Case Report

Methaemoglobinemia in pregnancy

Amey Chugh[*], Pallavi Gurav[**], Shubhangi Mande[***], Swati Shiradkar[****]

[*]Chief Resident, [**]Senior Resident, [***]Associate Professor, [****]Professor and HOD, Department of Obstetrics and Gynaecology M.G.M. Medical College and hospital, Aurangabad– 431003, Maharashtra, INDIA.
Email: ameychugh17@gmail.com

Abstract

Methemoglobin is an oxidized form of hemoglobin with iron in the ferric form instead of the usual ferrous form, which results in decreased availability of oxygen to the tissues. Methemoglobinemia occurs when R.B.C.s contain methemoglobin higher than 1 %. It is a well known but frequently forgotten cause of hypoxia and respiratory distress in patients of all ages. As most patients are asymptomatic, congenital form may be diagnosed for the first time during pregnancy.

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[*]**Address for Correspondence:**
Dr. Amey Chugh, Chief Resident, **Senior Resident, ***Associate Professor, ****Professor and HOD, Department of Obstetrics and Gynaecology, M.G.M. Medical College and hospital, Aurangabad– 431003, Maharashtra, INDIA.
Email: ameychugh17@gmail.com

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INTRODUCTION

Methemoglobin, along with carboxyhemoglobin and sulfhemoglobin are types of dyshemoglobin i.e. a type of hemoglobin that does not bind with oxygen. Tissue hypoxia is due to reduction in levels of free hemoglobin hence difficulty in release of oxygen. Congenital methemoglobia is a rare genetic abnormality in which patient is asumptomatic and presents with cyanosis which may be present since birth. During pregnancy, it may lead to uteroplacental insufficiency causing intrauterine growth retardation, oligohydramnios, severe preemclampsia and abruption.

CASE REPORT

A 20 year old Rh negative primigravida with 9 months of amenorrhoea was referred to our hospital with complains of dysnoea on exertion and mild cyanosis in both the hands (nail beds) since 2 weeks. Patient had no other complaints. On past history, patient had episodes of dysnoea during 2nd trimester which were relived on rest and without any medication. On examination, she had mild cyanosis in both the hands (nail beds), her vitals were stable. On pulse oxymeter her saturation was 90 % at room air. Obstetric evaluation was normal. There were no abnormalities on examination of respiratory and cardiovascular system. Her outside investigations revealed Hb of 17.4 gm% and outside 2 D ECHO suggestive of normal study. In regard to cyanosis and dysnoea, physician call was done and patient methemoglobin levels were checked which turned out to be 24 %. She had no history of any drug intake like nitrates, sulfonamides, acetaminophen, anticonvulsants, valproic acid, dapsone, nitroglycerin. Laboratory investigations in our hospital revealed: Hb-14 .1 gm%, PCV -40.8 %, TLC - 9160/ cmm, platlets- 2,05,000/cmm. Liver and renal function tests were within normal range. Arterial blood gases revealed normal pH and oxygen saturation. USG was s/o Slingle live intrauterine pregnancy of 37-38 weeks with adequate liquor.

Physician opinion was sought and she was adviced vitamin C tablets and methylene blue tablets twice daily and if required Inj. methylene blue in case of dysnoea and monitor for signs of hypoxia. She was monitored for 3 days and was given propped up position with intermittent oxygen. Her daily pulse oxymeter saturation was checked and revealed an average of 90 % at room air with fluctuation between 88 to 93 % at room air, and methemoglobin level was repeated. She was taken for LSCS i/v/o CPD (cephalo-pelvic-disproportion) under general anesthesia. Intra op arterial blood gases was

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normal .Blood was slightly dark coloured. Surgery was uneventful. Anaesthetist had advised intermittent oxygenation and avoid paracetamol post-op . Patient was kept in ICU care for one day post operative in anticipation of signs of hypoxia. Baby examination revealed no signs of cyanosis and was extremely normal patient was shifted to ward on day 2 and was given Inj. Anti -D as baby's blood group was be positive. Repeat CBC done on post op day 3 as a routine was normal. Repeat meth hemoglobin levels were 19 %.G6PD levels were normal. Patient was stable and discharged on Day 10 and advised vitamin C tablets twice daily.

DISCUSSION

Causes of cyanosis includes those with decreased Pao2 and SO2 including cardiac right to left shunts and respiratory disorders and those with normal Pa O2 and SO2 including Methaemoglobinemia. Our patient had cyanosis with normal PO2 and SO2 with no findings on ECG and 2 D ECHO. These ruled out cardio-pulmonary causes and indicated the possibilty of rare etiology of cyanosis. Moreover, our patient had polychytemia, indicating some haematological abnormality. Methaemoglobin is a rare disorder of haemoglobin molecule with high oxygen affinity causing tissue hypoxia. Methaemoglobin is present in small amounts in normal individuals (< 1.9 gm% and up to 2.8 gm%) in full – term neonates. The patient is cyanosed when the level is more than 10 % and may not become symptomatic (headache, breathlessness) even when the level is more than 40 % while level of more than 75 % is incompatible with life. Ascorbic acid (which reduces methaemoglobin) and methylene blue are used to treat methaemoglobinemia. In our patient methylene blue could not be used, so only ascorbic acid theory was advised. Presence of cyanosis without any cardiopulmonary disorder or decrease in oxygen saturation, and an appearance of "more blue than sick" are diagnostic.[1] Symptoms depend upon percentage of methemoglobin in blood:

Table 1: Combined efforts of obstetrician and anesthetist contributed towards effective management of this case

<3%	asymptomatic
3 – 15 %	grayish skin color
15 - 30 %	cyanosis and chocolate brown blood
30 – 50 %	dyspnea, headache, fatigue, dizziness, syncope, with oxygen saturation as low as 80 %, as seen in our case
50 – 70 %	tachypnea, metabolic acidosis, cardiac arrhythmias, seizures, CNS depression and coma[2]

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