

## Methylene Blue Use: Is It Safe?

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Dear Sir,

Anaphylaxis reaction to blue dyes used in medical practice is a major concern for health care providers. Several blue dyes are now in use like isosulfan blue, patent blue V and methylene blue. These dyes are used for lymphography, sentinel lymph node biopsy, tube patency test, detection of fistulae and delineation of body tissues. Beside the high cost, the use of these dyes can cause anaphylactic reaction which is of serious concern. The adverse reaction can be allergic or nonallergic. Adverse skin reaction and life-threatening anaphylaxis is less common with methylene blue, but a recent case forced us to review the situation.

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A 35-year-old P2L1 presented to gynaecological out-patient department of Deen Dayal Upadhay hospital New Delhi on 20-02-2018 with history of laparoscopic ligation 4 years back and eagerness to conceive after the death of her second child. She had been married for 9 years and had two uneventful normal vaginal deliveries. Her younger child expired 6 months back at the age of 4 years in a road traffic accident.

There was nothing significant in her past history, general physical and systemic examinations and haematological and biochemical investigations. She was posted for tubal recanalisation surgery under spinal epidural anaesthesia. After 25–30 min of uneventful anaesthesia and surgery, 8–10 ml of 1% methylene blue was instilled in the uterus intracervically to delineate tubal blockage. Within four to 5 min of dye injection, the patient suddenly developed severe bradycardia (30–35/min). However there was no cyanosis or bluish discoloration of any body part. Surgery was stopped immediately, atropine was administered, and the patient was intubated. Cardiopulmonary resuscitation was started, and patient was revived. Intraoperative decision was taken to postpone the surgery, and patient was shifted to intensive care unit. Patient was hemodynamically stable during intensive care unit stay and was extubated on day two of surgery and shifted out of intensive care unit on day three of surgery in stable condition. Patient was normal in routine follow-up 6 weeks post-anaphylaxis episode.

Extensive review of the literature revealed only few cases of severe anaphylaxis after nonsystemic

administration of methylene blue. Methylene blue probably inhibits guanylate cyclase, thus decreasing cyclic guanosine monophosphate and vessel relaxation in vascular smooth muscle [1]. Trikha et al. [2] reported a case of pulmonary oedema after intrauterine methylene blue injection. In his study, the patient developed oxygen desaturation after 2 min of intravenous injection of methylene blue. Five minutes later, the patient developed crepitation and cyanosis. In another case, the patient developed cyanosis and restlessness and her oxygen saturation declined 15 min after intrauterine instillation of methylene blue [3]. The patient could not be revived. On postmortem findings, the lungs were congested, oedematous and blue stained, with features suggestive of pulmonary oedema. Dewachter et al observed severe immunoglobulin E-mediated hypersensitivity reaction to 1% methylene blue [1]. Mhaskar reported methemoglobinemia following chromopertubation in a treated pelvic tuberculosis case [4]. So, whenever methylene blue is used for chromopertubation, the possibility of potential dangerous complications should be borne in mind. Hence, clinicians need to be vigilant during intraoperative period after the use of methylene blue. Cardio respiratory and

anaesthesia support should be available to avoid mortality and morbidity of patients.

An informed consent and permission was taken from the subject for the publication of her case.

#### Compliance with Ethical Standards

**Conflict of interest** All authors declare that they have no conflict of interest.

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