Methemoglobinemia Secondary to Herbal Products

Dear Editor,

We read with interest the recent article by Al-Qahtani *et al.* regarding methemoglobinemia in a young boy.[1] We would like to discuss few other essential points that we believe to be important for *Saudi J Med Med Sci* readers to have a comprehensive understanding of this topic.[2,3]

While there seems to be a good temporal correlation between *Ferula asafoetida* ingestion and the development of methemoglobinemia in the case reported, we still strongly recommend that in such cases, a comprehensive workup should be performed to rule out congenital methemoglobinemia. In young patients, we should be very cautious and always consider congenital methemoglobinemia before labeling them as a case of acquired methemoglobinemia. We recommend genetic testing for cytochrome b5 reductase deficiency and hemoglobin (Hb) M to ensure that in such cases, the child is free from any genetic perturbations that can put him/her at risk for the recurrence of methemoglobinemia in future.[4] Hb M is a special variant in which heme iron can undergo auto-oxidation, resulting in methemoglobinemia. The common Hb M variants are Hb M-Boston, Hb M-Iwate, Hb Auckland, Hb Chile, Hb M-Saskatoon and Hb M-Milwaukee.

Food products such as frozen items may have high nitrate content, and there have been reports of clusters of cases with many family members developing methemoglobinemia because of frozen food consumption.[5] In addition, it should be noted that rarely used topical agents such as eutectic mixture of local anesthetic cream, e-cigarettes, contaminated water and other herbal medicines such as choy sum can lead to methemoglobinemia.[6]

In the case reported by Al-Qahtani *et al.*, it is unclear why the patient had anemia of 10.4 g/dl and leukocytosis of 24,000/mm. Did the authors look for hemolysis in this case and what was the likely explanation of the high white blood cell count? Getting a serum lactate dehydrogenase and other hemolytic panel such as serum haptoglobin, direct antiglobulin test and peripheral blood smear would be beneficial to rule out concomitant hemolysis that can be associated with methemoglobinemia.[7]

The family history is very relevant in this case, as rightly explained by Al-Qahtani *et al.*[1] As per the history provided, both the brothers of the infant had glucose-6-phosphate dehydrogenase (G6PD) deficiency. However, we recommend that the parents should also be checked for this deficiency. In case of a male boy, there is a 50% chance of having a G6PD deficiency if the mother is a carrier. Therefore, genetic testing of parents is mandatory to predict the likelihood of transmitting the condition to children.

Methylene blue (MB) is the drug of choice in the management of methemoglobinemia. In the case reported by Al-Qahtani *et al.*, MB was not given for the fear that he may be positive for G6PD deficiency given the strong family history. This patient was critically sick and mechanically ventilated. We are not sure about the logistic resources at the author's medical center, but a rapid fluorescent spot test for G6PD deficiency is now readily available, which can confirm G6PD deficiency in as early as a few minutes.[8] This patient was not given either MB or vitamin C and instead was successfully treated with hyperoxic ventilation. This is a great learning case, but we wish to reinforce the fact to the readers that MB should be the first choice and all efforts should be made to check the G6PD status so that patients are not denied the standard of care. It should also be noted that in addition to MB and ascorbic acid, other drugs such as riboflavin and cimetidine can be used to treat methemoglobinemia with variable outcomes.[3]

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Conflicts of interest

There are no conflicts of interest.

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