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CHADS2 in Diabetic Patient as a Predictor of Contrast Induced Nephropathy in Elective Coronary intervention

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Abstract: **Background**: Contrast induced nephropathy (CIN) is considered to be one of the record mutual main undesirable side effects of cardiac catheterization, and is concomitant with short- and long-term morbidity and mortality. The mode of inducing disease of CIN yet is not known completely in spite of some probabilities that CIN through inducing medullary hypoxia which leads to renal tubular damage. **Objective**: The aim of the study is to assess the efficacy of CHADS2 score in prediction of CIN in diabetic patient after elective coronary intervention. **Methodology:** This study was prospective cohort study conducted on 60 diabetic patients divided into two groups according CHADS2 score. All patients underwent elective percutaneous coronary intervention. All patients had the following: complete blood count, glycosylated hemoglobin (HbA1C), Resting 12-lead electrocardiography, Doppler – echocardiography. Serum creatininewas assessed at baseline, 24 hours after contrast media exposure in the coronary intervention. Creatinine clearance was assessed at baseline and 24 hours after the intervention. **Results:** CIN developed in 8 patients ((13.3%) one patient (2.6%) in CHADS2 score (1-2) group and 7 patients (33.3%) in CHADS2 score (>3) group. There are a significant positive correlation between the incidence of CIN and CHADS2 score. **Conclusion**: CHADS2 score is highly sensitive in diagnosis of contrast induced nephropathy after coronary intervention rather than old complicated scoring system.

Key words (Contrast induced nephropathy, CHADS2, coronary interference)

1. Introduction

One of the most complications following cardiac catheterization are the contrast-induced nephropathy (CIN) and acute kidney injury due to administration of contrast media [(1).]

The overall incidence of CIN in the world differs greatly in divers epopulations, it ranged from 7% to 25%, according to the presence of risk factors [(2/3)].

The development of CIN was accompanied with long stay in the hospital, increase in the rate of morbidity and mortality, and a long duration of renal damage (1), therefore, risk stratification is imperative, in order to give the suitable level of prophylactic policy in high-risk individuals.

Many protocols have been anticipated to expect the frequency of CIN.

One of the trials for designing a program for predilection of CIN complications was done by Mehran [(4)] who described a scoring system involved eight parameters, with fair relationship to the risk of CIN. Other investigators (Gurm, 2013) [(5)]who postulated a new plan including 15 parameters, which gave good discrimination of CIN rate than that reported previously by Mehran's score. Regardless of the precision, the mentioned scoring systems are generally inadequate due to their difficulty and need different inspections to comprehensive the risk stratification.

In case of embolic risk stratification in individuals suffering from atrial fibrillation patients, CHADS2 score is usually applied. Some of the parameters of CHADS2 score, comprises diabetes, age, and cardiac insufficiency, have too been considered as risk factors for CIN and adverse heart measures.

Recently some studies found that the CHADS2 score assistances in identification of patients complaining from acute myocardial infarction and classified as at a high risk with poor prognosis [(6)]Though, data about the application the CHADS2 score for predilection of CIN is restricted.

This study was aimed to explore the connection between CHADS2 score and risk of CIN in individuals who suffered elective PCI on diabetic patients.

Aim of the Work

This investigation was aimed to assess the efficacy of CHADS2 in prediction of CINin diabetic patients with normal serum creatinine after elective coronary intervention.

2. Patients and Methods

Our study was a prospective cohort study carried on cardiology department of Zagazig University during the period from December 2016 to May 2018 included 60 randomly selected patients who were admitted to coronary care unit for elective coronary intervention divided into two groups:

Group I: CHADS2 risk score (1-2) included 39 patients.

Group II: CHADS2 risk score (>3) included 21 patients.

Inclusion criteria:

Diabetic patient undergo elective coronary angiography, classified according to CHADS2 score.

Exclusion criteria:

Patients were excluded from the study if one or more of the following criteria were present.

Patients with chronic renal disease.

Patient with acute myocardial infarction.

Patient with atrial fibrillation.

Patients with malignancies.

