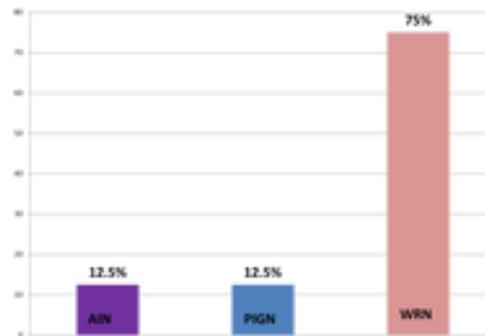


Nephropath Teaching Point 3: Warfarin related nephropathy



Last week's nephropath teaching point was a case of 40 year male , who underwent Mitral valve replacement 6 months ago and presented with acute kidney injury and hematuria. The most appropriate answer is Warfarin associated nephropathy, which was the most favoured answer as well (75% of respondents).

Warfarin related nephropathy (WRN) is a relatively recently described entity seen in patients receiving Warfarin, presenting with clinical features of acute kidney injury, acute derangement of INR and have histological findings of glomerular haemorrhage and large obstructive RBC casts in tubular lumina. The first report ([Abt et. al.](#)) recognized the occurrence of acute kidney injury and glomerular hematuria in association with Warfarin therapy, but the patient also had a thin basement membrane disease. Subsequently [Kabir et. al.](#) and later [Brodsky et al](#) reported few more cases of WRN in patients with underlying renal diseases (e.g. SLE, CKD) and clearly described the renal biopsy findings. Brodsky et. al. also developed an [animal model of the disease](#) and further extended their work and published a [large clinical study based on 15,258 patients with and without CKD who received Warfarin over a 5-year period, and found 4006 patients with INR over 3 and concurrent serum creatinine measurement. A presumptive diagnosis of WRN was made if the creatinine increased by more than 0.3mg/dl within 1 week after the INR exceeded 3 \(with no record of haemorrhage\). WRN occurred in 20.5% of the entire cohort, 33.0% of](#)

the CKD cohort, and 16.5% of the no-CKD cohort. Few important points emerged from this large study:

1. WRN is a relatively common occurrence in patients receiving Warfarin for various reasons.
2. An underlying renal pathology/disease need not be present for WRN to develop; about 16.5% patients with WRN in this study did not have an underlying CKD.
3. WRN can occur early in the course of Warfarin treatment and has no correlation with coagulation abnormalities associated with Warfarin use (i.e. coagulopathy usually is not required /or associated with development of nephropathy)
4. Patients with WRN have significantly reduced survival rates. The 1-year mortality in patients with WRN in this study was 31.1% with compared to 18.9% in those without WRN, an increased risk of 65%!!

AKI in patients receiving may also result from causes other than WRN including acute interstitial nephritis, vasculitis and interstitial nephritis and cholesterol embolization. The mechanisms of acute kidney injury in WRN include the altered glomerular hydrostatic pressure, direct glomerular toxicity of Warfarin, glomerular hemorrhage and obstruction of predominantly distal tubules by RBC casts.

While at this moment it appears prudent to perform regular estimations of serum creatinine in patients receiving Warfarin, more prospective clinical studies are needed to clearly establish the risk factors and accurately assess the impact of WRN on mortality in these patients.