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Research Article

EFFECT OF ASPIRIN COMBINED WITH CLOPIDOGREL FOR THE TREATMENT OF THE PATIENTS OF ACUTE MYOCARDIAL INFARCTION WHO UNDERWENT PERCUTANEOUS CORONARY INTERVENTION

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Abstract:

Objective: The purpose of this research was to examine the clinical influences of aspirin in combination with clopidogrel for the patients of AMI (Acute Myocardial Infarction) who underwent PCI (Percutaneous Coronary Intervention).

Methodology: Total 132 patients suffering from Acute Myocardial Infarction who got admission in Lahore General Hospital Lahore from May 2019 to June 2020, were separated into observation group (OG) and control group (CG) with sixty-six patients in each group. We gave symptomatic therapy and emergency PCI to the patients of both groups. The patients of CG received aspirin according to conventional treatment prior and after surgery, whereas the patients of OG received the clopidogrel therapy in combination with the treatment provided to the patients of CG. The duration of the treatment was complete four months. We analyzed the clinical effectiveness in the patients of both groups. We also provided the comparison of the indicator of cardiac function, coagulation indicator and prevalence of the adverse side effects prior and after the treatment.

Results: We found no thrombosis at infarct site in the patients of both groups in coronary angiography after completion of therapy. Efficacy rates in the patients of OG & CG were 89.40% and 81.80% correspondingly; we found no significant difference in the rates of efficacy of both groups. The rate of occurrence of the re-thrombosis in the patients of OG & CG was 1.50% and 12.10% respectively, which was much lower in the patients of OG as compared to the patients of CG ($P < 0.050$). There was improved cardiac function indicator in the patients of both groups after the treatment, particularly in the OG ($P < 0.050$). We found no important difference in the PT (Prothrombin Time), APTT (Activated Partial Thromboplastin Time), PA (Prothrombin Activity) and PAR (Platelet Aggregation Rate) in the patients of both groups prior treatment ($P > 0.050$). We found no significant difference PA & PT prior & after the therapy ($P > 0.050$). There was high difference in PAR & APTT after therapy ($P < 0.050$) and PAR of the patients of OG was much high as compared to the patients of CG ($P < 0.050$). The rate of prevalence of the adverse reactions in the patients of OG was 7.580%, which was not much different from that which was present in the patients of CG as 12.120% ($P < 0.050$).

Conclusion: Aspirin in combination with clopidogrel can decrease the prevalence of occurrence of re-thrombosis effectively after PCI and it also has the ability to improve the cardiac function after surgery, the safety of this treatment is also very high. This treatment procedure has important clinical worth.

Keywords: Acute Myocardial Infarction, Cardiac, Aspirin, Coronary, Clopidogrel.

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INTRODUCTION:

Myocardium's partial acute necrosis by severe and persistent myocardial ischemia is known as Acute Myocardial Infarction. A few patients can also suffer from shock, arrhythmia and failure of heart which much seriously endangers the lives of subjects [1, 2]. There is rapid increase in coronary atherosclerotic diseases of heart with the improvements in the standards of lives and changing in life styles [3, 4]. In current era, standard treatment for the patients of Acute Myocardial Infarction is PCI, which can give relief to the patients of this complication [5, 6].

Most of the research work in this field have stated that there is more propensity of acquiring re-thrombosis in the patients of Acute Myocardial Infarction after getting PCI [7,8]. So, it is very important to get post-PCI anti-thrombotic treatment. Recently, there is common use of aspirin in the clinical field, but its clinical application is much limited due to its high variability and slow onset [9]. In this current research work, we recruited total one hundred and thirty-two patients suffering from Acute Myocardial Infarction to examine the clinical effectiveness of aspirin in combination with clopidogrel after receiving PCI.

METHODOLOGY:

The subjects of this research work were 132 patients suffering from Acute Myocardial Infarction who got admission in our Lahore General Hospital Lahore from May 2019 to June 2020. All the patients fulfilling the diagnostic standard of Acute Myocardial Infarction [10] and duration of Acute Myocardial Infarction not greater than twelve hours, having indication of PCI and Killip Grade I-II of cardiac function, were the participants of this research study. All the patients having other serious complication or in instable state were not included in this research study. We divided the patients into 2 groups with sixty-six patients in each group. In OG (Observation Group), there were forty-two males and twenty-four females having 45 to 81 years of age with an average age of 62.450 ± 11.390 years.

