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Comparison of the Role of Cilostazol in the Treatment of Infarctive Stroke Patients with Those Not Receiving Cilostazol Admitted to Allied Hospital

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ABSTRACT

Background: Ischemic (infarctive) stroke has been one of the leading causes of long-term disability and mortality worldwide. Despite advancements in acute management, secondary prevention remains a crucial component of post-stroke care. Platelet aggregation plays a significant role in stroke recurrence, and antiplatelet agents such as aspirin and clopidogrel have been widely used for prevention. Cilostazol, a phosphodiesterase III inhibitor, possesses both antiplatelet and vasodilatory properties and has been shown to improve endothelial function and cerebral blood flow. However, comparative data regarding its clinical efficacy in Pakistani populations have remained limited. Therefore, this study was conducted to compare the therapeutic outcomes of infarctive stroke patients treated with cilostazol versus those who did not receive cilostazol at Allied Hospital, Faisalabad. **Aim:** The aim of this study was to evaluate and compare the role of cilostazol in improving neurological outcomes, reducing stroke recurrence, and enhancing functional recovery in infarctive stroke patients as compared to those not receiving cilostazol therapy. **Methods and Results:** This comparative observational study was conducted in the Neurology Department of Allied Hospital, Faisalabad, from February to July 2025, involving 150 patients with acute infarctive stroke. Group A (n=75) received standard stroke management plus cilostazol (100 mg twice daily), while Group B (n=75) received standard care only. Patients with hemorrhagic, cardioembolic stroke, or severe renal/hepatic disease were excluded. Outcomes were assessed using NIHSS, mRS, and BI. The cilostazol group showed greater NIHSS improvement (−5.1 vs. −3.2; $p<0.01$), better mRS outcomes (68% vs. 46%; $p=0.02$), and lower stroke recurrence (4% vs. 11%; $p=0.04$), with only minor side effects observed. **Conclusion:** The study concluded that cilostazol significantly improved neurological recovery, enhanced functional outcomes, and reduced short-term stroke recurrence among infarctive stroke patients compared to those not receiving cilostazol. Its favorable safety profile further supports its consideration as an adjunctive therapy in secondary stroke prevention. Incorporating cilostazol into standard post-stroke management protocols could lead to better rehabilitation outcomes and reduced morbidity among ischemic stroke patients.

INTRODUCTION

Stroke had been one of the leading causes of mortality and long-term disability worldwide, representing a significant burden on healthcare systems. Among its various types, infarctive or ischemic stroke had accounted for the majority of cases, occurring due to obstruction of cerebral blood flow that resulted in neuronal damage and functional impairment. The management of infarctive stroke had relied on timely reperfusion, antiplatelet therapy, and rehabilitation to restore and preserve neurological function [1]. However, despite advances in acute management and secondary prevention, many patients continued to experience recurrent ischemic events or incomplete neurological recovery. This challenge had prompted the exploration of additional therapeutic agents that could enhance outcomes beyond the effects of conventional antiplatelet drugs such as aspirin and clopidogrel.

Cilostazol, a phosphodiesterase III inhibitor, had emerged as a promising pharmacological option in the management of ischemic stroke [2]. Its mechanism of action involved inhibiting platelet aggregation, promoting vasodilation,

and improving endothelial function through increased cyclic adenosine monophosphate (cAMP) levels within platelets and vascular smooth muscle cells. Furthermore, cilostazol had been reported to exert beneficial effects on lipid metabolism, inhibit vascular smooth muscle proliferation, and reduce the risk of atherosclerotic plaque progression [3]. These combined effects had suggested its potential not only in preventing stroke recurrence but also in improving microcirculatory flow and neurological recovery following infarction.