All patients underwent the following:

1- Complete history taking:

Including age, sex, smoking, hypertension, dyslipidemia, diabetes mellitus, chronic kidney disease and other medical conditions.

2- Full clinical examination and cardiac assessment:

Heart rate, blood pressure, cardiac auscultation and peripheral Pulsation.

3-Electrocradiogram (ECG):

A 12-lead surface ECG was done for each patient on admission for diagnosis of ischemic changes or exclude new changed and STEMI.

4- Doppler – echocardiography:

For assessment of LV function by M- mode, regional wall motion abnormality.

5- Laboratory investigations:

Complete blood count (CBC) and random blood sugar and kidney function (serum urea, serum creatinine, creatinine clearance) before and after coronary intervention and glycosylated hemoglobin (HbA1C).

6-Calculating CHADS2 score:

Ages >75 years (1), HTN (1), DM (1), Heart failure (1), Previous stroke or TIA (2).

7- Percutaneous coronary intervention.

Statistical Analysis

Data were analyzed using Statistical Program for Social Science (SPSS) version 23. Quantitative data were expressed as mean ± standard deviation (SD). Qualitative data were expressed as frequency and percentage.

We the following tests of significance: Independent-samples t-test, Mann Whitney U test, Chi-square (X2) test, Fisher Exact test and Wilcoxon Signed-Ranks Test. Receiver operating characteristic (ROC) curve analysis was used to identify optimal cut-off values.

Sensitivity, specificity, PPV (positive predictive value), NPV (negative predictive value) was used to plot Receiver Operating Curve (ROC). Statistical significance was assessed at P values less than 0.05.

3. Results

Demographic Data of the Studied Groups

Regarding demographic data there was no statistically significant difference regarding the body weight, gender and smoking in our study. (Table1)

Regarding the age, patients in group I, their ages averaged 57.1 ± 9.4years, and ranged from 39 -77 years. While patients in group II their ages was averaged 68.4 ± 8.6years and ranged from 53-78 years.

The results revealed that there are a high significant differences between the two groups were recorded (Table1).

Table (1): Comparison between the studied groups regarding demographic data.

Demographic data	All patients	$CHADS_2$ group		Test	p-value (Sig.)
		Group I (score ≤2)	Group II (score >2)		
Count (%)	60 (100%)	39 (65%)	21 (35%)		
Gender					
Male	40 (66.7%)	25 (64.1%)	15 (71.4%)	0.330 ‡	0.566 (NS)
Female	20 (33.3%)	14 (35.9%)	6 (28.6%)		
Age (years)					
Mean ±SD	61.1 ± 10.6	57.1 ± 9.4	68.4 ± 8.6	-3.997 •	<0.001 (HS)
Median (Range)	60.5 (39 – 78)	56 (39 – 77)	68 (53 – 78)		
Weight (kg)					
Mean ±SD	86.3 ± 11.3	86.7 ± 11.6	85.5 ± 11.0	0.394 *	0.695 (NS)
Median (Range)	88.5 (64 – 115)	87 (66 – 115)	90 (64 – 100)		
Dyslipidemia					
	49 (81.7%)	33 (84.6%)	16 (76.2%)	0.647 [r]	0.493 (NS)
Smoking					
	22 (36.7%)	17 (43.6%)	5 (23.8%)	2.3‡	0.129 (NS)

p < 0.05 is significant. Sig.: significance.

The cardiovascular risk factors (CHADS2 score) in each group

Regarding hypertension, group I there were 19 patients hypertensive (48.7%) while in the group II there were 21 patients hypertensive (100%), With significant variations (P-value<0.001) between the two studied groups as seen in (Table2).

Regarding diabetes mellitus, group I there were 39 patients diabetic (100%) while group II there were 21 patients diabetic (100%). This variation was non-significantly varied (P=1.00) among groups I and II as demonstrated in (Table2).

Regarding congestive heart failure group I there were 2 patients with CHF (5.1%) while in group II there were 11 patients with CHF (52.4%), the results were significantly varied (P-value<0.001) between groups I and II as seen in (Table2).

