Methemoglobinemia Mimics Complicated Malaria

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Abstract:
Methemoglobinemia is an uncommon condition seen in clinical practice. It is generally caused by exposure to drugs, chemicals or solvents. Many drugs are implicated in the causation of Methemoglobinemia one of which is Chloroquine. We present here a case of Methemoglobinemia following Chloroquine which was given for the treatment of fever. The clinical presentation resembled closely to that of complicated Malaria. This case is presented with the objective of increasing awareness that uncommon illnesses can sometimes resemble closely to a very commonly seen condition and hence can be missed.

Key Words: Methemoglobinemia, Complicated Malaria

Introduction:
Methemoglobinemia is an uncommon condition seen in clinical practice. Whereas, malaria in our country is one of the commonest reason for admission to hospital. Here, we present a case report of drug induced methemoglobinemia which resembled the presentation of complicated malaria so closely that without the high index of suspicion, monitoring and investigating facilities of a tertiary care center, the diagnosis would not have been suspected and made. Incorrect diagnosis and inappropriate treatment could have caused more harm to the patient. This case is reported with the objective of increasing awareness that sometimes uncommon condition can closely resemble commonly seen ones and can be missed.

Case Report:
A 6 year old boy presented to the Department of Pediatrics with a history of moderate grade fever for 10 days, vomiting for 2 days with altered blood once. He had passed cola colored urine that morning although the total urine output was normal. On examination he had marked pallor, tachypnea, (30/min), pulse was 130 / min. normovolemic, had normal blood pressure and mild Jaundice. Oxygen saturation was 58% in room air. Chest was clear, heart sounds were normal, liver was just palpable and he was fully conscious and oriented. He had received oral Chloroquine prescribed by a local doctor before presenting to our hospital. There was no history of exposure to other drug, chemical or solvent. Our clinical impression was of Methemoglobinemia. We also investigated him for the cause of fever. He was given inhaled oxygen, packed cell transfusion, IV Ceftriaxone, Amikacin and IV fluids. Investigations showed Hb-6.1, WBC - 35,000 (neutrophils- 83%) and platelets- 6.1 lacs. CRP was positive in 1:4 dilution. Blood urea and creatinine were normal. Urine had 20 to 30 pus cells/ HPF but no RBCs. Peripheral smear showed evidence of hemolysis with reticulocytosis of 6%. G6PD activity was normal. Blood gas showed partial pressure of oxygen to be 110 mm Hg. Smear for malaria and malaria antigen test were negative. Our impression was of Methemoglobinemia and probable UTI. Due to financial constraints of the family Methemoglobin level estimation was sent on 3rd day of admission after 2 units of packed cells had been transfused. It was found to be raised at 27.5%, confirming the diagnosis of Methemoglobinemia. We added oral Ascorbic acid to the treatment. He was afebrile on 3rd day of admission and urine became clear. He made steady progress from 3rd day onwards and was discharged on 8th day with clear written instructions regarding the drugs to be avoided. Our final diagnosis was Chloroquine induced Methemoglobinemia with Urinary Tract Infection.

Discussion:
Oxidant exposure is generally the cause of acquired Methemoglobinemia as seen in exposure to drugs, chemicals or solvents or indirectly as in
sepsis. (Mansourie & Lurie, 1993; Hall et al, 1986; Ohashi et al, 1998; Kennedy et al, 1997). By oxidation the ferrous molecule in the hemoglobin gets oxidized to ferric, the resultant molecule is Methemoglobin, which is incapable of binding oxygen.

Levels greater than 2% are non physiological or abnormal. Symptoms generally appear when levels exceed 15% and levels > 70% may cause death (Rehman, 2001). Spectral properties of Methemoglobin are different and it interferes with pulse oximetry readings which are characteristically very low. Arterial blood gas partial pressures are very high because of high flow oxygen therapy. Hemolytic anemia with intravascular hemolysis may follow drug induced Methemoglobinemia as was seen in this patient. (Hall et al, 1986; Rehman, 2001).

This case illustrates an uncommon condition i.e. Methemoglobinemia precipitated by a very commonly used drug that is Chloroquine. The clinical scenario described here is very much similar to that of complicated malaria, the treatment on the contrary is totally different. (Bolyai et al, 1972).

Chloroquine is a very widely used drug in India especially in the periphery. Chloroquine induced Methemoglobinemia has been reported before. (Cohen et al, 1968; Sharma & Varma, 2003). The point being made here is that Chloroquine induced Methemoglobinemia with intravascular hemolysis as seen in our patient mimics the clinical picture of complicated Malaria. One should have a high index of suspicion and low threshold for investigations where cases are complicated. In the periphery, where investigation facilities are limited and even simple monitoring facilities like pulse oximetry are unavailable, early referral to higher centers in the event of complications is recommended.

**Bibliography:**