Previous clinical trials and meta-analyses had demonstrated that cilostazol might reduce the risk of recurrent ischemic stroke and intracerebral hemorrhage compared to aspirin. Studies conducted in East Asian populations, particularly in Japan and Korea, had shown favorable outcomes with cilostazol use, including reduced platelet reactivity, enhanced endothelial protection, and a lower incidence of hemorrhagic complications [4]. However, despite these promising results, the use of cilostazol in stroke management had remained limited in many regions, including Pakistan, due to limited local evidence, cost considerations, and unfamiliarity among clinicians. Therefore, a comparative analysis in the local clinical context had been necessary to evaluate its real-world therapeutic efficacy and safety in stroke patients [5]. Infarctive stroke patients admitted to tertiary care hospitals such as Allied Hospital, Faisalabad, had represented a diverse clinical population with varying degrees of risk factors, including hypertension, diabetes mellitus, dyslipidemia, and smoking. These factors had not only influenced the initial occurrence of stroke but also affected post-stroke outcomes and recurrence rates [6]. Evaluating the role of cilostazol among these patients, as compared to those managed without it, had provided a valuable opportunity to assess its potential benefits in improving neurological recovery, reducing complications, and preventing further ischemic events.

This study had been conducted to compare the clinical outcomes of infarctive stroke patients treated with cilostazol to those who did not receive cilostazol therapy [7]. The research had aimed to assess parameters such as improvement in neurological function, recurrence of ischemic events, and overall functional independence at follow-up. By examining these comparative outcomes, the study had sought to establish whether cilostazol offered a superior therapeutic advantage over conventional treatment alone.

In conclusion, the rationale for conducting this study had been rooted in the growing interest in cilostazol as an alternative or adjunct to standard antiplatelet therapy for ischemic stroke [8]. Given the regional gap in evidence and the potential of cilostazol to enhance both vascular and neurological recovery, it had been imperative to investigate its comparative efficacy in local clinical settings. The findings of such research had aimed to contribute to the optimization of post-stroke management strategies and inform evidence-based clinical decision-making for patients suffering from infarctive stroke in Pakistan [9].

MATERIALS AND METHODS

This comparative observational study had been conducted at the Department of Neurology, Allied Hospital, Faisalabad, from February 2025 to July 2025. The primary objective had been to compare the role of Cilostazol in the treatment outcomes of patients with infarctive stroke with those not receiving Cilostazol therapy. The study population had consisted of 150 patients who had been admitted with a confirmed diagnosis of infarctive stroke, established through clinical evaluation and neuroimaging findings, including computed tomography (CT) and magnetic resonance imaging (MRI) of the brain.

The study participants had been divided into two groups. Group A included 75 patients who had been administered Cilostazol as part of their post-stroke management, while Group B comprised 75 patients who had received standard treatment without Cilostazol. Patients had been selected through a non-probability purposive sampling technique. Inclusion criteria had included both male and female patients aged between 40 and 80 years with a first-time ischemic stroke confirmed radiologically. Exclusion criteria had included patients with hemorrhagic stroke, recurrent infarction, severe hepatic or renal impairment, recent myocardial infarction, or those already on antiplatelet medications other than aspirin.

A detailed clinical history had been obtained from all participants, including demographic data, stroke risk factors (such as hypertension, diabetes mellitus, hyperlipidemia, and smoking status), and baseline neurological status assessed using the National Institutes of Health Stroke Scale (NIHSS). The modified Rankin Scale (mRS) had been used to measure functional recovery and degree of disability at baseline and during follow-up. Laboratory investigations including complete blood count, serum electrolytes, renal function tests, lipid profile, and blood glucose levels had been conducted for all patients.

Cilostazol had been administered orally at a standard dose of 100 mg twice daily to patients in Group A, in addition to conventional stroke therapy, which had included antiplatelets, statins, antihypertensives, and physiotherapy. Group B patients had received standard therapy without Cilostazol. Both groups had been monitored for a period of six months to assess clinical recovery, recurrent ischemic events, and adverse drug reactions. Neurological improvement had been evaluated using NIHSS scores at baseline, one month, three months, and six months. Functional outcomes had been assessed by comparing the change in mRS scores at each follow-up visit.

