Correlation of Possible Kidney Injury in the Immediate Postoperative Period of Patients Having Undergone a Cardiac Surgery

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ABSTRACT

Cardiac surgeries nowadays are performing in a routine basis and most of the time with a great percentage of success. However, there are cases in operations that may appear postoperative complications such as renal dysfunction, which can endanger patient’s life. Preexisting isolated systolic hypertension and wide pulse pressure increase the risk of postoperative renal dysfunction in the cardiac surgery population. New data suggest that BP lability (i.e., BP excursions outside an acceptable physiologic range) during cardiac surgery may also be an important predictor of subsequent renal dysfunction. Alongside, various clinic parameters for example, the time spent in the unit, other postoperative complications etc. related to kidney injury have negative effects for the progress of patients’ suffering in the unit. The purpose of this study is the correlation between the appearance of kidney injury in patients undergoing a cardiac surgery the immediate postoperative period and other preoperative, intraoperative and postoperative parameters.

Keywords: Blood Pressure Lability, Cardiac Surgery, Isolated Systolic Hypertension, Kidney Injury, Renal Dysfunction

INTRODUCTION

Acute kidney injury (AKI) after cardiac surgery is a recognized and severe complication that generally occurs in 1-10% of patients. Patients who develop acute kidney injury have a greater risk for mortality rate (more usual to those undergoing hemodialysis). Data from studies show that even small changes in the rate of creatinine, after a heart surgery, are associated with significant effects on mortality. The cause of renal failure after cardiac surgery is not completely understood, but it is believed that an ischemic injury to the kidney, derived from inadequate perfusion, is an important factor, although kidney injury by exotoxins (antibiotics, anesthesia, diuretics) and endotoxins may also be related. As acute kidney injury (AKI)
in cardiac surgery patients defined an increase of postoperative creatinine >25% from the rate before surgery. The measures for the treatment of (AKI) is primarily preventive rather than therapeutic. The simple hydration preoperatively protects patients from the development of severe postoperative renal failure. Monitoring of fluid balance, of diuresis and renal function is of prodigious importance to the survival of cardiac patients, as the occurrence of postoperative acute kidney injury aggravates the prognosis (Vlachogiannis, 2009).

Renal disease occurs in a patient via two ways: as an incidental finding on routine examination or events with renal dysfunction, for example hypertension, edema, nausea, vomiting, hematuria, oliguria and anuria. According to epidemiological studies of chronic renal disease, it affects 10% of the population. The predominant causes of chronic renal failure are primary lesions diabetes, amyloidosis, the post-infection glomerulonephritis, virus of AIDS, the collagen diseases, the medicines, exposure to certain toxic substances and metals, chronic pyelonephritis, gout, some hereditary syndromes, diseases of the prostate, nephrolithiasis, the retroperitoneal fibrosis, hypertension, infectious causes, and the narrowing of the renal artery. Over 70% of cases of chronic renal failure in the final stage are due to diabetes or hypertension (Workman, 2008; Vander & Navar, 2003).

Diabetes is the most common cause of end stage renal failure. Diabetes often has no symptoms in early stages and many times has caused kidney damage before the initial diagnosis. The optimum regulation and early blood glucose is essential to prevent installation of kidney damage.

Hypertension is an important risk factor for renal failure and is often without symptoms. Recurrent correct measurement of arterial pressure during preventive medical examination is crucial, because early diagnosis and optimal regulation inhibits renal damage.

The stenosis of the renal artery is usually one of the manifestations of atherosclerotic occlusive vasculopathy. Smoking, excessive consumption of saturated fat are factors that cause atherosclerotic occlusive vasculopathy and should be avoided.

Uric acid is a substance produced in the body during the metabolism of purines and often increased blood without obvious symptoms. The hyperuricemia may be of nutritional origin, due to simple metabolic factors, may be associated with serious diseases, such as kidney disease, psoriasis, hypertension, hypothyroidism, hyperparathyroidism, alcoholism, obesity or be the result of unfavorable heredity. (Lemone & Burke, 2006; Porth, 2002)

It is worth enumerating some Indications and symptoms of kidney failure:

- Fatigue, lack of concentration, loss of appetite, sleep problems.
- Reduction of the amount of urine.
- Swelling especially around the eyes or on the face, wrists, abdomen, thighs or ankles.
- Problems of urination, abnormal flow during urination, change in the frequency of urination, especially at night.
- High blood pressure.
- Urine brown, foam or blood.

Higher levels of creatinine in the blood indicate diseases or conditions that affect renal function (Lemone & Burke, 2006; Urden, Stacy, & Lough, 2002).

EVALUATION OF RENAL FUNCTION

In order to evaluate properly renal function, apart from the rate of urea (20-50mg/dl) and the rate of creatinine in blood (0.7-1.5 mg/dl for men and 0.6-1.0 mg/dl for women), we must take into account the glomerular filtration rate and the amount of albumin excreted in urine. (8.9). The examination of creatinine is used in parallel with the examination of urea for evaluating renal function. Prices of creatinine in blood and urine can be used to calculate creatinine clearance. Measurement of serum creatinine (according to the age, weight and sex) is also used to calculate glomerular filtration rate that
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