Methemoglobinemia: a challenge while managing pneumocystis jirovecii pneumonia

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We read with great interest the recent article by Saxena et al on methemoglobinemia. We appreciate the diligent workup by Saxena et al that led to the timely diagnosis of the methemoglobinemia.

Patient reported by Saxena et al had a hemoglobin value of 10.3gm/dl. The anemia in the index subject was probably multifactorial-nutritional deficiency, anemia of chronic disease or secondary to bone marrow depression due to methotrexate use. Methemoglobinemia can also be associated with intravascular hemolysis, which is another common cause of anemia. The same was ruled out in the index case by confirming a negative hemolytic workup (normal values for unconjugated bilirubin, haptoglobin, lactic acid dehydrogenase and glucose-6-phosphate dehydrogenase).

Using methylene blue (MB), the antidote for methemoglobinemia has two major hurdles; first, it is not universally available; and second, caution while using in patients with known or suspected G6PD deficiency. Knowing about the local disease burden of G6PD deficiency is important as it is the most common human enzyme defect, affecting approximately 400 million population globally. A recent meta-analysis (72 studies, sample size of 38,565) on the Indian population showed the overall magnitude of approximately 8.5% (varied from 0–27% depending on regional and ethnic background). As G6PD is a X-linked disease, males usually show full-blown disease while the majority of females remain unaffected carriers. Other known contraindications to use MB are hypersensitivity to MB, cyanide poisoning-related methemoglobinemia and severe renal impairment.

Saturation gap of 8% in index case was well above the value of 5%, which is considered as a threshold of significant gap. In small centres where Evelyn-Malloy method of methemoglobin is difficult to detect, a more handy way to quantify methemoglobin is Rad-57 pulse oximeter, which uses eight-light wavelengths of light instead of the usual two.

Pneumocystis pneumonia (PCP) is a very challenging disease, especially in immunocompromised individuals. We recently addressed the cost-benefit analysis of using dapsone as PCP prophylaxis in transplant patients that also has a potential to cause methemoglobinemia. As mentioned by Saxena et al, MB is the only FDA-approved antidote of choice for methemoglobinemia. Ascorbic acid, cimetidine and riboflavin are few other drugs that can be used as adjunctive therapy with variable outcomes. Hyperbaric oxygen therapy and red blood cell exchange can be considered in refractory cases or when conventional therapy is contraindicated.

In conclusion, the index case illustrates the therapeutic and diagnostic challenge while approaching a suspected case of methemoglobinemia. Early recognition, timely removal of the inciting drug, and treatment can avert the fatality related to methemoglobinemia.
Competing interests:
Nil.

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