

Clopidogrel and Surgical Delay in Patients with Hip Fractures: A District General Hospital Audit

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Citation

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Abstract

Objectives. To review of outcome following delay in surgery in patients with hip fracture taking clopidogrel (Plavix bisulphate) on admission. **Methods.** Retrospectively studied patients with hip fractures on clopidogrel admitted to our trauma unit between January 1, 2006 and May 31, 2007. **Results.** We report the results of a retrospective study of 15 patients taking clopidogrel on admission. The mean preoperative haemoglobin levels were 12.4 (range 9.9 to 14.1), the mean postoperative haemoglobin level were 9.7 (range 8 to 12.3). Four patients required blood transfusions. The mean delay in surgery was 9.1 days (range 7 to 14 days). The mean duration of hospital stay was 21 days (range, 8 to 45 days). Three patients died secondary to cerebrovascular complications. **Conclusion.** In summary, we found that there is increase mortality and requirement for blood transfusion in patients on clopidogrel in whom surgery were delayed.

INTRODUCTION

Clopidogrel is an anti-platelet medication that inhibits adenosine diphosphate-induced platelet aggregation. Clopidogrel acts by irreversibly modifying the platelet adenosine diphosphate receptor. Consequently platelet exposed to clopidogrel are effected for the remainder of their life span¹. It takes upto 2 hour for an oral dose before its effective, and half-life of the circulating active metabolite is 8 hours, but the anti-platelet effect last until new platelet are formed.

The National Institute for Clinical Excellence advocates the use of clopidogrel in the events like recent stroke, peripheral vascular disease, non-ST segment elevation acute coronary syndrome, patients intolerant to aspirin and myocardial infarction³. Clopidogrel has potential to cause bleeding complications in patients undergoing surgery. There has been literature in cardiothoracic, plastic, ophthalmology and vascular surgery assessing the risk of bleeding in patients on clopidogrel, but are often contradictory. To our knowledge there is no published data outlining the frequency of bleeding complications in hip fracture patients^{4,5,6}. Approximately 60,000 patients are admitted each year in the United Kingdom with a hip fractures and this number is expected to rise to around 70,000 by 2020⁷. Majority of patients with hip fractures are elderly with multiple medical co-morbidities. They are often on numbers of regular

medications which may include aspirin, warfarin and recently clopidogrel. The use of clopidogrel as an antiplatelet agent has increased in use over the past several years. with the increasing age of trauma patients in conjunction with their co morbidities requiring such medication, it is reasonable to assume that the pre-injury use of clopidogrel will increase. However, there is a paucity of literature examining the effects of pre-injury clopidogrel use in hip fracture patients.

The aim of this study was to investigate whether stopping clopidogrel on admission and subsequently delaying surgery increases the risk of cerebrovascular complications and in-hospital mortality.

MATERIAL AND METHODS

After obtaining approval from the Gloucester Royal Hospital audit department, we

retrospectively studied patients with hip fractures on clopidogrel admitted to our trauma unit between January 1, 2006 and May 31, 2007.

Data were entered into a Microsoft Excel spreadsheet programme and analysed. Patients were excluded from the study if were on combination of anithrombotic medications like aspirin or

warfarin. Fifteen patients with hip fractures on clotidogrel were included in our study. Demographic (table 1) details of patients were recorded including the primary diagnosis on admission, type and timing of surgical intervention performed, use of alternative venothromboembolic prophylaxis while awaiting surgery, pre-and post-operative Haemoglobin and classification according to the American Society of Anesthesiologists (ASA).

To measure the effect of delay before surgery, we investigated post-operative complications like: pulmonary infections, urinary tract infections, wound infections, cerebrovascular complications, bleeding intra and post-operatively, blood transfusion and in-hospital mortality. Causes of mortality as recorded in the death certificate were also acquired.

RESULTS

In total 15 patients met the inclusion criteria, there were 2 men and 13 women aged 66 to 94 (mean, 81.3, mode, 79, median, 89). 8 fracture were intracapsular and 7 extracapsular. The mean preoperative haemoglobin levels were 12.4 (range 9.9 to 14.1), the mean postoperative haemoglobin level were 9.7 (range 8 to 12.3). Four patients required blood transfusions, 8 unit of blood were transfused in total postoperatively. Indication for clotidogrel (table 2). The mean delay in surgery were 9.1 days (range 7 to 14 days), the mean preoperative ASA score were 2.6 (range, 2-3). The mean duration of hospital stay was 21 days (range, 8 to 45 days)

We noticed a significant difference in extracapsular hip fracture with regards to post-operative drop in haemoglobin and transfusion requirement (table 1). There were 3 mortalities one patient died due to pulmonary embolism in recovery (table 3). The autopsy result showed massive thrombus in one of the pulmonary vessels. Second patient developed cerebral infarct, CT scan showed large infarct on right temporoparietal region

and third patient had myocardial infarction and died in coronary care unit.

