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Case Report

Acute thrombocytopenia due to meropenem: a case report

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ABSTRACT

Meropenem is a broad spectrum antibacterial drug from the carbapenem family. It is commonly used as an empirical antimicrobial in severe infections like pneumonia, intra-abdominal infections, septicaemia, meningitis etc. Severe adverse effects with meropenem are rare (<1 %) which include hypersensitivity and hematologic adverse effects. In the literature, few cases have been reported of meropenem induced thrombocytopenia that has shown the immune mechanism by which thrombocytopenia occurs. Drug induced thrombocytopenia (DITP) can be a life threatening condition if not diagnosed and managed properly. As meropenem is being widely used in hospitals nowadays, it is important to be aware of the rare but serious adverse effects it causes.

Keywords: Meropenem, Broad spectrum antibacterial, DITP

INTRODUCTION

Meropenem is a broad spectrum antibacterial drug from the carbapenem family. It is used for severe infections caused by susceptible organisms. It is utilized to treat a wide variety of infections, like pneumonia, intra-abdominal infections, septicaemia, meningitis. Meropenem is also used as empirical therapy prior to identification of organisms and is well tolerated in severe bacterial infections.[1,2] Meropenem has activity against gram-positive, gram-negative and anaerobic bacteria and is primarily used in polymicrobial and nosocomial infections.[2] The most common adverse effects (1-10%) are diarrhoea, nausea and vomiting, rash, headache, constipation, sepsis, thrombophlebitis, etc. Rare adverse effects (<1%) are agranulocytosis, angioedema, hypersensitivity reaction, leukopenia, neutropenia, pancytopenia, etc.[1] We report a case of meropenem induced thrombocytopenia in a 57 year old man.

CASE REPORT

A 57 year old male patient was admitted for pain in the abdomen, hematemesis, malena, fever and loss of appetite. He was a known case of diabetes mellitus since 6 years, hypertension since 15 years, chronic kidney disease on maintenance hemodialysis (not dialysed since 5 months). The patient also had severe anemia due to upper gastrointestinal (GI) bleeding (Hb: 6.1 g/dl), for which one unit of packed red blood cells (RBCs) was given. The RBC count improved to 7.7 g/dl upon transfusion. Patient was also given tablet paracetamol as and when required, ondansetron intravenously and omeprazole by intravenous infusion. Dose of injection actrapid insulin was adjusted according to the blood glucose levels. On day three of admission, injection meropenem intravenously 1 gm stat was given followed by 500 mg twice a day administration empirically. A sharp fall in the platelet count was observed after

administration of the first dose of meropenem. The patient was posted for oesophago-gastro-duodenoscopy (OGD) on the next day for GI bleeding; gastric ulcer was noted and injection adrenaline 1:10000 was injected around ulcer and primary hemostasis was achieved. Repeat OGD was done on the next day and hemoclip was applied.

For the next three days of meropenem administration, follow up of the platelet count showed a decreasing trend. Meropenem was stopped after this observation and the platelet count started increasing after its cessation.

DISCUSSION

Acute thrombocytopenia in a patient is defined as an absolute platelet count <150,000 per µl which is associated with poor health outcomes in severely ill patients. The etiology can be varied in hospitalized patients; large volume transfusion or infusion, sepsis, disseminated intravascular coagulation, decreased bone marrow production due to cancer chemotherapy, platelet sequestration in conditions like hypersplenism, etc. When an etiology for acute thrombocytopenia cannot be discerned, drugs should be considered as a potential cause.

More than 300 drugs are known to cause drug-induced thrombocytopenia (DITP). Some of the antimicrobial agents which are reported to cause thrombocytopenia are vancomycin, linezolid, penicillins, cephalosporins, carbapenems, trimethoprim-sulfomethaxazole. The thrombocytopenia in DITP is usually moderate to severe and bleeding risk depends on the platelet count. Once the causative agent has been identified and stopped, the platelet counts improve usually in 4-8 days, but it can persist for several weeks. The patient should be monitored for any bleeding tendencies and blood counts should be done regularly.[1] An accelerated decrease in platelet count in presence of the potential drug is mostly of immune origin.[1]

In our case report, we have described a patient who developed acute thrombocytopenia on i.v. administration of meropenem after a single dose of 1 gm. A rapid decline in the platelet count was seen from 2,23,000 per cmm to 1,30,000 per cmm and subsequently also reduced to 87000 per cmm following 3 days of meropenem administration (Table 1, Figure 1). No bleeding episodes were observed in the patient.

DITP is often diagnosed empirically. An administered drug which is thought to be the offending agent is stopped and the recovery of platelet count on discontinuation provides evidence that the DITP was due to the drug.[1] The management of DITP is done by cessation of the offending agent and platelet transfusion if required. In our case, meropenem was stopped and alternative antimicrobial was started. No platelet transfusion was required and other medications were continued. The platelet count started improving after meropenem was stopped, and within 5 days the platelet count was in the normal range (1,89,000 per cmm, normal range: 1,50,000–4,50,000 per cmm).

