The IL6, TNF-α, and TGF-β Levels in Serum in Children with Treated by Different Burn Dressings

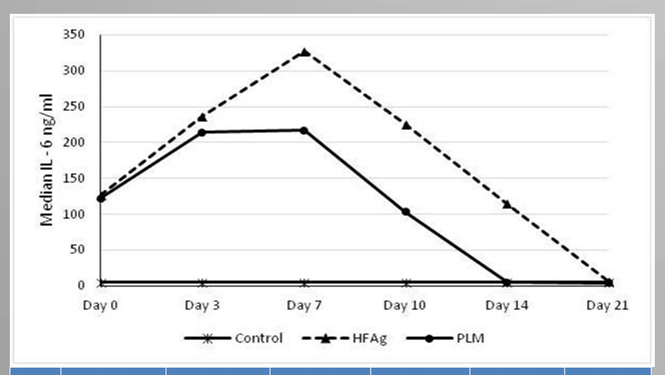
Searching of the ideal burn wound dressing continues…

Silver based dressings have been used for many years. Are they still gold standard? Well, are they safer than other dressing?

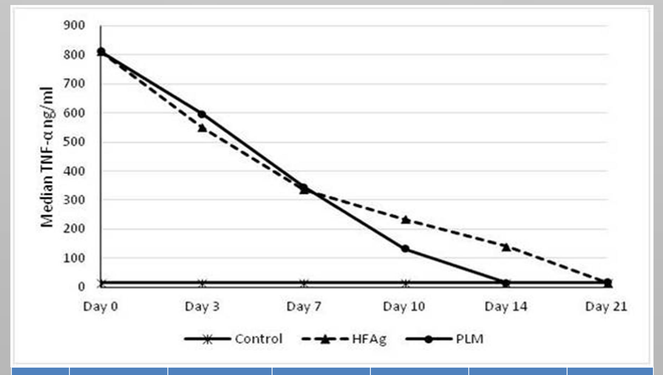
In burns, IL-6 concentrations are significantly increased when compared to IL-6 levels in non-burn volunteers. Detection of IL-6 in serum is significantly greater in non-surviving versus surviving burn patients at all time points between the time of admission and time of death or discharge. TNF-α is an important factor in wound healing due to its role in the early immune response when secreted by activated macrophages. TNF-α may also influence wound healing through direct action on keratinocytes and endothelial cells, thereby impacting epithelialization and vascularization. Therefore TNF-α may be a good therapeutic target to improve wound healing in burns. Transforming growth factor (TGF)-beta is essential for activation and proliferation of fibroblasts during the initial stage of wound healing. After burn trauma, TGF-β plays an important role in wound healing, in providing tissue tensile strength and tissue elasticity.

Aim: To investigate how two different wound dressings (PLM, HFAg) used in partial thickness acute burn treatment were able to change IL-6, TNF-α and TGF-β level in serum

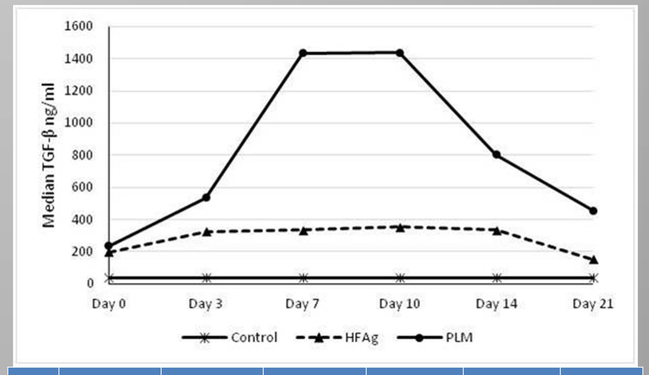
Material & Methods: There were three groups (PLM, HFAg and control), each consisting of 22, 21 and 22 children with partial thickness burns, respectively. A different dressing was applied to each group. Serum were collected at the end of 4 weeks of treatment. In these cases we investigate how IL-6, TNF-α, and TGF-β levels changed.



Groups	Day 0	Day 3	Day 7	Day 10	Day 14	Day 21
Control (n=22)	4.53 (1.29-9.24) ^{x}	4.53 (1.29-9.24) ^{x}	4.53 (1.29-9.24) ^{x}	4.53 (1.29-9.24) ^{x}	4.53 (1.29-9.24) ^{x}	4.53 (1.29-9.24) ^{x}
HFAg (n=21)	126.28 (19.53-211.47) ^{y}	236.28 (155.28-342.83) ^{y}	326.96 (215.13-427.63) ^{y}	225.13 (155.28-427.63) ^{y}	114.5 (35.03-188.01) ^{y}	6.44 (2.6-14.24) ^{y}
PLM (n=22)	121.73 (101.99-211.83) ^{y}	214.42 (144.82-255.03) ^{z}	216.62 (113.98-419.11) ^{z}	102.96 (10.31-165.05) ^{z}	4.79 (3.55-15.45) ^{z}	4.43 (1.35-7.77) ^{x}
p	<0.001	<0.001	<0.001	<0.001	<0.001	0.002



Groups	Day 0	Day 3	Day 7	Day 10	Day 14	Day 21
Control (n=22)	15.46 (2.63-30.56) ^{x}	15.46 (2.63-30.56) ^{x}	15.46 (2.63-30.56) ^{x}	15.46 (2.63-30.56) ^{x}	15.46 (2.63-30.56) ^{x}	15.46 (2.63-30.56)
HFAg (n=21)	812.16 (511.87-885.95) ^{y}	550.52 (420.85-821.62) ^{y}	335.51 (211.63-553.75) ^{y}	234.43 (135.51-380.78) ^{y}	141.4 (95.51-191.63) ^{y}	15.41 (5.63-47.65)
PLM (n=22)	811.5 (511.87-885.95) ^{y}	595.55 (495.99-881.62) ^{y}	344.97 (276.73-563.75) ^{y}	132.92 (85.51-183.12) ^{z}	15.46 (5.63-42.85) ^{x}	16.75 (5.63-26.68)
p	<0.001	<0.001	<0.001	<0.001	<0.001	0.937



Groups	Day 0	Day 3	Day 7	Day 10	Day 14	Day 21
Control (n=22)	37.26 (23.67-74.6) ^{x}	37.26 (23.67-74.6) ^{x}	37.26 (23.67-74.6) ^{x}	37.26 (23.7-74.6) ^{x}	37.26 (23.7-74.6) ^{x}	37.26 (23.7-74.6) ^{x}
HFAg (n=21)	198.74 (66.1-1006,8) ^{y}	325.24 (194.9-565,2) ^{y}	333.04 (234.2-563,3) ^{y}	354.24 (233.8-1404,5) ^{y}	333.48 (223.4-854,4) ^{y}	153.86 (73.7-364,5) ^{y}
PLM (n=22)	235.86 (114.7-756,1) ^{y}	535.24 (255.1-756,9) ^{z}	1434.43 (753.1-2895) ^{z}	1438.49 (755-2535,2) ^{z}	803.83 (356.7-1424,5) ^{z}	455.92 (224.1-1023) ^{z}
p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

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PLM → degradation → Lactates → ↑Collagen and TGF-β synthesis (Fibroblasts and keratinocytes) → Faster healing, Lesser scar

↓ IL -6 and TNF-α secretion

Lactates → acidifies tissue → Faster healing, Lesser scar

Abbreviations:.
HFAg: Hydrofiber with silver
PLM: Polylactic membrane