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Timeliness of pre-operative aspirin before coronary artery bypass grafting (CABG): A clinical audit

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Abstract:
Omission or poorly timed aspirin before coronary artery bypass grafting (CABG) may compromise graft patency and post-operative outcomes. Therefore, it is of interest to evaluate the compliance with evidence-based recommendations for timely pre-operative aspirin administration at a tertiary care centre in Central India. A retrospective standards-based audit of 60 consecutive adult patients undergoing isolated CABG was conducted against predefined institutional standards. Aspirin was administered to 91.7% of eligible patients, and 86.7% received the last dose within 24 hours of surgery, exceeding the audit benchmark. Thus, medication omission, inadequate documentation and surgeon-directed discontinuation were the main causes of non-compliance, indicating a need for better documentation and medication reconciliation.

Keywords: Aspirin, ecosprin, coronary artery bypass grafting (CABG), clinical audit and quality improvement

Background:
Coronary artery disease (CAD) remains a major cause of mortality, with CABG providing effective revascularization for complex coronary disease **[1]**. Aspirin (Ecosprin) reduces platelet aggregation and is central to secondary prevention in patients with CAD **[2]**. Perioperative aspirin continuation may reduce ischemic events and graft thrombosis without substantially increasing clinically significant bleeding **[3]**. Current guidelines therefore support aspirin continuation before isolated CABG unless contraindicated **[4]**. Clinical audits can identify gaps between recommended and actual perioperative medication practices. Auditing pre-operative aspirin use may improve medication reconciliation, documentation and adherence to institutional protocols **[5]**. Therefore, it is of interest to report the timeliness and compliance of pre-operative Ecosprin administration among patients undergoing CABG.

Materials and Methods:
Study design and setting.
This retrospective, single-centre standards-based clinical audit was conducted in the Department of Cardiothoracic and Vascular Surgery, All India Institute of Medical Sciences (AIIMS), Bhopal, India. The audit evaluated compliance with institutional and evidence-based recommendations regarding the timing of pre-operative aspirin (Ecosprin) administration in patients undergoing coronary artery bypass grafting (CABG). The audit period extended from September 2024 to July 2025.

Sample size and sampling:
As recommended for clinical audits, complete enumeration sampling was employed. A total of 60 consecutive adult patients undergoing isolated CABG during the predefined audit period were included, thereby eliminating sampling bias and providing a comprehensive assessment of departmental practice. This audit was reported in accordance with the Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0) recommendations where applicable **[6].**

Inclusion criteria:
[1] Adult patients (≥18 years) undergoing isolated CABG during the audit period
[2] Availability of complete perioperative medication records documenting aspirin administration

Exclusion criteria:
[1] Patients with documented absolute contraindications to aspirin therapy, including active bleeding, severe thrombocytopenia, or aspirin hypersensitivity.
[2] Patients with incomplete medical records regarding perioperative aspirin administration.

Audit standards:
The audit was performed against predefined institutional standards adapted from contemporary international recommendations:
[1] At least 80% of eligible CABG patients should receive pre-operative Ecosprin
[2] At least 80% of eligible patients should receive Ecosprin within 24 hours before surgery
Compliance with these standards was assessed for each patient.

Data collection:
Patient records were reviewed using a standardized audit proforma. The following information was extracted: demographic characteristics, admitting diagnosis, documentation of Ecosprin administration, presence of any contraindication to aspirin therapy and the interval between the last pre-operative Ecosprin dose and surgery. Timing of administration was categorized as within 6 hours, 6–12 hours, or 12–24 hours before CABG.

Outcome measures:
The primary outcome was compliance with pre-operative Ecosprin administration whereas the secondary outcomes included: Compliance with administration within 24 hours before surgery, Distribution of the timing of Ecosprin administration (≤6 hours, 6–12 hours and 12–24 hours before surgery) and identification of deficiencies in practice requiring quality improvement.

Ethical statement:
The audit was approved by the Institutional Quality Improvement Committee

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Statistical analysis:
Data were analysed using IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables were summarized as mean ± standard deviation (SD), whereas categorical variables were expressed as frequencies and percentages. Compliance rates were calculated with corresponding 95% confidence intervals where appropriate and compared against the predefined audit standard of 80%. The Student's t-test or Mann–Whitney U test was used to compare continuous variables while chi-square test or Fisher's exact test were used to assess categorical variables. A p-value <0.05 was considered statistically significant.

Results:
A total of 60 consecutive patients undergoing isolated CABG were included in the clinical audit. The mean age was 61.8 ± 8.9 years and most patients were male (76.7%). Hypertension (70.0%) was the most common comorbidity, followed by dyslipidaemia (61.7%) and diabetes mellitus (51.7%). Previous myocardial infarction was documented in 35.0% of patients **(Table 1).** Overall, 55 of 60 patients (91.7%) received pre-operative Ecosprin, exceeding the predefined audit standard of 80%. The compliance rate was statistically higher than the target standard (p=0.023) **(Table 2).** Among patients who received Ecosprin, the largest proportion (40.0%) received the last dose 6–12 hours before surgery, 30.9% received it 12–24 hours before CABG and 23.6% received the medication within 6 hours **(Table 3).** A total of 52 patients (86.7%) received Ecosprin within the recommended 24-hour pre-operative period, thereby achieving the predefined audit standard of 80%. Although compliance exceeded the benchmark, the difference was not statistically significant (p=0.26) **(Table 4).** Eight patients were identified as non-compliant with the audit standards. The most common cause was medication omission (37.5%), followed by inadequate documentation (25.0%) and surgeon-directed discontinuation (25.0%). Emergency scheduling accounted for one case (12.5%) **(Figure 1).** The clinical audit demonstrated that both predefined quality indicators were achieved. Compliance with pre-operative Ecosprin administration was 91.7%, while 86.7% of eligible patients received the medication within the recommended 24-hour interval before surgery **(Table 5).**