DISCUSSION

Patients undergoing orthopaedic surgery have a high incidence of thrombo-embolic Complications. Without thromboprophylaxis, the rates of total and proximal deep vein thrombosis are approximately 50% and 25% respectively ¹²¹³, with fatal pulmonary embolism rates of 4% to 13%. Elderly patients usually have medical conditions and reduced physiological reserve, Which may lead to peri and postoperative complications ¹⁴.delaying surgery in this group can lead to high mortality and morbidity; survival is better in those having their operation on the day of admission, particularly for person aged >80 years ¹⁵. The recent National institute of clinical excellence guide lines recommendations for the usage of clotidogrel mean, we will be encountering increase number of elderly patients on clotidogrel. Evidence from cardiothoracic literature has demonstrated that performing surgery on patients taking clotidogrel leads to increase risk of bleeding and blood transfusion ¹⁶. To our knowledge there is no published evidence in the trauma/emergency situation on peri-postoperative withdrawal (or not) of clotidogrel, timing of surgery and concomitant thrombo- prophylaxis.

We found that the delay in surgery lead to increase number of death in our patients. We also noticed that the cause of death were secondary to thromboembolic event. Due to lack of clotidogrel protocol, clotidogrel were stopped on admission and no alternative form of venothromboembolic prophylaxis initiated. The other fact is nutritional status that may have been adversely effected due to fasting. Many patients were fasted on multiple days with the prospect of surgery, only to be cancelled the following morning. This repeat fasting may also have contributed to their poor outcome. We also found that post-operative decrease in haemoglobin was greater in extracapsular hip fracture. The other problem with these patients is type of anesthesia. There has been evidence In literature regarding complication of using spinal/epidural anaesthesia ¹⁷. In our department most anaesthetics will wait for 7 days before the last dose of clotidogrel due to the risk of spinal haematoma. In 2005 National anaesthetic guidelines published recommendation with regards to emergency surgery in patients taking clotidogrel. They suggested if possible delay surgery for at least 24 h from the last dose of clotidogrel when platelet transfusion can be given if excessive bleeding occurs ¹⁸. There is therefore a balance that needs to be addressed

between the potential risks of peri-operative bleeding and the risks associated with delaying surgery. Therefore the timing of surgery requires liaison with the anesthetic colleagues as to whether general anaesthesia can be used in place of spinal on the basis of patient medical fitness.

CONCLUSION

In summary, we found that there is increase mortality and requirement for blood transfusion in patients on clopidogrel in whom surgery were delayed. A well designed research is needed to compare the outcome following early versus delay surgery to achieve evidence based management, but this may require several years due to the small, but increasing, number patients seen at present. Our department has changed its current practice following this useful audit. We suggest early surgery for elderly hip fracture patients on clopidogrel, as the mortality and morbidity associated in these patients are high. All patients should be cross matched pre-operatively for red blood cells and platelets and operating surgeon should be experienced to expedite the procedure.

Figure 1

Table 1: Demographics

| | Extracapsular | Intracapsular |
|-------------|---------------|---------------|
| N | 8 | 7 |
| Age | 79.6 | 82 |
| Pre-op HB | 12.7 | 12.1 |
| Post-op HB | 11.6 | 9.3 |
| Transfusion | 1 | 3 |

Figure 2

Table 2: Number of patients and indication

| Indication for clopidogrel | N |
|----------------------------|---|
| Myocardial Infarction | 6 |
| Stroke | 3 |
| Intolerance to aspirin | 1 |
| Atrial Fibrillation | 2 |
| Transient Ischemic Attack | 3 |

Figure 3

Table 3: Duration of hospital stay prior to mortality

| Number of days | Number of patients | Cause of death in death certificate |
|----------------------------|--------------------|-------------------------------------|
| Between 24 hour and 7 days | 1 | Pulmonary embolism |
| Between 8 and 30 days | 2 | Myocardial infarction |
| | | Stroke |

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