Epidural Anesthesia and Heel Damage: This study aimed at reducing heel damage in acute surgical patients prescribed epidural anesthesia and analgesia (EA). Patients suffering cardiovascular disease, multiple co morbidities, smoking and chronic pulmonary disease were found at increased risk of heel damage. Research findings may assist surgical risk assessment and outcomes for this patient cohort.

CHRIS BATTERSBY RND1, Cert AAN, Cert CNE, MNS
(Epidural Educator, St John of God Hospital Bendigo, Australia)

WILLIAM MCGUINESS Dip T.B Ed, MNS, MRCNA, PhD
(Senior Lecturer, La Trobe University Bundoora, Australia)

1. Background

- Sensory deficit increases risk of pressure damage 34 fold
- Two patients prescribed epidural anesthesia/analgesia (EA) suffered heel damage requiring further surgery
- Heel protective devices are advised for these patients, however current selection was by availability rather than manufacturers' recommendations

2. Research Aims

- Prevent heel damage
- Compare heel condition with intrinsic (innate) factors
- Compare heel condition with extrinsic (external) factors
- Compare heel condition with the two heel protective devices available in all clinical areas
- Contribute to the evidence-base of a relatively neglected area of nursing practice

3. Method

- Heels protected in operating room (OR) with polymer devices
- Changed in Post Anaesthetic Care Unit (PACU); polymer under left heel and inflatable under right heel
- 29 participants allowed 58 heel observations and followed for 24 hours
- Heel condition was the outcome measurement of this study
- Comparisons of intrinsic variables and heel condition included age, gender, weight, cardiac, vascular, pulmonary and metabolic conditions
- Comparisons of extrinsic variables and heel condition included heel protectors, anti-embolic stockings (TEDS) and hours in OR

4. Data Collection

Our aim was to prevent heel damage; hence a modified system of heel staging was used.

- Heel stage 0 = no sign/symptom of damage
- Heel stage 1 = blanching erythema
- Heel stage 2 = non-blanching erythema present
- Heel stage 3 = pain or altered tissue texture

Ethics approval granted. All heel damage was completely reversed within 24 hours.

5. Figure showing heel protectors found on wards and use in trial

LEFT HEEL
Polymer device
(Designed for OR use)

RIGHT HEEL
Inflatable device
(Designed for ward use)

Photos used with permission

6. Findings

- Heels are vulnerable to pressure in this patient population and found to be linked to both intrinsic and extrinsic factors

Intrinsic factors:

- Age and body weight was not linked with heel damage (p=0.04). However, significantly higher in females (62.5%, n=5) compared to males (37.5%, n=3)
- Cardiovascular disease (OR=4.0) and multiple Comorbidity (OR=1.3) were associated with heel damage
- 100% of participants who smoked and suffered chronic obstructive pulmonary diseases (COPD) were found to have pain and altered heel texture without any colour change

Extrinsic factors:

- Heel damage prevalence (13.8%, n=8) was almost halved (25.8%,n=15) by recognising blanching erythema as an early sign of pressure and changing polymer to inflatable post surgery
- No damage was found when heels were protected by polymer intraoperatively and changed to inflatable device in PACU
- TEDS impacted heels. The majority of heel damage (87.5%,n=7) developed when TEDS were used continuously
- Heel damage occurred in as little as 2 hours intraoperatively

Unexpected finding:

- A higher prevalence of heel damage was found in patients ***without*** motor deficit (62.5%,n=5)

Limitations:

This study was limited by its small size. However, data generate may benefit any future large studies.

7. Conclusions & Recommendations

- Patients receiving EA are at risk of heel damage
- Heel protection is essential for this patient population
- Selection of heel protection according to manufacturer's recommendations both intra and postoperatively may assist in reducing heel damage formation in surgical patients
- Early and prompt response to blanching erythema may reduce the incidence of heel damage in this patient population
- Patients suffering cardiovascular disease, smoking, COPD and multiple disease burdens may be at increased risk of heel damage in this postoperative cohort
- TEDS impact heels. Full removal more frequently than daily may reduce heel damage
- Full mobility may not prevent heel damage when sensory deficit exists
- Inclusion of appropriate heel protection in epidural hospital policies may improve outcomes for this patient cohort

ACKNOWLEDGEMENTS

The authors wish to thank the staff and patients of St John of God Hospital, Bendigo, Victoria, Australia for their support and assistance in this study. Also, many thanks to Action Products Inc. (Chris McElroy), Edwards Medical (Richard Quinsey), Elite Medical (Wayne Sanderson), Ebos Group Pty Ltd. (Dean Harding, Frank Leonhard) and Frontier Medical Group (Rachael Bowden) for the use of photos and support throughout this study.

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Contact details: christinebattersby@hotmail.com