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## The Bermuda Triangle: Chronic Kidney Disease, Contrast-Induced Nephropathy, and Atrial Fibrillation

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Several diseases and risk factors seem inter-related, but not always is a persistent correlation clear. In this article, I will review what the literature has to offer on the relationship between atrial fibrillation (AF) and the incidence of contrast induced nephropathy (CIN). Acute decline in renal function is a well-known complication after cardiac and radiologic procedures that require contrast administration (1, 2). Among patients undergoing percutaneous coronary intervention (PCI), CIN is associated with increased morbidity, mortality, and healthcare costs (3-5). In patients with abnormal renal function at baseline, the incidence of CIN can be as high as 42% (1, 6). CIN is the third most common cause of renal insufficiency in hospitalized patients and a major cause of morbidity and mortality (7). CIN may be defined as acute renal failure (ARF) that occurs within 24–72 h of exposure to I.V. or intra-arterial iodinated contrast media that cannot be attributed to other causes. In most cases it is a non-oliguric ARF with an asymptomatic transient decline in renal function (7). Various definitions of CI-AKI (contrast induced – acute kidney injury) have been used in the literature. The most widely used definition is the increase in serum creatinine  $\geq 0.5$  mg/dL or 25% increase of serum creatinine from the baseline value at 48 h after CM administration. However, timing of serum creatinine analysis after CM-enhanced imaging is controversial. Measurement as early as 12 h after the procedure (% change of creatinine from baseline) was found to significantly predict CI-AKI and furthermore it was associated with the development of renal damage after 30 days (8). Serum cystatin C levels have also been evaluated as an early marker of CI-AKI. In the study by Briguori et al (9) performed on CKD patients undergoing PTCA, increase of cystatin C levels  $\geq 10\%$  at 24 h after the procedure was found to reliably predict the patients with high risk of CI-AKI. In May 2002, the Acute Dialysis Quality Initiative (ADQI) group for the study of AKI, composed of nephrologists and intensivists, came together over 2 days in a conference in Vicenza (Italy), with the purpose of defining AKI. From this conference, the consensual RIFLE (Risk, Injury, Failure, Loss of kidney function, and End-stage kidney disease) classification for AKI definition emerged, which was published in May 2004 in *Critical Care* [10].

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