Alarming medication error with prostaglandin E1 (PGE1) in a term neonate with critical congenital heart disease

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DESCRIPTION

An outborn full-term female newborn with birth weight 2.45 kg was admitted to our centre at 24 hours of life with respiratory distress and cyanosis. The baby had tachycardia and oxygen saturation (SpO_2) 40% at admission to neonatal intensive care unit (NICU). She was mechanically ventilated on synchronized intermittent mandatory ventilation (SIMV) mode. Clinical evaluation raised suspicion of critical congenital heart disease; echocardiogram revealed transposition of the great arteries with 6 mm ostium secundum atrial septal defect and small patent ductus arteriosus. The baby was started only on intravenous prostaglandin E1 (PGE1) as per unit protocol, where 1 ampoule (500 µg) of PGE1 is mixed in 49 mL of 5% dextrose yielding a concentration of 10 µg/mL and is then started using an infusion pump at a rate of 0.6 mL/kg/hour to provide a dose of 0.1 µg/kg/min. She developed tachycardia along with confluent erythematous macules over the scalp, face, neck and trunk, 10 hours after starting PGE1 infusion (figure 1). There was no associated fever or hypertension, while lowest blood pressure recorded was 52/30 mm Hg. The skin rash, characterised by bright erythematous macular lesions, rapidly spread to the extremities. It was noticed that PGE1 was wrongly administered at 10 times the expected dose for the last 2 hours prior to the cutaneous manifestation. The infusion was immediately stopped, and the baby was given a single dose of intravenous hydrocortisone and diphenhydramine. The rash demonstrated a prompt response and subsided within 1 hour. Postnormalisation of heart rate, PGE1 infusion was restarted after 4 hours, and subsequent infusion was uneventful.

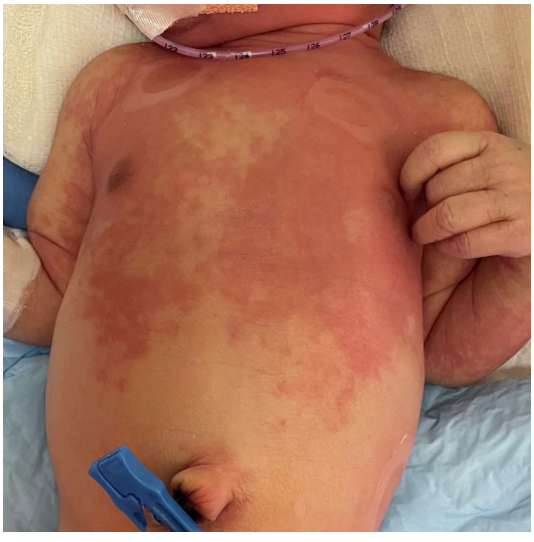

Figure 1 Cutaneous rash due to overdose of PGE1. PGE1, prostaglandin E1.

Neonates admitted to NICU are at high risk of medication error.[1] Children as compared with adults are three times more likely to be involved in medication error.[2] A recent systematic review reports it to range from 5.5 to 77.9 per 100 medication orders. Prescribing and dosing errors are most frequently noted in NICU.[1] Reporting medication error can improve quality of patient care but is generally under-reported. PGE1 is a common drug used in NICU in management of duct dependant cardiac lesions.[3] PGE1 overdose in newborn is rarely reported in medical literature. Only two previous case reports are available. Mrvos *et al* first reported prostaglandin overdose in a newborn.[4] A neonate was administered intramuscular carboprost instead of hepatitis B vaccine. The baby developed hyperthermia, tachypnoea, tachycardia and hypertension, which resolved in 18 hours. Gorodetsky *et al* reported PGE1 overdose at 200 times of intended dose for a duration of 15 min on day 1 of a term newborn.[5] The neonate manifested with bradycardia, hypotension, desaturation and was managed conservatively. Our case had significant cutaneous manifestation which is a rare adverse effect of PGE1 infusion.[3] We also managed the newborn conservatively, highlighting the need of only supportive care at any such instances. Staff and residents were educated on the types of medication error. Root cause analysis was followed by education, discussion on various roles and responsibilities, confidence building on reporting medication errors, effective prevention strategies including use of infusion pump with integrated protocols, appropriate documentation and hand-over, and reinforcement of safe medication practices.

Learning points

- Cutaneous manifestation is a rare adverse effect of prostaglandin E1 infusion.
- Medication error with prostaglandin E1 responds well to conservative management.
- Education on safe medication practice is paramount to prevent recurrences.

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Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

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