Intravenous immune globulin or plasma exchange may be beneficial in severe and prolonged course of the condition. Corticosteroids are indicated in idiopathic thrombocytopenic purpura and often it is difficult to rule out thrombocytopenic purpura as alternative diagnosis.

Table 1: Platelet count of the patient during hospitalization.

Date	25/07/18	26/07/18^	27/07/18*	29/07/18#	30/7/18 (inj.stop)ᵃ	01/08/2018	05/08/2018
Platelet (/cumm)	3,42,000	2,23,000	1,30,000	98000	87000	1,10,000	1,89,000

Inj. meropenem started, 1gm stat followed by 500 mg b.d.; *OGD was done and injection adrenaline (1:10000) around the ulcer was administered; #OGD and hemoclip application; ᵃ: Inj. meropenem was stopped.
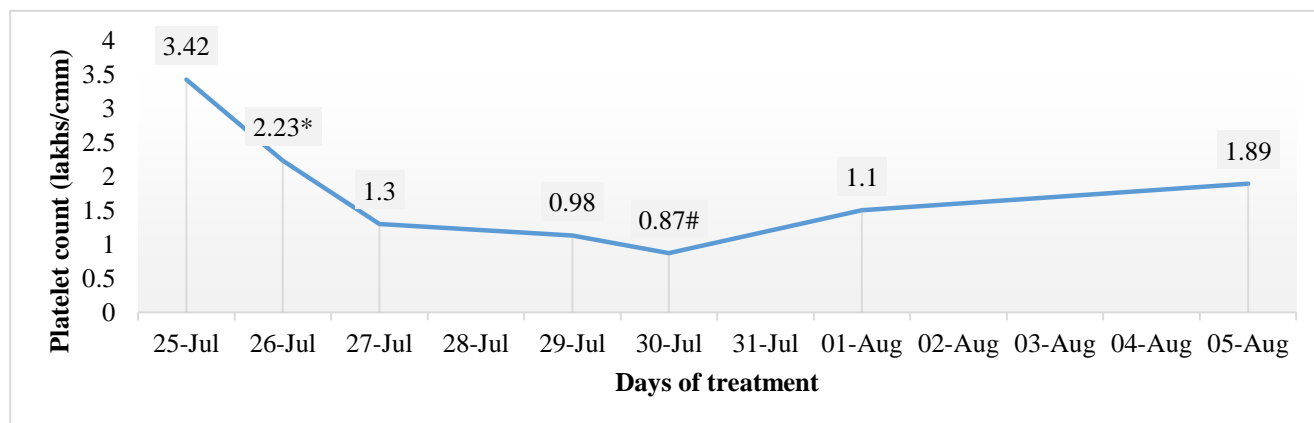
Figure 1: Trend of platelet count of the patient during course of treatment.
*: Meropenem treatment started; #: Meropenem treatment stopped.

CONCLUSION

Meropenem is widely used for the empirical treatment of serious bacterial infections in hospitalized patients. Acute meropenem induced thrombocytopenia should be diagnosed promptly and the patient should be monitored for the same as done in this case report. Dechallenge with this drug proved the causality of thrombocytopenia being injection meropenem. Clinicians should be aware of DITP as a potential adverse effect with meropenem.

REFERENCES

1. Erden M, Gulcan E, Bilen A, Bilen Y, Uyanık A, Keleş M. Pancytopenıa and sepsıs due to meropenem: a case report. Trop J Pharm Res. 2013;12(1):127-9.
2. Baldwin CM, Lyseng-Williamson KA, Keam SJ. Meropenem: a review of its use in the treatment of serious bacterial infections. Drugs. 2008;68(6):803-38.
3. Medscape References. Drug, Diseases and Procedures. Meropenem (Rx)-(Merrem IV). Available at: http://reference.medscape.com/drug /merrem-iv-meropenem-342565#0. Accessed on 25 September 2019.
4. Rondina MT, Walker A, Pendleton RC. Drug-induced thrombocytopenia for the hospitalist physician with a focus on heparin-induced thrombocytopenia. Hospital Practice. 2010;38(2):19-28.
5. Visentin GP, Liu CY. Drug-induced thrombocytopenia. Hematology/oncology clinics of North America. 2007;21(4):685-96.
6. George JN, Raskob GE, Shah SR, Rizvi MA, Hamilton SA, Osborne S, et al. Drug-induced thrombocytopenia: a systematic review of published case reports. Ann Intern Med 1998;129:886–90.
7. George JN, Aster RH. Drug-induced thrombocytopenia: pathogenesis, evaluation, and management. ASH Education Program Book. 2009;2009(1):153-8.