Pressure redistribution properties of prophylactic dressings using an *in vitro* model with clinically relevant pressures and a novel heel indenter

[Poster #]

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Introduction

- Recent clinical studies indicate that multilayer foam dressings may be an effective addition in the prevention of hospital-acquired pressure injuries[1,2]
- *In vitro* work has further demonstrated that these dressings can absorb and redistribute forces applied directly to the skin[3]

Study Objective

To evaluate pressure distribution properties of commercially available wound dressings used in high-risk body areas when applying clinically relevant interface pressures, using a novel heel indenter[3,4]

Methods

- Five dressings were evaluated: A, B, C, D, and E
- A high-resolution pressure mapping system was used to test the pressure redistribution properties of the dressings
- The dressing was applied to a 6 mm thick silicone gel[5] layer (to simulate overlying tissue), and a clinically relevant load (80 mmHg, representing a patient in the supine position)[6] was applied for 60 seconds using a novel heel indenter. A control was performed using the same set up without a dressing applied (Figure 1)
- Contact area and average and peak contact pressures were recorded (6 replicates were performed)

Figure 1. Set up for testing

Dressings were placed under silicone gel and on top of pressure map

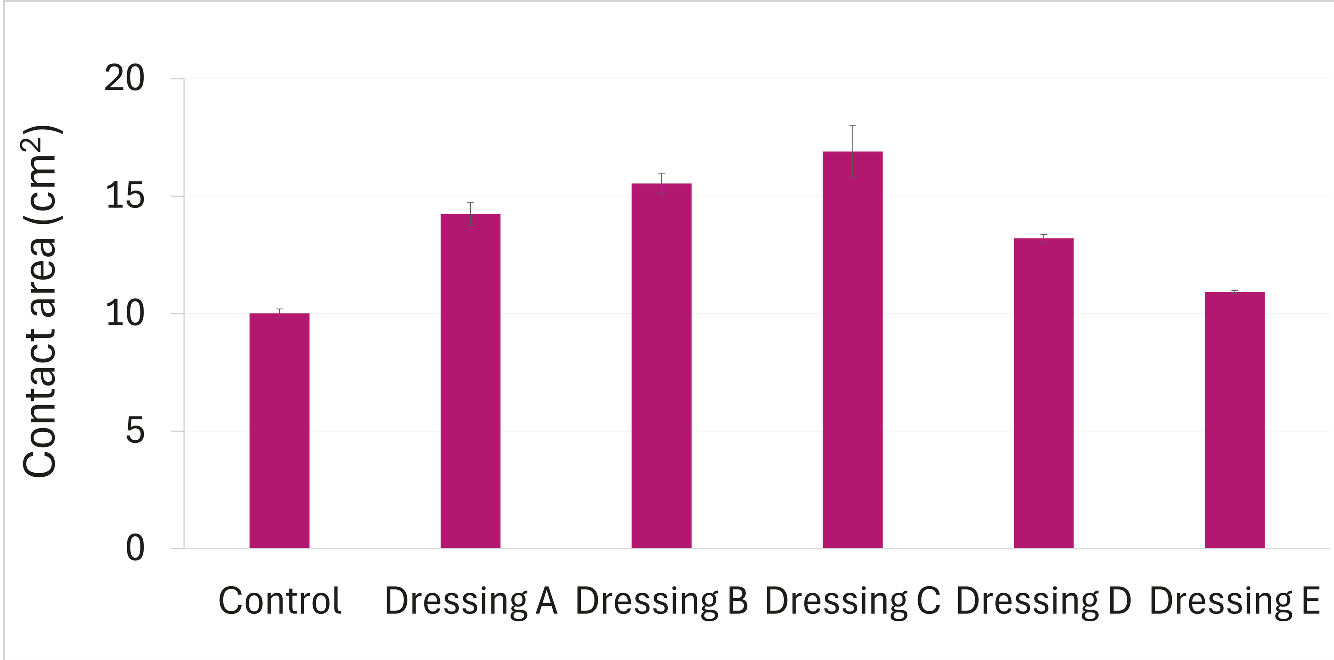
Results

- All dressings showed a significant reduction in peak and average pressure and an increase in contact area compared with the no dressing control (p<0.001; Figure 2 and Figure 3)
- Dressings A, B and C showed a statistically significant reduction in both peak and average pressure compared with dressings D and E (p<0.001; Table 1)