Regarding history of stroke and TIA in-group I there was no patient has history of stroke (0%) while in-group II there was 6 patients with history of stroke (28.6%), the results were significantly varied (P-value<0.001) between groups I and II as seen in (Table2).

Regarding patient age > 75 years, group I there were 3 patients older than 75 years (7.7%) while in-group II there were 9 patients older than 75 years (42.9%). With significant variations (P=0.002) between the two studied groups as seen in (Table2).

Table (2): Comparison between the studied groups regarding demographic data.

Demographic data	All patients	$CHADS_2$ group		Test	p-value (Sig.)
		Group I (score ≤2)	Group II (score >2)		
Count (%)	60 (100%)	39 (65%)	21 (35%)		
CHF					
	13 (21.7%)	2 (5.1%)	11 (52.4%)	17.958[F]	<0.001 (HS)
HTN					
	40 (66.7%)	19 (48.7%)	21 (100%)	16.154‡	<0.001 (HS)
Age ≥ 75 years					
	12 (20%)	3 (7.7%)	9 (42.9%)	10.549[F]	0.002 (S)
DM					
	60 (100%)	39 (100%)	21 (100%)	<0.001‡	1.00 (NS)
History of stroke					
	6 (10%)	0 (0%)	6 (28.6%)	12.381[F]	0.001 (S)

p< 0.05 is significant. Sig.: significance.

ECG findings of the studied groups

Regarding ECG, in-group I there were 5 patients (12.8%) had no ECG changes, 18 patients (46.2%) had anterior wall ischemia, eight patients (20.5%) had lateral wall ischemia and eight patients (20.5%) had inferior wall ischemia.

While in-group II there were 0 patients (0%) had no ECG changes, 10 patients (47.6%) had anterior wall ischemia, one patient (4.8%) had lateral wall ischemia and 10 patients (47.6%) had inferior wall ischemia. (Table3)

Table (3): Comparison between the studied groups regarding ECG.

ECG	All patients	$CHADS_2$ group		Test	p-value (Sig.)
		Group I (score ≤2)	Group II (score >2)		
Count (%)	60 (100%)	39 (65%)	21 (35%)		
Normal	5 (8.3%)	5 (12.8%)	0 (0%)	8.299 ‡	0.04 (S)
Anterior changes	28 (46.7%)	18 (46.2%)	10 (47.6%)		
Inferior changes	18 (30%)	8 (20.5%)	10 (47.6%)		
Lateral changes	9 (15%)	8 (20.5%)	1 (4.8%)		

p< 0.05 is significant. Sig.: significance.

Abdominal sonographic and echocardiographic data findings of the groups.

Regarding Abdominal U/S, in-group I there were 34 patients (87.2%) had normal U/s while five patients (12.8%) had Nephropathy (I) in-group II there were 15 patients (71.4%) had normal U/s while 6 patients (28.6%) had Nephropathy (I).

There was a non-statistically significant difference between the two groups with (P-value=0.169). (Table4)

Regarding echocardiography, in group I the EF ranged from 35 to 72 % with mean 58.8 ± 6.7, in group II the EF ranged from 35 to 62 % with mean value 47.5 ± 9.1.

The main difference between the two groups was statistically highly significant (P < 0.001). (Table4)

Table (4): Comparison between the studied groups regarding abdominal sonographic and echocardiographic data.

U/S and echo	All patients	$CHADS_2$ group		Test	p-value (Sig.)
		Group I (score ≤2)	Group II (score >2)		
Count (%)	60 (100%)	39 (65%)	21 (35%)		
Abdominal U/S					
Normal	49 (81.7%)	34 (87.2%)	15 (71.4%)	2.262 F	0.169 (NS)
Nephropathy (I)	11 (18.3%)	5 (12.8%)	6 (28.6%)		
EF (%)					
Mean ±SD	54.9 ± 9.3	58.8 ± 6.7	47.5 ± 9.1	4.217 •	<0.001 (HS)
Median (Range)	56.5 (35 – 72)	60 (35 – 72)	42 (35 – 62)		

p< 0.05 is significant. Sig.: significance. Laboratory findings of the studied groups

Regarding serum creatinine Before PCI:-

In-group I the level of creatinine ranged from 0.65 to 1.5 mg/dl with mean 0.99 ± 0.26.

