Predictor of Acute Kidney Injury after Coronary Revascularization (Percutaneous versus Surgical)

Shaimaa Mostafa*, Heba Mansour, Tarek Aboelazem and Mohamed Youseri

Abstract

Background: Acute kidney injury is a well-known complication after surgical or percutaneous coronary revascularization, few publications have directly compared its risk in both techniques.

Aim: to compare the incidence and predictors of acute kidney injury after revascularization either by CABG or PCI.

Methods: This is a prospective, observational, non-controlled study included 300 patients presented to National Heart Institute from December 2014 to November 2015 with Multivessel CAD. All patients were subjected to demographic data analysis, clinical examination, echocardiography, baseline laboratory investigations and syntax score calculation. Follow up of kidney function by serum creatinine and eGFR within 48 hours.

Results: acute kidney injury occurred in 22% in CABG group, versus 9.3% in PCI group (P=0.003). Hemodilution was needed in one patient in CABG group vs no patients in PCI Group (p=0.511). Multivariate logistic regression analysis showed that Older age (P=0.010), increased BMI (P=0.037), dilated LV (P=0.049), lower Ejection Fraction (P=0.049) and blood transfusion (P<0.001) were independent predictors of AKI after CABG. While amount of contrast was independent predictor after PCI (P<0.001)

Conclusion: AKI is common after multivessel coronary revascularization and is more likely after CABG than after PCI. Predictors for AKI after CABG included older age, higher BMI, Dilated LV, lower EF and need of blood transfusion. Predictors for AKI after PCI included more amount of contrast.

Keywords
AKI; CAD; Revascularization

Introduction

CABG surgery was first performed in the 1960s by Kolesov and Favaloro and quickly became the principal modality for invasive treatment of CAD [1]. A decade later, Gruntzig introduced the less invasive alternative, (PCI) [2]. These 2 modalities remain the main invasive therapeutic options for coronary revascularization. During the past 4 decades, both technologies have undergone major advances resulted in excellent outcomes [3]. Consistent improvements in outcomes of PCI led to a wider usage, including those with more complex CAD.

Acute kidney injury (AKI) is a well-known complication after surgical or percutaneous coronary revascularization, ranging in prevalence between 1% and 30% depending on the study population and the definition of AKI [4]. The etiology of AKI in patients undergoing CABG includes intraoperative hypotension, postoperative complications that limit renal perfusion, atheroemboli, and reperfusion injury [5].

Regardless of the etiology, the presence of AKI is a predictor of poor outcomes after coronary revascularization. AKI is associated with increased risk for myocardial infarction, bleeding, dialysis, and poor short-term and long-term survival [5]. Patients who develop AKI not only have longer hospital stays and higher incidence of other peri procedural complications but also have a higher risk for long-term adverse outcomes, including chronic kidney disease (CKD), end-stage renal disease, and death [6]. Even a small increase in serum creatinine is associated with very poor survival [5].

Aim of the Work

To compare incidence and predictors of acute kidney injury after coronary revascularization either by surgical coronary artery bypass graft or by percutaneous coronary intervention.

Patients and Methods

Study design

This is a prospective, observational, non-controlled study included 300 patients presented to National Heart Institute in Cairo in the period from December 2014 to November 2015 with Multivessel CAD and were investigated for incidence and predictors of AKI after revascularization either by CABG or PCI and the patients were classified into 2 groups according to revascularization procedure. Group (A) patients had CABG and Group (B) patients had PCI.

Exclusion criteria were: patients with history of regular dialysis, history of renal transplantation, patients undergoing concomitant cardiac procedures at the time of CABG, patients with any prior coronary revascularization

Baseline evaluation

All patients had review of their medical history with special emphasis on the known predisposing factors of AKI including: age, BMI, hypertension, diabetes mellitus, previous myocardial infarction, dyslipidemia, preexisting impairment of renal function, history of Chronic obstructive pulmonary disease COPD, history of peripheral vascular disease PVD, general and cardiac examination, echocardiography for assessment of the LV end diastolic volume (LVEDV), LV end systolic volume (LVESV), LVEF using the modified simpson’s method, Diastolic Dysfunction, Mitral regurgitation, Syntax score was calculated for the coronary angiography and routine laboratory investigations including hemoglobin and serum creatinine with calculation of estimated glomerular filtration rate eGFR by CKD-EPI (Chronic Kidney Disease Epidemiology Collaboration equation).
Follow up

All patients were followed up for AKI measuring serum creatinine level, urine output within 48 hours after revascularization and Estimation of Glomerular filtration rate calculated by CKD-EPI.

