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ABSTRACT BOOK

STINTS1

SILVER-CONTAINING GELLING FIBRE PRIMARY DRESSINGS: FLUID HANDLING (SORPTIVITY) AND DURABILITY PERFORMANCES TESTED ON A ROBOTIC WOUND SYSTEM

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Introduction: An adequate wound dressing should protect the wound mechanically and biologically while effectively managing the exudates. Laboratory (pre-clinical) tests of dressings are typically too simplified for capturing clinically relevant scenarios where a dressing is required to fulfil all the above roles at the same time.

Methods: A novel robotic phantom system containing 6 identical wound simulant units has been developed and employed to determine the synergy in fluid handling of two commercially available silver-containing gelling fibre primary dressings when used with a secondary foam dressing, as per clinical practice. The durability of the primary dressings post simulated use was further investigated, through tensile mechanical testing.

Results: The silver-containing gelling fibre primary dressing incorporating polyvinyl alcohol (PVA) fibres delivered greater fluid amounts for absorbency and retention by the secondary foam dressing (sorptivity), approximately 2-fold and 1.5-fold more than the comparator silver-containing primary dressing incorporating sodium carboxymethyl cellulose CMC) fibres, after 10 and 15 hours of simulated use, respectively. The PVA fibre-based primary dressing type further demonstrated greater post-use mechanical strength that was ~4-times and ~6-times greater than that of the comparator primary dressing, when the latter dressing was tested out-of-alignment with its seams, after 10 and 15 hours of usage, respectively.

Conclusions: The PVA fibre-based primary dressing type had better sorptivity and durability than the comparator product. The present work contributes towards the development of clinically relevant testing methods for wound dressings and importantly, takes another important step forward in standardisation and automation of the performance measurements of dressings. Our work also revealed the dynamics of the fluid sharing between primary and secondary dressings, and underpinned the importance of mechanical durability of primary dressings which facilitates their safe removals.

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