In-group II the level of creatinine ranged from 1.07 to 1.3mg/dl with mean value 1.07 ± 0.19, which pointed to a non-significant differences (P = 0.122) among groups I & II in the mean values. (Table5)

Regarding serum creatinine after PCI:-

In-group I the level of creatinine ranged from 0.7 to 2.2 mg/dl with mean 1.06 ± 0.35.

In-group II the level of creatinine ranged from 0.8 to 3.7mg/dl with mean value 1.51 ± 0.67. The average values between groups I & II was found to be significantly different (P = 0.001).

The main difference between creatinine level before and after PCI in-group I was found a high significant variations (p<0.001) as seen in (Table5).

In addition, the main difference between creatinine level before and after PCI in-group II was found a high significant variations (p<0.001) as seen in (Table5).

Regarding creatinine clearance Before PCI:-

In-group I the level of creatinine clearance ranged from 52 to 155 ml/min with mean 102.3 ± 32.1.

In-group II the level of creatinine clearance ranged from 51 to 154 ml/min with mean value 79.7 ± 24.2. The data pointed to a significant differences (P = 0.012) in the mean values between groups I & II as recorded in (Table 5).

Regarding serum creatinine clearance after PCI:-

In-group I the level of creatinine clearance ranged from 44 to 155 ml/min with mean 97.6 ± 33.5.

In-group II the level of creatinine clearance ranged from 24 to 118 ml/min with mean value 61.9 ± 22.8.

The data pointed to a highly significant differences (P < 0.001) in the mean values between groups I & II as recorded in (Table 5).

The main difference between creatinine clearance before and after PCI in-group I as recorded in the table pointed to a highly significant variations (p<0.001).

In addition, the main difference between creatinine clearance before and after PCI in-group II as recorded in the table pointed to a highly significant variations (p<0.001).

Regarding HBA1c:-

In-group I HBA1c ranged from 6.9 to 9.7 % with mean 7.56 ± 0.57.

In-group II HBA1c ranged from 7.0 to 9.2 % with mean value 7.81 ± 0.58.

The data revealed to a significant differences (P =0.042) among tested groups (I & II) as recorded in table 5.

PCI data of the studied groups

Regarding contrast volume (ml), in-group I the volume ranged from 125 to 350 ml with mean 232.1 ± 63.9, in-group II the volume ranged from 150 to 400 ml with mean value 272.6 ± 76.6. It is observed that no significant differences (P =0.052) was found between the two groups (Table6).

Regarding radiation time (min), in-group I the time ranged from 20 to 60 min with mean 31.2 ± 10.1, in-group II the time ranged from 20 to 65 min with mean value 35.2 ± 11.9.

The main difference between the two groups was statistically non-significant (P =0.189). (Table6)

Regarding incidence of CIN, group I there were 1 patient with CIN (2.6%) while in the group II there were 7 patients with CIN (33.3%).

There was a statistically significant difference between the two groups with (P-value=0.002). (Table6).

Logistic regression analysis for CHADS2 score to CIN.

There is an increase of one point in the CHADS2 score is associated with a 573.8% significant increase the incidence of CIN [odds ratio (OR) =6.738; 95% confidence interval (C.I) = 2.027 - 22.399; p=0.002]. (Table 7).

Table (5): Comparison between the studied groups the laboratory data.