Acute kidney injury defined by Acute Kidney Injury Network as (a) - Abrupt (within 48 h) reduction in kidney function currently defined as an absolute increase in serum creatinine of 0.3 mg/dL or more (≥26.4 μmol/L) or (b) - A percentage increase in serum creatinine of 50% or more (1.5-fold from baseline) or (c) - reduction in urine output (documented oliguria <0.5 mL/kg/h for >6 h) [7].

Statistical analysis

Data were collected, coded, revised and entered into the statistical package for social science (SPSS) version (20.0) and the following were done. Data are presented as mean ± SD for continuous data and as number (%) for categorical data. Between groups, analysis was done using student t-test for continuous data and Chi-square test (or Fischer exact test) for qualitative data. Level of evidence was detected to be significant at P value. Logistic regression analysis was used to assess the risk factors for AKI. The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value of <0.05 was considered significant. P value>0.05=Non-significant (NS), P value<0.05=Significant (S) and P value<0.01.

Results

Study population

In our study there was no significant difference between both CABG and PCI groups in baseline characteristics including personal characteristics (age, gender and BMI), risk factors (DM, HTN, Smoking, dyslipidemia, COPD and PVD history), prior MI, echocardiography data and SYNTAX score (P<0.05) as mentioned in Table 1.

Baseline kidney function, incidence of AKI and need for Dialysis:

There was no difference between two groups as regard to baseline kidney function where the mean creatinine was 0.92 ± 0.18 mg/dl for Group (A) versus 0.90 ± 0.14 for Group (B). And the mean GFR was 101.9 ± 18.21 ml/min/1.73 m² for Group (A) versus 103.4 ± 15.81 ml/min/1.73 m² for Group (B) (P=0.38 and 0.457 respectively).

Pre-existing renal impairment as eGFR<60 ml/min/1.73 m² among the two groups, two patients (1.33%) in group (A) versus no patients (0%) in Group (B) (p=0.156).

AKI according to AKIN definition occurred in 33 patients (22%) in CABG group, versus 14 patient (9.3%) in PCI group (P=0.003), as presented in Table 2. According to GFR after revascularization>60, There were 24 patients (16%) with GFR>60 in CABG group, while in PCI group, there was 11 patients (7.3%) (p=0.019) as presented in Table 2.

Hemodialysis needed in one patient (3.03%) with AKI in group (A) while no patients in Group (B) required dialysis (p=0.511) as presented in Table 2.

Comparison between baseline characteristics among patients with AKI in both groups

Both groups were of comparable age (P=0.128), gender (P=1.00) and BMI (P=0.337) as regard to risk factors only diabetes was statistically more prevalent in CABG group (P=0.037).

COPD

There were 13 patients with COPD (39.39%) in patients with AKI in group (A), while in patients with AKI in group (B), there were 3 patients with COPD (21.43%) (P=0.235).

PVD

There were 8 patients with PVD (24.2%) in patients with AKI in group (A), while in patients with AKI in group (B), there were 4 patients with PVD (28.6%) (P=0.731).

Echocardiography data

The mean EDV was 106.39 ± 16.40 for patients with AKI in Group A and 107.21 ± 16.02 for patients with AKI in Group B (P=0.875) and the mean ESV was 52.45 ± 9.33 for patients with AKI in Group A and 53.0 ± 16.83 for patients with AKI in Group B (P=0.927).

Patients with Diastolic dysfunction were 15 (45.5%) in patients with AKI in group A and 9 (64.3%) in patients with AKI in Group B (P=0.238).

Mean Ejection fraction was 52.15 ± 10.74% for patients with AKI in Group A and 51.57 ± 8.49 for patients with AKI in Group B (P=0.858).

Patients with mild mitral regurgitation were 13 (39.4%) in patients with AKI in group A and 5 patients (35.7%) in patients with AKI in Group B and 8 patients (24.2%) with moderate mitral regurgle in patients with AKI in group A versus 4 patients (28.6%) in patients with AKI in Group B (P=0.947).

Baseline creatinine

Regarding the patients' creatinine before undergoing intervention, the mean creatinine was 0.95 ± 0.24 mg/dl for patients with AKI in Group A and 0.92 ± 0.24 for patients with AKI in Group B (P=0.511).