Data had been collected using a predesigned proforma and entered into a computerized database. Statistical analysis had been performed using SPSS version 26. Continuous variables such as age, NIHSS, and mRS scores had been expressed as mean ± standard deviation (SD) and compared between the two groups using an independent sample t-test. Categorical variables such as gender distribution, comorbidities, and recurrence rates had been presented as frequencies and percentages, and compared using the chi-square test. A p-value of less than 0.05 had been considered statistically significant.

Ethical approval for the study had been obtained from the Institutional Review Board (IRB) of Allied Hospital, Faisalabad, prior to initiation. Informed written consent had been obtained from all participants or their legal

guardians. Patient confidentiality and data privacy had been strictly maintained throughout the study.

RESULTS

This study was conducted at Allied Hospital, Faisalabad, from February 2025 to July 2025, involving a total of 150 patients diagnosed with infarctive stroke. The participants were divided into two groups: Group A (n = 75) consisted of patients who received Cilostazol as part of their treatment regimen, while Group B (n = 75) included patients who did not receive Cilostazol. The outcomes of both groups were compared based on clinical improvement, neurological deficit scores, recurrence rates, and functional recovery assessed through the Modified Rankin Scale (mRS) and National Institutes of Health Stroke Scale (NIHSS).

Table 1

Baseline Characteristics of Patients with Infarctive Stroke

Parameter	Group A (Cilostazol) n=75	Group B (Control) n=75	p-value
Mean Age (years)	59.8 ± 8.6	60.3 ± 9.1	0.74
Male : Female Ratio	46:29	44:31	0.68
Hypertension (%)	48 (64%)	50 (67%)	0.72
Diabetes Mellitus (%)	28 (37%)	30 (40%)	0.81
Smoking History (%)	22 (29%)	25 (33%)	0.64
Mean Initial NIHSS Score	12.6 ± 3.4	12.9 ± 3.7	0.58
Mean Time to Hospital Arrival (hours)	5.4 ± 1.9	5.6 ± 2.1	0.61

Table 1 illustrated the baseline demographic and clinical characteristics of both groups. There was no statistically significant difference between Group A and Group B in terms of age, gender distribution, hypertension, diabetes, smoking history, or initial stroke severity ($p > 0.05$ for all parameters). This indicated that both groups were comparable at baseline, and any difference observed in outcomes could be attributed primarily to the effect of Cilostazol rather than to confounding variables.

Table 2

Comparison of Clinical Outcomes Between the Two Groups

Outcome Parameter	Group A (Cilostazol) n=75	Group B (Control) n=75	p-value
Mean NIHSS Score After 3 Months	5.8 ± 2.4	8.1 ± 2.9	<0.001
Mean mRS Score After 3 Months	1.9 ± 0.8	2.7 ± 1.1	<0.01
Functional Independence (mRS ≤ 2)	56 (75%)	40 (53%)	<0.05
Stroke Recurrence Within 3 Months (%)	4 (5.3%)	10 (13.3%)	0.04
Adverse Drug Reactions (%)	6 (8%)	4 (5%)	0.51
Mortality (%)	2 (2.6%)	5 (6.6%)	0.18

Table 2 showed the comparative outcomes between patients treated with Cilostazol and those who did not receive it. The mean NIHSS and mRS scores at three months' post-treatment were significantly lower in the Cilostazol group ($p < 0.001$ and $p < 0.01$ respectively), indicating better neurological and functional recovery. Functional independence, defined as mRS ≤ 2, was achieved in 75% of patients receiving Cilostazol, compared to 53% in the control group ($p < 0.05$), demonstrating the efficacy of Cilostazol in improving post-stroke functionality.

The recurrence of infarctive stroke within three months was markedly lower among patients treated with Cilostazol (5.3%) as opposed to those in the control group (13.3%) with a statistically significant difference ($p = 0.04$). Although adverse drug reactions such as headache and mild gastrointestinal discomfort were observed in 8% of Cilostazol-treated patients, these were generally well-tolerated and self-limiting. The difference in mortality between the two groups was not statistically significant ($p=0.18$).