Laboratory data	All patients	$CHADS_2$ group		Test	p-value (Sig.)
		Group I (score ≤2)	Group II (score >2)		
Count (%)	60 (100%)	39 (65%)	21 (35%)		
Serum creatinine (mg/dl)					
Before PCI					
Mean±SD	1.02 ± 0.24	0.99 ± 0.26	1.07 ± 0.19	-1.547 •	0.122 (NS)
Median (Range)	1.0 (0.65 – 1.5)	0.9 (0.65 – 1.5)	1.1 (0.7 – 1.3)		
After PCI					
Mean±SD	1.22 ± 0.52	1.06 ± 0.35	1.51 ± 0.67	-3.261 •	0.001 (S)
Median (Range)	1.1 (0.7 – 3.7)	1.0 (0.7 – 2.2)	1.3 (0.8 – 3.7)		
Test	-5.356 ₩	-3.952 ₩	-3.634 ₩		
p-value (Sig.)	<0.001 (HS)	<0.001 (HS)	<0.001 (HS)		
Creatinine clearance (mL/min)					
Before PCI					
Mean±SD	94.4 ± 31.3	102.3 ± 32.1	79.7 ± 24.2	2.519 •	0.012 (S)
Median (Range)	85 (51 – 155)	97 (52 – 155)	75 (51 – 154)		
After PCI					
Mean±SD	85.1 ± 34.5	97.6 ± 33.5	61.9 ± 22.8	3.643 •	<0.001 (HS)
Median (Range)	77 (24 – 155)	97 (44 – 155)	63 (24 – 118)		
Test	5.309 ₩	3.903 ₩	-3.624 ₩		
p-value (Sig.)	<0.001 (HS)	<0.001 (HS)	<0.001 (HS)		
HbA1c (%)					
Mean±SD	7.64 ± 0.58	7.56 ± 0.57	7.81 ± 0.58	-2.037 •	0.042 (S)
Median (Range)	7.5 (6.9 – 9.7)	7.4 (6.9 – 9.7)	7.8 (7.0 – 9.2)		

p< 0.05 is significant. Sig.: significance.

Table (6): Comparison between the studied groups regarding PCI data.

PCI data	All patients	$CHADS_2$ group		Test	p-value (Sig.)
		Group I (score ≤2)	Group II (score >2)		
Count (%)	60 (100%)	39 (65%)	21 (35%)		
Contrast volume (mL)					
Mean±SD	246.3 ± 70.7	232.1 ± 63.9	272.6 ± 76.6	-1.941 •	0.052 (NS)
Median (Range)	225 (125 – 400)	225 (125 – 350)	275 (150 – 400)		
Radiation time (min)					
Mean±SD	32.6 ± 10.8	31.2 ± 10.1	35.2 ± 11.9	-1.315 •	0.189 (NS)
Median (Range)	30 (20 – 65)	30 (20 – 60)	35 (20 – 65)		
N. of vessels					
One vessel	40 (66.7%)	29 (74.4%)	11 (52.4%)	3.398 ‡	0.183 (NS)
Two vessels	17 (28.3%)	8 (20.5%)	9 (42.9%)		
Three vessels	3 (5%)	2 (5.1%)	1 (4.8%)		
Incidence of CIN					
	8 (13.3%)	1 (2.6%)	7 (33.3%)	11.18^F	0.002 (S)

p< 0.05 is significant. Sig.: significance.

Table (7): Univariatelogistic regression analysis for CHADS2 score to CIN.

CIN incidence (odds ratio)	Intercept	Standard error	Wald	Degree of freedom	Sig.	Odds ratio	95% C.I for odds ratio	
							Lower	Upper
$CHADS_2$score	1.908	.613	9.687	1	.002	6.738	2.027	22.399
Constant	-7.378	2.009	13.489	1	.000	.001		

Multiple logistic regression analysis for different factors to CIN

A multivariate logistic regression model was performed to ascertain the effects of CHADS2 score, radiation time, contrast volume and age on the likelihood that participants would have CIN. The result showed that CHADS2 score is an independent predictor for incidence of CIN [odds ratio (OR) =8.111; 95% confidence interval (C.I) = 1.096 – 60.011; p=0.04]. (Table8)

Table (8): Multiplelogistic regression analysis for different factors to CIN.