Figure 2. Comparison of the peak pressure of tested products

Error bars represent 95% confidence intervals

Figure 3. Comparison of the contact area of tested products



Error bars represent 95% confidence intervals

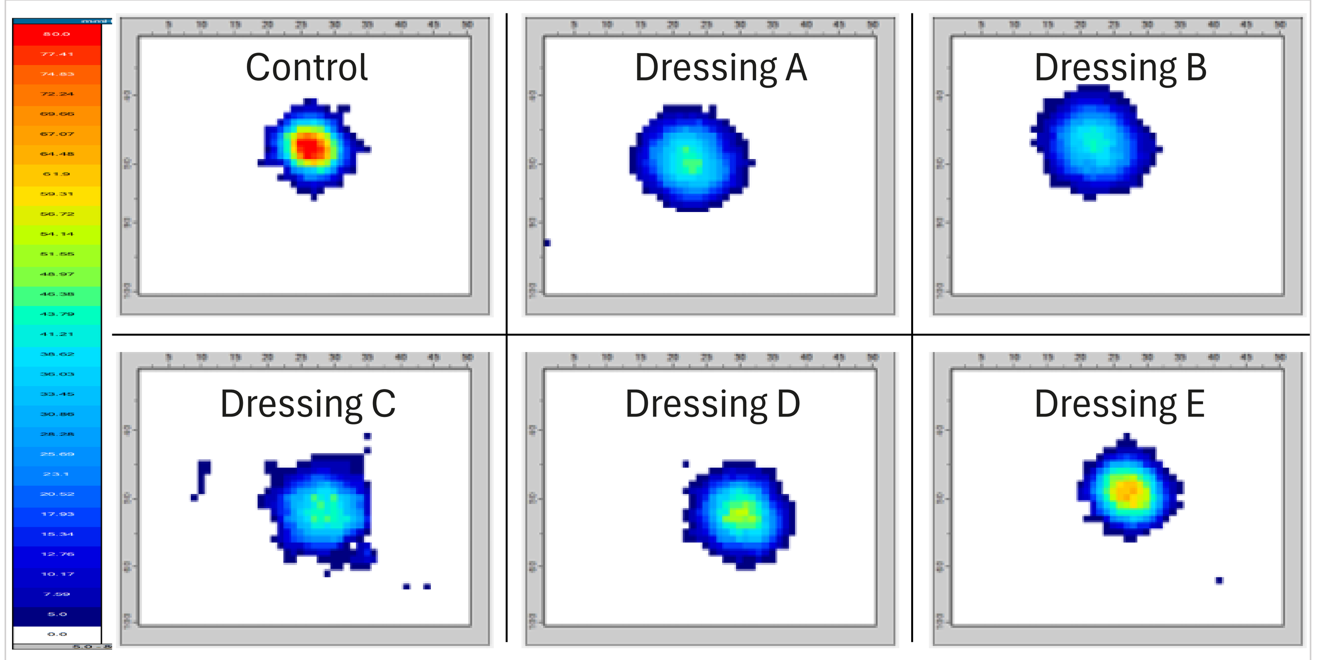
- Dressing B is significantly lower than Dressing A in peak and average pressure (p<0.05; Table 1). Dressing C shows a significantly lower average pressure than Dressing A, but not peak pressure (α=0.05)
- Figure 4 shows the pressure map images of all the dressings and control

Table 1. Comparison of metrics calculated (α=0.05)

Product tested	Contact area (cm^2)	Peak pressure (mmHg)	PPI (mmHg)	Average pressure (mmHg)
Control	10.01 ± 0.19	85.02 ± 1.98	77.77 ± 1.40	28.87 ± 0.42
Dressing A	14.25 ± 0.49	49.72 ± 1.10	45.65 ± 0.85	20.30 ± 0.39
Dressing B	15.54 ± 0.44	45.56 ± 2.21	42.61 ± 1.64	18.44 ± 0.24
Dressing C	16.90 ± 1.12	47.77 ± 2.16	43.22 ± 1.66	17.59 ± 0.99
Dressing D	13.21 ± 0.16	57.88 ± 2.54	51.76 ± 1.37	21.45 ± 0.27
Dressing E	10.92 ± 0.07	69.00 ± 1.93	63.51 ± 1.24	25.74 ± 0.28

PPI, peak pressure index

Figure 4. Comparison of pressure map images



Discussion

- Using an anatomically accurate heel indenter and clinically relevant testing pressure, these findings indicate that dressings A and B provide a significant reduction in interface pressure compared with no dressing, as well as a reduction compared with most other test dressings

Conclusion

These data suggest that these dressings may be considered as a component in the toolkit of pressure injury prevention protocols

References

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