**CASE REPORT**

Thrombotic thrombocytopenic purpura/haemolytic uraemic syndrome associated with clopidogrel: report of two new cases

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Clopidogrel has been reported to be safe and effective in reducing vascular events. Nevertheless, there is growing evidence that clopidogrel may cause thrombotic thrombocytopenic purpura/haemolytic uraemic syndrome (TTP/HUS). This association has been debated, since in several cases alternative causes could not be excluded. Two new cases of TTP/HUS associated with clopidogrel are reported here. After discontinuation of clopidogrel and treatment with plasma exchange, both patients had a complete and sustained recovery from TTP/HUS. These cases corroborate previous observations that clopidogrel may indeed be a rare cause of TTP/HUS.

**CASE REPORTS**

**Case 1**

A 76 year old man was admitted to hospital because of a pathological blood count and increasing somnolence. Laboratory testing showed the following abnormalities: haemoglobin (7.3 g/dl), platelet count (4 × 10^11/l), lactate dehydrogenase (1120 IU/l), total bilirubin (27.6 µmol/l), haptoglobin (< 0.9 µmol/l), and a slight red cell schistocytosis in the peripheral blood smear. The direct antiglobulin test was negative. On the third day after hospital admission, the patient had a posterior myocardial infarction. Under treatment with plasmapheresis and glucocorticoids, the platelet count gradually increased and returned to normal on day 10. All drugs were stopped and the patient was treated with daily plasmapheresis with an average exchange of 2520 ml (12 units) fresh frozen plasma for five days. Additionally, two new cases of clopidogrel associated TTP/HUS have been reported in an active surveillance study, but it has been debated whether these cases present enough evidence for causality. Here we report two new cases of clopidogrel associated TTP/HUS.

**Case 2**

A 43 year old man was admitted to the hospital emergency room for acute angina pectoris. A myocardial infarction was excluded but routine laboratory testing showed the following abnormal values: platelet count (23 × 10^11/l), white blood cell count (14 × 10^9/l), total bilirubin (145.4 µmol/l), and creatinine (168 µmol/l). On the second day after hospital admission, the patient’s platelet count further decreased to 13 × 10^9/l, total bilirubin increased to 197.0 µmol/l, and creatinine increased to 203 µmol/l. Lactate dehydrogenase was 2970 IU/l, haemoglobin 13.9 g/dl, and free haemoglobin 75 mg/dl (normal range < 10 mg/dl). His peripheral blood smear showed red blood cell fragmentation. The direct antiglobulin test was negative. On the third day after hospital admission, his haemoglobin further decreased to 7.8 g/dl. Three weeks before hospital admission, the patient had been started on a regimen with clopidogrel (75 mg/day), dalteparin, metoprolol, acetylsalicylic acid, molsidomine, and glyceryl trinitrate spray for unstable angina pectoris, and was waiting for scheduled cardiac catheterisation with angioplasty (fig 2). In hospital, HUS was diagnosed. All drugs were stopped and the patient was treated with daily plasmapheresis with an average exchange of 2520 ml (12 units) fresh frozen plasma for five days. Additionally, methylprednisolone was administered in tapering doses. Four days after hospital admission, the patient had a posterior myocardial infarction. Under treatment with plasmapheresis and glucocorticoids, the platelet count gradually increased and returned to normal on day 10. All drugs were reintroduced except clopidogrel and dalteparin. The patient has had no relapse of TTP/HUS and six months after discharge his blood count was still normal.

**DISCUSSION**

The causality between clopidogrel intake and TTP has been debated recently. In some case reports other drugs could not

**Abbreviations:** CAPRIE, clopidogrel versus aspirin in patients at risk of ischaemic events; HUS, haemolytic uraemic syndrome; TTP, thrombotic thrombocytopenic purpura
be ruled out as an alternative cause. In others, either TTP/HUS recurred without repeated intake of clopidogrel or an underlying disease causing TTP/HUS could not be excluded. In a single case, it may be difficult or even impossible to establish a definitive relation between drug intake and occurrence of a disease, since re-exposure is usually not feasible for ethical reasons. Causality assessment would therefore be based on other criteria such as a plausible time course between the initiation of clopidogrel treatment and the occurrence of TTP/HUS; complete and sustained recovery from TTP/HUS after discontinuation of clopidogrel; reintroduction of other drugs without reoccurrence of TTP/HUS; and exclusion of other causes of TTP/HUS. The treatment duration with clopidogrel was nine days in case 1 and three weeks in case 2 before diagnosis of TTP/HUS. In the published case series by Bennett and colleagues, most cases of TTP related to clopidogrel occurred during the first two weeks of treatment and one case after 11 months of clopidogrel. Both our patients had a sustained recovery from TTP/HUS after discontinuation of clopidogrel for at least six and 23 months, respectively. Whereas the first patient had a number of different diseases, the second had no other underlying diseases except coronary heart disease and systemic hypertension. Moreover, the second patient resumed all other drugs except dalteparin and no reoccurrence of TTP/HUS. Since, to our knowledge, neither dalteparin nor any other low molecular weight heparin has ever been reported to cause TTP/HUS, an association with clopidogrel seems probable in this case. In summary, our cases corroborate the observation that clopidogrel may indeed be a cause of drug induced TTP/HUS.

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