Duration between the symptoms onset and outpatient was from one to twelve hours with an average duration of 3.17 ± 1.46 hours. Twenty-nine patients were in Grade-I and 37 patients were in Grade II of the cardiac function. There were 39 males and twenty-seven females in the CG (Control Group). The range of the age of these patients was from 46 to 81 years with an average age of 62.720 ± 12.260 years. The duration between the symptoms onset and outpatient was from 1 to 12 hours with an average duration of 3.24 ± 1.37 hours. Twenty-six patients were in Grade-I and forty patients were in Grade-II of the cardiac function. We obtained the approval of the ethical committee of the institute for the conduction of this research work. We also obtained the written consent from all the patients after explaining them the purpose of this research work.

All the patients underwent PCI in complete guidance of angiography and got conventional drug treatment related with this procedure. We gave the 300mg aspirin to the patients of CG just after the admission. We performed the emergency PCI. After surgical intervention, injection of 5000U heparin sodium with low molecular weight to the patients one time in every twelve hours for complete 5 to 7 days. We infused intravenously $15 \mu\text{g}/\text{kg}$ mirtirofiban hydrochloride, for twenty-four hours. Besides this, patients also took aspirin of 100mg one time in a day. This duration of this treatment was complete four months. The patients of OG obtained the 600mg tablets of clopidogrel bisulfate just after the admission. Then we performed emergency PCI. While performing the surgery, we intravenously injected the heparin for anti-coagulation. After the completion of surgical intervention, we subcutaneously injected 5000U of heparin sodium with low molecular weight, one time in twelve hours for 5 to 7 days. We infused $15.0 \mu\text{g}/\text{kg}$ mirtirofiban hydrochloride intravenously for twenty-four hours much similar to the patients of CG. Besides this, patients also obtained tablets of 75mg clopidogrel bisulfate & 100mg of aspirin on regular basis. This treatment was also continued for four months. We

also observed the findings of electrocardiography and angiography for observation and then evaluated the clinical effects of both groups. We assessed the ST segment after the surgery for acknowledgement of the curative effect. We also assessed the incidence of the re-thrombosis in the patients of both groups with the utilization of coronary angiography. We observed the improvement regarding cardiac function in the patients of both groups. We also compared the prevalence of adverse side effects between the patients of both groups. The processing of the data carried out with the utilization of the SPSS V.21. We presented the measurement data in averages and

standard deviations and its processing was carried out with the help of T test. Significant P value was less than 0.050.

RESULTS:

Thrombosis was not present at infarct site in the patients of both groups after coronary angiography. Total rate of effectivity of the patients of OG and CG was 89.40% and 81.80%, respectively but it was not significant statistically. The prevalence of re-thrombosis in the patients of OG was much low as compared to the patients of CG (1.50% vs. 12.10%) ($P < 0.050$, Table-1).

Table-I: Clinical Efficacy and Incidence of Re-Thrombosis [n (%)]

Group	Observation Control	X ²	P group	group
Significantly effective	39(59.1)	35(53.0)		
Effective	20(30.3)	19(29.8)		
Ineffective	7(10.6)	12(18.2)		
Overall effective rate	59(89.4)	54(81.8)	0.0216	>0.05
Incidence of re-thrombosis	1(1.5)	8(12.1)	9.9731	<0.05

Prior treatment, there was no important disparity in the LVESD & LVEDD between the patients of both groups ($P > 0.050$). But after the therapy, there was significant decrease of LVESD & LVEDD in OG as compared to CG and this difference was also much significant ($P < 0.050$, Table-2). We found no

significant disparity in the PTT, PT, PAR and PA between the patients of both groups before the start of therapy ($P > 0.050$). We found no significant difference in PA & PT after the completion of treatment.