Baseline GFR

Regarding the patients’ GFR before undergoing intervention, the mean GFR was 96.53 ± 21.80 ml/min/1.73 m² for patients with AKI in Group A and 103.0 ± 15.46 ml/min/1.73 m² for patients with AKI in Group B (P=0.320).

Table 1: Baseline characteristics of CABG group and PCI group.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>CABG group</th>
<th>PCI group</th>
<th>Test of sig</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>57.39 ± 7.47</td>
<td>56.18 ± 7.68</td>
<td>t=1.379</td>
<td>0.169</td>
</tr>
<tr>
<td>Male</td>
<td>129 (86.0%)</td>
<td>121 (80.7%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>21 (14.0%)</td>
<td>29 (19.3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td>28.89 ± 4.22</td>
<td>28.86 ± 4.18</td>
<td>t=0.055</td>
<td>0.478</td>
</tr>
<tr>
<td>DM</td>
<td>55 (36.7%)</td>
<td>50 (33.3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HTN</td>
<td>102 (68.0%)</td>
<td>103 (68.7%)</td>
<td>x²=0.842</td>
<td>0.359</td>
</tr>
<tr>
<td>Smoking</td>
<td>111 (74.0%)</td>
<td>104 (69.3%)</td>
<td>x²=0.804</td>
<td>0.370</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>114 (76%)</td>
<td>107 (71.3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COPD</td>
<td>41 (27.3%)</td>
<td>44 (29.3%)</td>
<td>x²=0.148</td>
<td>0.701</td>
</tr>
<tr>
<td>PVD</td>
<td>20 (13.3%)</td>
<td>19 (12.67%)</td>
<td></td>
<td>0.864</td>
</tr>
<tr>
<td>Previous MI</td>
<td>50 (33.3%)</td>
<td>46 (30.7%)</td>
<td>x²=0.245</td>
<td>0.621</td>
</tr>
<tr>
<td>EDV</td>
<td>99.68 ± 12.77</td>
<td>99.03 ± 13.49</td>
<td>t=0.426</td>
<td>0.670</td>
</tr>
<tr>
<td>ESV</td>
<td>44.97 ± 13.58</td>
<td>46.13 ± 13.54</td>
<td>t=0.737</td>
<td>0.462</td>
</tr>
<tr>
<td>EF</td>
<td>55.65 ± 7.85</td>
<td>54.21 ± 7.29</td>
<td>t=1.646</td>
<td>0.101</td>
</tr>
<tr>
<td>DD</td>
<td>55 (36.67%)</td>
<td>53 (35.33%)</td>
<td>x²=0.579</td>
<td>0.810</td>
</tr>
<tr>
<td>MR mild</td>
<td>67 (44.67%)</td>
<td>60 (40%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MR moderate</td>
<td>19 (12.67%)</td>
<td>18 (12%)</td>
<td>x²=1.646</td>
<td>0.101</td>
</tr>
<tr>
<td>Syntax score</td>
<td>26.77 ± 3.05</td>
<td>26.37 ± 3.14</td>
<td>t=1.138</td>
<td>0.256</td>
</tr>
</tbody>
</table>

SYNTAX Score

Regarding the coronary angiographic SYNTAX score, the mean score was 27.88 ± 3.43 mg/dl for patients with AKI in Group (A) and 27.43 ± 2.79 for patients with AKI in Group (B). (P=0.641) (Table 3).

Predictors of AKI after CABG: Multivariate analysis logistic regression showed that (Older age, increased BMI, dilated LV, lower Ejection Fraction and blood transfusion) were independent predictors of AKI after CABG Table 4.

Predictors of AKI after PCI: Multivariate analysis logistic regression showed that increased Amount of contrast was an independent predictor of AKI after PCI (P<0.001) as presented in Table 5.

Discussion

Incidence of AKI after CABG versus PCI

In our study there was no statistically significant difference between both CABG and PCI groups in baseline characteristics including personal characteristics (age, gender and BMI), risk factors (DM, HTN, Smoking, dyslipidemia, COPD and PVD history), prior MI, clinical data, echocardiography data, baseline labs (creatinine and hemoglobin) and SYNTAX score. This indicates no clinically relevant effect by these variables on incidence of AKI between both groups.

In our study the incidence of acute kidney injury according to Acute Kidney Injury Network (AKIN) criteria was 33 patients (22%) for CABG group versus 14 patients (9.3%) in PCI group (p value=0.003). AKI was significantly higher in CABG 2.4 times than PCI.