CIN incidence (odds ratio)	Intercept	Standard error	Wald	Degree of freedom	Sig.	Odds ratio	95% C.I for odds ratio	
							Lower	Upper
$CHADS_2$score	2.093	1.021	4.202	1	.040	8.111	1.096	60.011
Radiation time	-.095	.124	.588	1	.443	.909	.713	1.160
Contrast volume	.047	.026	3.181	1	.075	1.048	.995	1.104
Age ≥75 years	-.252	2.008	.016	1	.900	.777	.015	39.804
Constant	-18.551	7.097	6.832	1	.009	.000		

ROC curve analysis regarding CIN

ROC curve analysis was done to pick up the best cut off value of CHADS2 risk scores and incidence of CIN which revealed CHADS2 risk score more than 3 with sensitivity 62.5 % and specificity 96.2% Area under the curve 0.895 (P-value <0.001). (Table 9) (Figure 1).

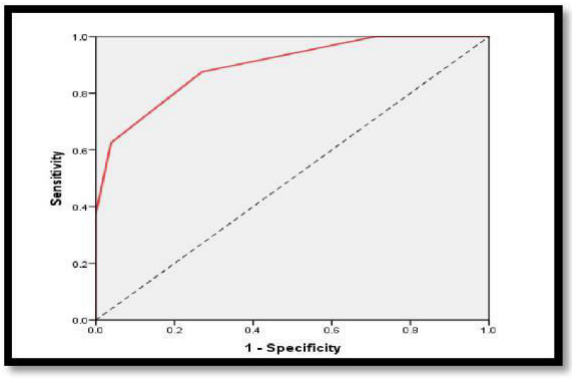

Figure (1): ROC curve analysis

Table (9):CHADS2 score as predictor for incidence of CIN; ROC curve analysis

Cut-off value	Sensitivity %	Specifity %	PPV %	NPV %	Accuracy	AUROC	p-value
CHADS2 score> 3	62.5%	96.2%	71.4%	94.3%	91.7%	0.895	<0.001 (HS)

ROC curve: Receiver Operating Characteristic curve.

4. Discussion

The progress of imaging tools and interventional processes which including giving of intravascular contrast media in different conditions such as non-cardiac modalities (e.g., interventional vascular angiography and vascular CT angiography) and in established (e.g., PCI and coronary angiography) and emergent cardiac modalities (e.g., trans catheter aortic valve implantation (TAVI) and CT coronary angiography) which increased steadily in the recent years and thus increased the number of patients which exposed to contrast media and in the same time increase the number of patients at risk of CIN. [7].

CIN is associated with a marked increase in hospital morbidity and mortality rates. [8].

In spite of the great advances in the technological tools and procedures, the rate of acute renal damage is still representing about the third of all kidney-hospital cases due to CIN [9], and disturbs.from 1% and 2% of the general peoples and up to 50% of high-risk subgroups after percutaneous coronary intervention or coronary angiography. [10].

Methods for identification of patients at risk for CIN is the main goal for most of researches to avoid the undesirable events. In spite of the pathogenesis of CIN is not fully known, investigators established that

(11).

CIN is induced by vasoconstriction in the renal tubules and tissues, injury in the endothelial membrane or dysfunction, damage in the endothelial cells, followed by renal tubular damage and medullary hypoxia

In addition, many factors are well-known as a risk factors for CIN such as female gender, advanced age, CHF, diabetes mellitus, and renal failure (12).

Even hypertension and high central pulse pressure have been reported to be linked to CIN development (13).

The components of the CHADS2 and CHA2DS2-VASC score include similar risk factors for CIN (10).

The CHADS2 score, which was initially developed for stroke risk stratification in patients with AF, is a suitable scoring system for estimating the difficulty of co-morbidities in patients with cardiovascular diseases (14).

There is inadequate data of the benefit of the CHADS2 score in patients suffer PCI and rate of CIN, but the contents of the CHADS2 score are all conceder risk factors for progress of CIN (4).

The aim of our study was to assess whether the CHADS2 score provide potentially valuable prognostic information's on incidence of CIN.

Our study was conducted on 60 diabetic patients with normal serum creatinine undergoing elective PCI divided into two groups according to their CHADS2 score.

