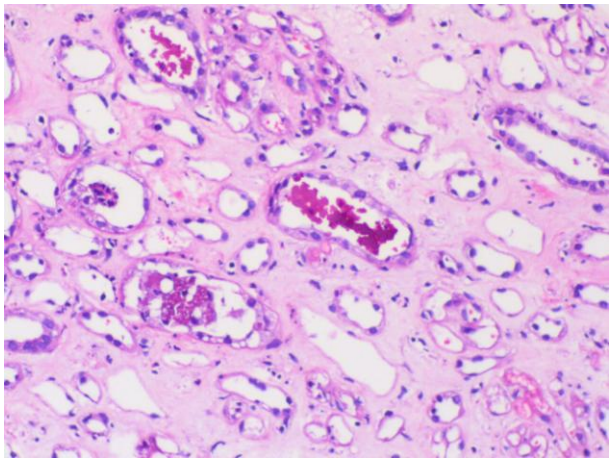

Fig 1. Simplification of tubular lining with single cell necrosis. RBCs and granular debris are seen in the tubal lumen

Meanwhile, she was placed on antibiotic cover (piperacillin-tazobactam), intravenous methyl prednisolone, and hemodialysed several times over the next few days, following which her urine output and fluid overload improved. She was discharged on oral methyl prednisolone with a serum creatinine of 3.4 and followed up in the OPD, whereupon she gradually improved.

Discussion

Drug induced AIN represents an important cause of acute renal failure, in hospital practice with drug-induced acute interstitial nephritis comprising around 15% of diagnoses obtained at renal biopsies in patients with acute renal failure. In most cases, antibiotics and non-steroidal anti-inflammatory drugs are the implicated agents. Among anti tubercular drugs, rifampicin is the most commonly associated with acute interstitial nephritis[3] and has been described in patients who are on intermittent or discontinuation of the drug[4].

Rifampicin induced AIN is a well characterized entity, with an incidence that in turn reflects the high prevalence of tuberculosis. Rekha et al report three cases of acute renal failure (probably rifampicin-induced) in about 8000 patients of pulmonary or extra- pulmonary tuberculosis who were treated with rifampicin[4].

Most serious renal reactions to rifampicin occur in patients who are taking rifampicin intermittently or in fact restart rifampicin after a period of stoppage[5]. One hypothesized mechanism for this is a quantum of antibodies “accumulates” during a break in rifampicin treatment when there is absence of the offending antigen. When rifampicin is restarted, an immune reaction of a higher order of magnitude occurs due to the enhanced stores of circulating antibodies[5]. The deposition of the immune complexes in the blood vessels or interstitium leads to glomerular endotheliosis with consequent tubular injury[6].

Muthukumar et al studied 25 consecutive patients with rifampicin-associated acute renal failure (ARF) and reported that rifampicin-associated ARF constituted 2.5% of all cases of ARF[6]. Most patients who developed ARF (40%) ingested a single dose preceded by a drug-free interval of 10 days to 6 years (after a prior course of daily rifampicin (range, 8 days to 18 months). These patients had gastrointestinal and flu-like symptoms which is in consistent with our findings (oliguric along with anemia and thrombocytopenia. 32% of their patients had acute hepatitis (similar to our patient). Of those who underwent kidney biopsy, 7 patients (58%) had acute interstitial nephritis (AIN). The study underlined the fact that no single feature at presentation predicted the severity of renal failure. The outcome was uniformly satisfactory with all patients recovering renal function.

Rifampicin induced tubule-interstitial nephritis is generally reversible provided the drug is withdrawn promptly and steroid therapy enhances renal recovery. Gonzalez et al studied the renal recovery following steroid therapy in drug-induced AIN in a retrospective analysis of 61 patients[7]. Eight five percent of their patients received steroids with 15% being treated conservatively. The investigators found a substantially lower need of chronic dialysis in those patients treated with steroids as compared to those who were not (3.8 vs. 44%; $P < 0.05$). A larger proportion of those patients who had a significantly long interval between withdrawal of the offending drug and starting steroid therapy had incomplete renal recovery function (34 ± 17 vs. 13 ± 10 days; $P < 0.05$). On multivariate analysis, in

those patients in whom steroids were started >7 after the injury had a 6-fold risk of developing chronic renal dysfunction. Similar results were shown by Muriithi AK[8]. On the other hand, Clarkson et al who followed up 26 of their steroid treated patients (among 42 with AIN) found no significant differences with steroid therapy[3]. However our patient received early steroid therapy with benefit.

Conclusion

Although rifampicin induced AIN is rare, the absolute numbers may be relatively high in those parts of the world where TB is rife. Physicians should always be aware to the possibility of anti-tubercular drug induced nephropathy in their patients who present with oliguria and flulike symptoms, and a renal biopsy is frequently to confirm the diagnosis. If treated in time with stoppage of the offending drug and possibly steroid therapy, the prognosis for renal recovery is usually excellent.

Acknowledgments: None

Conflict of interest: None

References

1. "Rifampin". The American Society of Health-System Pharmacists. (Last accessed August 1, 2015)
2. van der Meulen J, de Jong GM, Westenend PJ. Acute interstitial nephritis during rifampicin therapy can be a paradoxical response: a case report. Cases J 2009; 2:6643.
3. Clarkson MR, Giblin L, O'Connell FP, O'Kelly P, Walshe JJ, Conlon P, O'Meara Y, Dormon A, Campbell E, Donohoe J. Acute interstitial nephritis: clinical features and response to corticosteroid therapy. Nephro Dial Transplant 2004; 19(11):2778-2783.
4. Rekha VV, Santha T, Jawahar MS. Rifampicin-induced renal toxicity during retreatment of patients with pulmonary tuberculosis. J Assoc Physicians India 2005; 53:811-813.
5. Di Berardino L, Perna G, Silvestri LG. Antibodies against rifampicin in patients with tuberculosis after discontinuation of daily treatment. Am Rev Respir Dis 1976; 114(6):1189-1190.
6. Muthukumar T, Jayakumar M, Fernando EM, Muthusethupathi MA. Acute renal failure due to rifampicin: a study of 25 patients. Am J Kidney Dis 2002; 40(4):690-696.
7. González E, Gutiérrez E, Galeano C, Chevia C, de Sequera P, Bernis C, Parra EG, Delgado R, Sanz M, Ortiz M, Goicoechea M, Quereda C, Olea T, Bouarich H, Hernández Y, Segovia B, Praga M; Grupo Madrileño De Nefritis Intersticiales. Early steroid treatment improves the recovery of renal function in patients with drug-induced acute interstitial nephritis. Kidney Int. 2008; 73(8):940-946.
8. Muriithi AK, Leung N, Valeri AM, Cornell LD, Sethi S, Fidler ME, Nasr SH. Biopsy-proven acute interstitial nephritis, 1993-2011: a case series. Am J Kidney Dis. 2014; 64(4):558-566.