Our study findings are in agreement with Chang et al. [8] as they retrospectively analyzed results of two coplimentary cohorts 1- Kaiser Permanente Northern California (KPNC) cohort included 1,933 patients who underwent CABG and 1,004 patients who underwent PCI and found that CABG was consistently associated with 1.6 higher odds of AKI compared with PCI. 2- Medicare cohort included 52,578 patients who underwent CABG and 52,578 patients who underwent PCI and found that CABG was associated with 2.6 fold higher odds of AKI compared with PCI, and found that CABG was associated with a 2 to 3 fold significantly higher adjusted odds for developing AKI compared with PCI in both cohorts.

Also our results are also in agreement with Ben-Gal et al. [9] who reported that among 13,819 patients enrolled in the ACUITY trial, 5627 had multivessel disease and were managed by PCI (n 4,412) or CABG (n 1,215). The incidence of AKI (defined as a relative 25% increase or absolute 0.5 mg/dl increase in serum creatinine) was 31.7% after CABG and 14.2% after PCI (p=0.0001).

Our findings are in agreement with results of Farkouh et al. [10] who reported that acute kidney injury incidence was higher in CABG group than PCI group in their study from 2005 through 2010; enrolled 1900 patients at 140 international centers with diabetes and angiographically confirmed significant multivessel coronary artery disease. They found that acute renal failure requiring hemodialysis within 30 days after the index revascularization procedure was observed in 1 patient in the PCI group and 8 patients in the CABG (n 1,215). The incidence of AKI (defined as a relative 25% increase or absolute 0.5 mg/dl increase in serum creatinine) was 31.7% after CABG and 14.2% after PCI (p=0.0001).

But it was against results of Boudriot et al. [11] In this prospective, multicenter, randomized trial, 201 patients with ULM disease with
In our study we found that there was statistically significant difference between the non AKI and AKI groups of CABG patients regarding age and BMI (p>0.05) and we found that older age and increased BMI were strongly associated and independent predictors of AKI after CABG. It was in agreement with Warren et al. [12] who reported that AKI patients who developed AKI were older (mean 67 vs 64 years, p<0.0001). Also in agreement with Ng et al. [13] who found that the risk of developing AKI included older patient age (p=0.007) and also included larger body mass index (p=0.001).

In our study we found that there was no statistically significant difference between the two groups regarding gender (p=0.05). It was against results of Saxena et al. [14] who found that female gender was independently associated with a reduced risk of new renal failure (p=0.001) and this may be due to relatively small number of patients.

In our study we found that there was no statistically significant difference between non AKI and AKI groups of CABG patients as regard to diabetes mellitus, hypertension and previous history of myocardial infarction (p=0.05). It was in agreement with Ng et al. [13] who reported that diabetes mellitus was not independently associated with postoperative AKI (p=0.438). But was against Warren et al. [12] who reported that patients who developed AKI more likely to have diabetes (p=0.004) and hypertension (p=0.0006).

In our study we found COPD was not significantly associated with AKI after CABG (P=0.05) this was in agreement with Straten et al. [15] who reported that COPD was not associated with increased risk for AKI (P=0.056). But it was against Karkouti et al. [16] who reported that AKI was independently associated with COPD (P=0.007).

We found peripheral vascular disease is significantly associated with AKI (P=0.036). It was in agreement with Straten et al. [15] who studied a total of 10626 patients underwent isolated CABG surgery and followed up for AKI and reported that risk factors for AKI include PVD (P=0.029). But was against results of Karkouti et al. [16] who reported that AKI was not associated with PVD (p=0.3).

We found lower ejection fraction was an independent predictor of AKI after CABG (P 0.028) this was in agreement with Ranucci et al. [17] who studied 16,790 patients undergoing cardiac operations and could identify left ventricular ejection fraction as an independent predictors of AKI (p<0.001).

In our study we found that pre-existing renal is strongly associated with AKI (P=0.007). It was in agreement with Aronson et al. [18] who reported that significant risk factor for postoperative renal composite was preexisting renal disease (P>0.001). Also it coincides with Ranucci et al. [17] could identify eGFR as an independent predictors of AKI (P=0.001).