Table-II: Cardiac Function Indicators Between the Two Groups Before and After Treatment

Group		Observation group	Control group
LVEDD	Before treatment	69.50±9.86	69.45±9.91
	After treatment	47.00±7.51*#	68.01±8.49
LVEDD	Before treatment	58.00±10.51	57.96±10.54
	After treatment	36.05±7.50*#	56.00±10.55

Note: * indicated $P < 0.05$ compared to before treatment; # indicated $P < 0.05$ compared to the control group.

We found a significant disparity in PAR and APTT between the patients of 2 groups before therapy ($P < 0.050$). PAR of the patients of OG was much high as compared to the patients of CG ($P < 0.050$, Table-3). During therapy, there was presence adverse reactions in 5 patients, including 2 patients of vomiting and nausea, one patient was present with epigastric discomfort, one patient was present with rash and one patient had severe headache (7.580%, 5

out of 66) and eight patients in the OG were present with adverse reactions, including three patients with vomiting/nausea, one patient had severe headache, two patients were present with severe pain in abdomen and two patients were suffering from rash (12.120%, 8 out of 66). We found no statistically significant difference in prevalence rate of adverse reactions between the patients of both groups ($X^2 = 0.4470$, $P < 0.050$).

Table-III: Coagulation Indicators and Platelet Aggregation Rate

Group		Observation group	Control group
PT	Before treatment	11.32±2.68	11.24±2.57
	After treatment	12.01±3.38	11.59±3.41
APTT	Before treatment	33.61±5.63	33.52±5.87
	After treatment	39.44±6.57*	39.21±6.18*
PA	Before treatment	0.88±0.06	0.89±0.07
	After treatment	0.89±0.07	0.89±0.08
PAR	Before treatment	0.58±0.08	0.59±0.07
	After treatment	0.46±0.08*#	0.33±0.06*#

Note: * indicated P<0.05 compared to before treatment; # indicated P<0.05 compared to the control group.

DISCUSSION:

Background of the pathology of Acute Myocardial Infarction is the unstable plaque, rupture of the coronary artery. The symptoms of this disease may occur; there is progress of thrombogenesis to a specific stage. The most common principle for clinical therapy of Acute Myocardial Infarction is to open the associated infarct vessels very soon for the improvement in the recovery of flow of myocardial blood and thus rescuing the dying myocardium [11,12]. One of the effective measures for the Acute Myocardial Infarction is the emergency PCI [13]. Trauma is mild in the emergency PCI, rate of opening of the infarct vessels is higher than 90.0% [14]. In the procedure of PCI, stent implantation, balloon dilatation and other associated instruments are also required which can exert the pressure on the side walls of artery and leads to induction of intima and plaque rupture and thus injury of coronary artery. Media and intima damage of the coronary artery can cause the activation of platelets and promotion of the adhesion of platelet as well as aggregation to form the thrombus [15,16].

Aspirin's anti-platelet mechanism is to form the arachidonic acid drop its skill to change into prostaglandin endo-peroxide and restricting the production of the prostaglandin E₂ & thromboxane A₂ through mitigating the activity of the cyclooxygenase inside the platelets [17]. The results of one research work showed that there can be existence of aspirin resistance in some patients though there is good therapeutic influence of the aspirin in treating v [8]. But aspirin has no ability to decrease the acute thrombotic incidents in its clinical application. One of the effective anti-platelet drugs is clopidogrel. It has the ability to inhibit the aggregation of blood platelets and reduction of thrombus [17]. One research stated that there was no impact of the aspirin on the inhibition of aggregation adenosine diphosphate-induced platelet when used in combination with the clopidogrel. Improvement in

the index of cardiac function in OG was much better as compared to the patients of CG which is comparable with the findings of Xiao. This showed that combined treatment of these drugs has the ability to improve the cardiac function of the patients suffering from Acute Myocardial Infarction.

CONCLUSION:

Keeping in view the traits of Acute Myocardial Infarction, there is better clinical efficacy of aspirin in combination with clopidogrel as compared to aspirin alone. This treatment is much beneficial in the improvement of the cardiac function of the subjects. There was also very low prevalence of the adverse side effects and complications. There was also very high safety of this treatment. Only limitation of this research work was the small size. There is need of further research works with large sample sizes to consolidate the findings of this research work.

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