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Subject: FW: Another accidental indistinct chlorhexidine injection [SEC=UNCLASSIFIED]
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FYI

From: [REDACTED]
Sent: Wednesday, 18 January 2017 9:08 AM
To: [REDACTED]
Subject: FW: Another accidental indistinct chlorhexidine injection [SEC=UNCLASSIFIED]

[REDACTED] and [REDACTED]
[REDACTED] seemed to miss out on this one
[REDACTED]

[REDACTED]
Director, Medicines Shortages Section
Pharmacovigilance and Special Access Branch
Health Products Regulation Group
Department of Health
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Sent: Tuesday, 17 January 2017 6:17 PM

To: [REDACTED]
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Subject: Another accidental indistinct chlorhexidine injection [SEC=No Protective Marking]

Accidental abdominal rectus sheath infiltration with chlorhexidine-alcohol

Tess Brian, Winston McEwan

Case report

A 43-year-old Caucasian female underwent abdominal rectus divarication repair, abdominoplasty and liposuction of hips and legs under general anaesthesia at a private hospital in January 2016.

Shellfish allergy was reported by the patient. So, perhaps unnecessarily,¹ the surgeon's usual pre-surgery skin antiseptics with povidone-iodine was abandoned. Instead, faintly tinted chlorhexidine gluconate (0.5% w/v)-isopropyl alcohol (70% v/v) was used. Then, anticipating that further leg preparation may be required during the procedure, the unlabelled transparent bowl of residual solution was placed on the corner of the instrument trolley.

Standard liposuction, abdominoplasty and plication of the rectus sheath were performed.

Local anaesthetic was poured into an unlabelled transparent bowl on the trolley. The scrub-nurse drew 20mls into a syringe. As part of a multimodality approach to post-surgery pain relief, this was infiltrated as a rectus sheath block on one side. The surgeon then reloaded the syringe from the bowl on the corner of the trolley and injected the contents on the second side. It was immediately realised that 20mls of chlorhexidine-alcohol had been injected in error.

Aspiration was quickly used to remove chlorhexidine-alcohol from beneath the sheath. Ten millilitres of fluid were recovered, leaving perhaps up to 50mg of chlorhexidine and 7ml of isopropyl alcohol in situ. Intravenous fluid administration was increased. The National Poisons Centre was contacted and an internet search conducted. Consequently, other than more intensive vital sign monitoring, no further interventions were undertaken.

On the first post-operation day, the wound and patient had suffered no apparent ill-effect. Elevations of serum alanine transaminase (104 units/l: normal ALT<45) and gamma-glutamyl transferase (232 units/l: normal GGT<50) were noted. These had returned to normal four days later.

Post-operation, the abdominal site healed routinely.

The patient has made a full recovery. However, the outcome may have been different.

Discussion

Skin disinfectants are not for parenteral administration. Intravenous, intra-arterial and intrathecal injection of these may cause local and distant tissue damage, and result in organ failure and death. When locally infiltrated, transient and permanent local tissue damage may occur. However, the authors have found no cases in the literature of significant morbidity or mortality from localised injection of chlorhexidine-alcohol.²

Cytotoxicity of chlorhexidine in varying concentrations and exposure times continues to be reported.³⁻⁶ And the sclerosing and neurotoxic effects of alcohol are used clinically. That such damage from these agents was not apparent clinically in this case may have been because of the injection site and/or early recognition of the error with prompt aspiration.

While acute chlorhexidine hypersensitivity with anaphylaxis is uncommon (but increasingly recognised), vigilance needs to be maintained.⁷ Although no such reaction occurred in this case, parenteral administration may increase the risk.^{8,9} Therefore, in these circumstances, the possibility of both toxic and hypersensitivity contributions to any systemic changes exhibited by the patient should be considered.

The lessons from this incident for theatre policy and surgical practice both in and out of theatre are:

1. **Only highly tinted skin preparation solutions to be used.** Recognisably coloured external-use preparations should be easily differentiated from clear injectables such as local anaesthetic.
2. **Skin preparation solutions to be handed off the sterile field immediately after use.**
3. **All injections to be prepared in closed systems.**^{10,11} When non-in-
- jectable and injectable solutions are kept in proximity in "open systems" such as bowls in the sterile field, there is potential for confusion. Medication for injection should not be kept in bowls. All injections should be drawn from source bottles or ampoules directly into the syringes to be used.
4. **All syringes containing injectable medicines to be labelled**^{10,11} (preferably with pre-printed labels). The source container and labelled syringe should be checked at drawing-up and before medication administration.

Competing interests:

Nil.

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