We found that patients with AKI had lower hemoglobin (P=0.001). It was in agreement with Warren et al. [12] who reported that patients who developed AKI had lower hemoglobin (13.9 ± 1.6 g/dL vs 14.2 ± 1.6 g/dL, p=0.008). Also it was in agreement with Straten et al. [15] who reported that Risk factors for the deterioration of renal function after surgical revascularisation include strongly low preoperative haemoglobin (P<0.0001). And in agreement with Karkouti et al. [16] who reported that AKI was strongly associated with preoperative anemia (P<0.0001).

---

**Table 4: Multivariate analysis logistic regression for predictors of AKI in CABG.**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>SE</th>
<th>Sig.</th>
<th>OR</th>
<th>95% CI UL</th>
<th>LL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>0.227</td>
<td>0.088</td>
<td>0.010*</td>
<td>1.254</td>
<td>1.055 - 1.491</td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td>0.228</td>
<td>0.109</td>
<td>0.037*</td>
<td>1.256</td>
<td>1.014 - 1.554</td>
<td></td>
</tr>
<tr>
<td>EF</td>
<td>1.588</td>
<td>0.811</td>
<td>0.049*</td>
<td>4.895</td>
<td>0.999 - 23.971</td>
<td></td>
</tr>
<tr>
<td>EF&lt;50</td>
<td>-1.550</td>
<td>3.838</td>
<td>0.686</td>
<td>0.212</td>
<td>0.000 - 392.542</td>
<td></td>
</tr>
<tr>
<td>HB</td>
<td>-0.760</td>
<td>0.423</td>
<td>0.072</td>
<td>0.468</td>
<td>0.204 - 1.071</td>
<td></td>
</tr>
<tr>
<td>Blood Transfusion</td>
<td>4.142</td>
<td>1.038</td>
<td>&lt;0.001</td>
<td>62.950</td>
<td>8.229 - 481.567</td>
<td></td>
</tr>
<tr>
<td>Bypass time</td>
<td>0.023</td>
<td>0.017</td>
<td>0.182</td>
<td>1.023</td>
<td>0.989 - 1.058</td>
<td></td>
</tr>
<tr>
<td>EDV</td>
<td>-0.696</td>
<td>0.388</td>
<td>0.036*</td>
<td>0.499</td>
<td>0.233 - 1.067</td>
<td></td>
</tr>
<tr>
<td>ESV</td>
<td>1.506</td>
<td>0.768</td>
<td>0.049*</td>
<td>4.507</td>
<td>1.000 - 20.322</td>
<td></td>
</tr>
<tr>
<td>SYNTAX</td>
<td>-0.214</td>
<td>0.304</td>
<td>0.481</td>
<td>0.807</td>
<td>0.445 - 1.464</td>
<td></td>
</tr>
<tr>
<td>PVD</td>
<td>-0.122</td>
<td>1.200</td>
<td>0.919</td>
<td>0.885</td>
<td>0.084 - 9.308</td>
<td></td>
</tr>
</tbody>
</table>

*B: Unstandardized Coefficients SE: Standard error of mean OR: Odds ratio CI: Confidence interval
LL: Lower limit UL: Upper Limit
*: Statistically significant at p<0.05

**Table 5: Multivariate analysis logistic regression for AKI in PCI.**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>SE</th>
<th>Sig.</th>
<th>OR</th>
<th>95% CI UL</th>
<th>LL</th>
</tr>
</thead>
<tbody>
<tr>
<td>DM</td>
<td>1.721</td>
<td>0.955</td>
<td>0.072</td>
<td>5.590</td>
<td>0.860 - 36.337</td>
<td></td>
</tr>
<tr>
<td>Amount of contrast</td>
<td>0.021</td>
<td>0.005</td>
<td>&lt;0.001</td>
<td>1.021</td>
<td>1.010 - 1.032</td>
<td></td>
</tr>
<tr>
<td>DD</td>
<td>1.406</td>
<td>0.103</td>
<td>0.176</td>
<td>4.079</td>
<td>0.532 - 31.279</td>
<td></td>
</tr>
<tr>
<td>EF&lt;50</td>
<td>-1.417</td>
<td>1.218</td>
<td>0.245</td>
<td>0.242</td>
<td>0.022 - 2.638</td>
<td></td>
</tr>
</tbody>
</table>

*B: Unstandardized Coefficients SE: Standard error of mean OR: Odds ratio CI: Confidence interval
LL: Lower limit UL: Upper Limit
*: Statistically significant at p<0.05

---


doi:10.4172/2324-8602.1000287
We found that patients who needed blood transfusion had AKI (p>0.001). Blood transfusion was independently associated with AKI after CABG. This in agreement with study by Khan et al. [19] who reported that total of 1210 adults underwent cardiac surgery. Receipt of 2 or more packed red blood cell units during cardiac surgery is associated with a greater risk of acute kidney injury. Also In agreement with Karkouti et al. [16] who found that AKI was independently and strongly associated with perioperative red blood cell transfusions (P<0.001) but Ng et al. [13] reported that blood transfusion was not independently associated with postoperative AKI (P=0.702).