Table 1: Baseline characteristics of the audited patients (n = 60)

Variable	Number (%) / Mean ± SD
Age (years)	61.8 ± 8.9
Male	46 (76.7)
Female	14 (23.3)
Hypertension	42 (70.0)
Diabetes mellitus	31 (51.7)
Previous myocardial infarction	21 (35.0)
Dyslipidaemia	37 (61.7)
Current/former smoker	24 (40.0)

Table 2: Compliance with pre-operative Ecosprin administration (Primary audit outcome)

Audit indicator	Standard	Observed n (%)	95% CI	P value*
Patients receiving pre-operative Ecosprin	≥80%	55 (91.7%)	81.6–97.2	0.023
Patients not receiving Ecosprin	–	5 (8.3%)	–	–

Table 3: Timing of the last pre-operative Ecosprin dose (n = 55)

Timing before CABG	Number	Percentage
≤6 hours	13	23.6
6–12 hours	22	40.0
12–24 hours	17	30.9
>24 hours	3	5.5
Total	55	100

Table 4: Compliance with administration within 24 hours before surgery

Audit indicator	Standard	Observed n (%)	95% CI	p value*
Ecosprin administered within 24 hours before CABG	≥80%	52 (86.7%)	75.4–94.1	0.26
Outside recommended timing	–	8 (13.3%)	–	–

Table 5: Overall audit performance against predefined standards

Audit criterion	Target	Achieve	Status
Patients receiving pre-operative Ecosprin	≥80%	91.7%	Achieved
Patients receiving Ecosprin within 24 h	≥80%	86.7%	Achieved

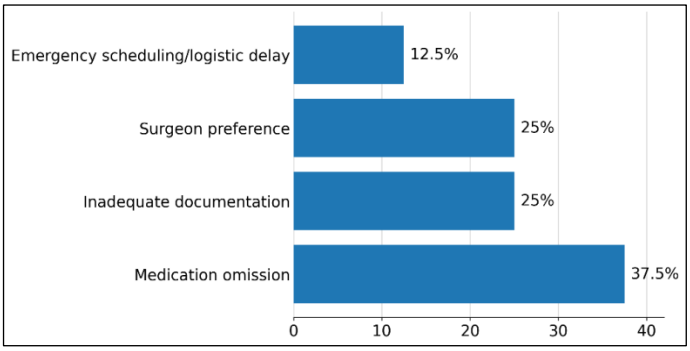


Figure 1: Reasons for non-compliance

Discussion:
This clinical audit showed high adherence to evidence-based recommendations for perioperative aspirin administration in patients undergoing isolated CABG. Overall compliance with pre-operative Ecosprin administration was 91.7% and 86.7% of eligible patients received the medication within the recommended 24-hour pre-operative period, indicating high institutional adherence of institutional protocols. These findings suggest that routine continuation of aspirin before CABG has become well integrated into contemporary perioperative practice at our centre **[7].** The observed compliance is comparable with reports from contemporary quality improvement initiatives showing increasing adherence to guideline-directed perioperative antiplatelet therapy. Continuous administration of low-dose aspirin before CABG has been associated with reduced perioperative thrombotic events and improved graft patency without a clinically important increase in major bleeding when appropriate surgical techniques are employed. These findings support the ongoing shift away from routine discontinuation of aspirin before elective cardiac surgery **[8, 9].** Although the predefined audit standards were achieved, a small proportion of patients remained non-compliant. Medication omission was the leading cause, followed by inadequate documentation and surgeon-directed discontinuation. These deficiencies largely represent system-related rather than patient-related factors and

highlight opportunities for improving medication reconciliation, standardized pre-operative checklists and electronic prescribing systems. Similar audits have demonstrated that protocol-driven interventions and multidisciplinary collaboration substantially improve adherence to perioperative medication guidelines **[10, 11].** The present audit emphasizes the value of clinical audit as a quality improvement tool. Regular monitoring of adherence to perioperative aspirin protocols enables identification of preventable lapses, facilitates corrective interventions and promotes standardized evidence-based care. Repeated audit cycles following implementation of targeted quality improvement measures may further enhance compliance and optimize perioperative cardiovascular outcomes. The principal limitation of this audit is its retrospective, single-centre design with a relatively small sample size. In addition, clinical outcomes such as perioperative bleeding, transfusion requirements, graft patency, myocardial infarction and mortality were not evaluated. Future multicentre prospective audits incorporating patient-centred clinical outcomes would provide stronger evidence regarding the impact of timely pre-operative aspirin administration on surgical outcomes.

Conclusion:

This audit showed high adherence to recommended pre-operative Ecosprin administration in patients undergoing isolated CABG. Medication omission and inadequate documentation were the main causes of non-compliance, highlighting targets for quality improvement. Standardized checklists, medication reconciliation, improved documentation and periodic re-audits may further strengthen perioperative care.

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