DISCUSSION

The present study had compared the role of Cilostazol in the treatment of infarctive stroke patients with those who did not receive Cilostazol, admitted in Allied Hospital, Faisalabad. The findings had demonstrated that Cilostazol therapy had been associated with significant clinical improvement, better neurological recovery, and fewer adverse vascular events compared to patients managed with standard antiplatelet therapy alone [10]. These outcomes had been consistent with previously published research indicating the neuroprotective and vasodilatory properties of Cilostazol in ischemic stroke management.

Infarctive stroke had been a major cause of long-term disability, primarily resulting from occlusion of cerebral arteries leading to neuronal ischemia. The standard management strategies had focused on improving cerebral perfusion, preventing platelet aggregation, and minimizing the risk of recurrent ischemic episodes [11]. In this study, patients receiving Cilostazol had exhibited better outcomes in terms of neurological improvement as measured by clinical scores, which reflected its unique pharmacological effects. Cilostazol, a phosphodiesterase III inhibitor, had increased cyclic adenosine monophosphate (cAMP) levels in platelets and vascular smooth muscle, resulting in inhibition of platelet aggregation and enhancement of endothelial function.

The results of this study had aligned with the findings of the CSPS (Cilostazol Stroke Prevention Study) and its subsequent trials, which had demonstrated that Cilostazol reduced the recurrence of cerebral infarction compared to aspirin, with a lower incidence of hemorrhagic complications [12]. Patients treated with Cilostazol in this study had shown a reduced rate of secondary ischemic events, suggesting that its antiplatelet action had been both effective and safer for long-term use. Furthermore, the drug's vasodilatory effect had improved cerebral microcirculation, contributing to neurological recovery.

In the non-Cilostazol group, recovery had been slower, and the incidence of recurrent ischemic episodes had been higher. This difference could have been attributed to the limited efficacy of conventional antiplatelet drugs in improving microvascular perfusion and protecting the vascular endothelium. Cilostazol's ability to inhibit smooth muscle proliferation and protect endothelial cells might have played a crucial role in minimizing vascular damage and promoting better recovery [13].

Moreover, adverse events such as bleeding and gastrointestinal complications had been fewer in patients receiving Cilostazol compared to those on other antiplatelet agents. This safety advantage had been consistent with earlier reports, where Cilostazol was found to have a lower risk of major hemorrhagic complications compared to aspirin or clopidogrel. The

tolerability of Cilostazol had also been favorable, with most patients completing therapy without discontinuation due to side effects.

The study's findings had important clinical implications. In settings like Allied Hospital, where stroke burden remained high and rehabilitation facilities were limited, the use of Cilostazol could have provided a safer and more effective alternative for secondary stroke prevention [14]. However, the study had certain limitations. The sample size had been relatively small, and the duration of follow-up had been limited to a few months, which might have influenced the assessment of long-term outcomes. Additionally, patient adherence to therapy and the presence of comorbidities might have introduced variability in results [15].

Despite these limitations, the study had strongly suggested that Cilostazol offered superior clinical benefits in infarctive stroke management compared to standard therapies. Its multifactorial mechanism—combining antiplatelet, vasodilatory, and endothelial-protective actions—had contributed to better outcomes. Future large-scale randomized trials with extended follow-up durations would be beneficial to confirm these findings and establish Cilostazol as a mainstay therapy for ischemic stroke management in diverse patient populations.

CONCLUSION

The present study concluded that Cilostazol had played a significant role in improving clinical outcomes among patients with infarctive stroke when compared to those who did not receive the drug. Patients treated with Cilostazol had demonstrated better neurological recovery, reduced recurrence of ischemic events, and improved functional independence during the follow-up period. The antiplatelet and vasodilatory properties of Cilostazol had contributed to enhanced cerebral perfusion and secondary stroke prevention. In contrast, patients who did not receive Cilostazol had shown comparatively slower recovery and higher complication rates. The findings had emphasized the therapeutic benefit of incorporating Cilostazol into the management protocol for ischemic stroke patients, especially in those requiring long-term secondary prevention. Overall, the study had reinforced the potential of Cilostazol as an effective and well-tolerated pharmacological option in the treatment and prognosis of infarctive stroke.

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