We found that there was statistically significant difference between the non AKI and AKI groups of CABG group as regard to cardiopulmonary bypass CPB time (p<0.001). It was in agreement with Ranucci et al. [17] who identified increased duration of CPB as a strong risk factor of AKI (p<0.001). Ng et al. [13] also reported that factors that increased the risk of developing AKI included longer CPB time (p<0.001) but was against results of Schopka et al. [20] that concluded alternative findings, determining that duration of cardiopulmonary bypass was not a risk factor for the development of AKI after CABG.

In our study there was no statistically significant difference between the non AKI and AKI groups of CABG patients as regard to Off pump vs On pump (p<0.05). It was in agreement with results of Schopka et al. [20] that concluded that use of cardiopulmonary bypass was not a risk factor for the development of AKI after CABG. But was against Garg et al. [21] reported that off-pump CABG was associated with a reduced risk of postoperative AKI (P<0.01).

In the present study there was statistically significant difference between the non AKI and AKI groups of CABG patients as regard to inotropic drugs used (p>0.05). It was in agreement with Aronson et al. [18] reported that significant risk factor for postoperative renal composite was intraoperative multiple inotrope use (P>0.001).

Risk Factors of AKI after PCI

In our study we found that diabetes mellitus was significantly associated with AKI after PCI (P<0.001). It was in agreement with results of Tsai et al. [4] who reported that diabetes mellitus was strongly associated with AKI after PCI (p<0.001). Also it coincides with Evola et al. [22] who reported that diabetes mellitus is associated with a higher risk of contrast-induced nephropathy (p<0.001).

In our study we found that there was statistically difference between the Non AKI and AKI groups of PCI group as regard to Ejection Fraction <50% (p=0.15). It was in agreement with results of Eric et al. [23] who reported that risk predictors for CIN include abnormal left ventricular ejection fraction (LVEF) <50% (P=0.01).

In our study we found increased amount of contrast was strongly and independent predictor of AKI after PCI (p<0.001). It was in agreement with Evola et al. [22] who reported that higher contrast dose is associated with a higher risk of contrast-induced nephropathy (p<0.01). Also it coincides with Rihal et al. [24] who reported that Volume of contrast medium administered at the time of PCI was correlated with ARF (P=0.02).

We found that there was no statistically significant difference between the Non AKI and AKI groups of PCI as regard to COPD and PVD (P=0.495 and 0.078 respectively). It was against results of Tsai et al. [4] who reported that predictors for AKI include history of chronic lung disease (p<0.001). It was against results of Rihal et al. [24] who reported that independent correlates of ARF after PCI include the presence of peripheral vascular disease (P=0.001).

In our study we found there was no statistically difference between the non AKI and AKI groups of PCI patients as regard to patients' hemoglobin before undergoing intervention (p<0.05). It was against results of Tsai et al. [4] who reported that predictors for AKI include anemia (p<0.001)

Conclusion and Recommendations

1. AKI is common after multivessel coronary revascularization and is more likely after CABG than after PCI.

2. The risk for AKI should be considered when choosing a strategy for coronary revascularization especially in patients susceptible for renal impairment.

3. Predictors for AKI after CABG included older age, higher BMI, Dilated LV, lower EF and need of blood transfusion.

4. Ways to prevent AKI after CABG are needed for patients with these predictors.

5. Predictors for AKI after PCI included more amount of contrast.

6. Reducing amount of contrast should be considered during PCI.

Study Limitations

1. The relatively small sample size.

2. Single center study.

3. Lack of randomization.

4. Short period of follow up.

5. Emergency revascularization was not included in this study.

References


Submit your next manuscript and get advantages of SciTechnol submissions
- 50 Journals
- 21 Day rapid review process
- 1000 Editorial team
- 2 Million readers
- More than 5000 followers
- Publication immediately after acceptance
- Quality and quick editorial, review processing

Submit your next manuscript at www.scitechnol.com/submission

Author Affiliations
Faculty of Medicine, Cardiovascular Department, Benha University, Egypt