Serum creatinine was assessed before and after (within 48 hours) contrast media exposure in the elective PCI.

Demographic data:

In our study conducted on 60 patients with mean age 61.1 ± 10.6 years and mean body weight 86.3 ± 11.3kg divided into:-

Group I CHADS2 risk score (1-2) the mean age was 57.1 ± 9.4 years.

Group II CHADS2 risk score (>3) the mean age was 68.4 ± 8.6 years.

There was statistically highly significant difference between both CHADS2 risk score groups ($p<0.001$). This was in agreement with Puurunen et al., (2014) (15) who found that there was a highly statistically significant difference regarding Age ($p<0.001$).

There was no statistically significant difference between both groups regarding the body weight which was 86.7 ± 11.6 kg in Group I and 85.5 ± 11.0 kg in Group II.

According to sex our study included 60 patients 20 (33.3%) female and 40 (66.6%) male divided into:

Group I 14 female (35.9%) and 25 male (64.1%).

Group II 6 female (28.6%) and 15 male (71.4 %).

There was no significant difference between CHADS2 groups ($p>0.05$) regarding sex. This was in disagreement with James et al., (2010) (16) which examine the association between AKI following coronary angiography, they found that males were 69.9% in the low risk CHADS2 group compared to 57.7% in high risk group ($p=0.007$). This discrepancy between the previous study and our results regarding sex could be due to small sample size in our study and could also be due to the fact that their study record long-term changes in kidney function.

Clinical data and risk factors:

In our study, there was a statistical significant difference regarding hypertension (19 patients in group I and 21 patients in group II), history of stroke (6 patients in group II with no patients in group I) and Congestive heart failure (2 patients in group I and 11 patients in group II) between the two groups which was concordant with Chou et al., (2016) (17), in which 539 patient underwent coronary angiography and intervention divided according to CHADS2 score, While there was no statistically significant difference concerning diabetes between both groups and this was against the result of Chou et al., 2016(17).

Regarding to serum creatinine:

Before PCI:

It was 0.99 ± 0.26 mg/dl Group I while in Group II it was 1.07 ± 0.19 mg /dl with no statistically significant difference between both groups which was concordant with (shukla AN et al, 2017) (18) in which, 253 patients underwent coronary angiography and/or percutaneous coronary intervention and stated that the mean serum creatinine rise was non-significant.

48 hours after PCI:

It was 1.06 ± 0.35 mg /dl in group I and 1.51 ± 0.67 mg /dl in group II with statistically significant difference between both groups which was concordant with Chouetal 2016(17).

In both group I and group11 there was highly statistical significant difference between levels of serum creatinine before after PCI.

Although all patients were diabetic but there was a statistical significant difference between both groups regarding HbA1C.

There was no statistically significant difference between both groups regarding dyslipidemia and smoking which was concordant with (Ashalatha et al, 2017) (19).

There was statistically significant difference between both groups regarding the mean volume of contrast media, radiation time and angiographic findings.

In our study, increased mean volume of CM in PCI was associated with higher incidence of CIN which was concordant with the study of Marenzi et al., (2009) [20] which assessed the association between the contrast volume and the incidence of CIN in 561 patients with STEMI underwent Primary PCI.

The incidence of CIN was 13.3% (8 patients) which was in agreement with Merenzi et al., (2004) [7] in which 208 patients presented with acute myocardial infraction underwent Primary PCI the incidence of CIN was 19%, and disconcordant with Shacham et al., (2016) [21] in which the incidence of CIN was 6.2%.

In our study, CHADS2 score > 3 is a predictor for the incidence of CIN with sensitivity 62.5%, specificity of 96.2% and accuracy of 91.7%.

Conclusion

CHADS2 score is highly sensitive in diagnosis of contrast induced nephropathy after coronary intervention rather than old complicated scoring system.

Recommendation

This study recommends using CHADS2 score as a diagnostic tool for contrast induced nephropathy in patients undergoing elective PCI.

Limitations of the study

1-Relatively small sample size of this study.

2-The results were obtained from only two centers.

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