

# REVIVING AN ANCIENT WOUND TREATMENT

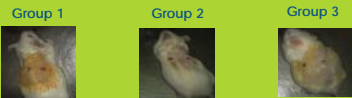
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**AIM:**  
Sugar accelerates wound healing in experimental wounds.

**BACKGROUND:**  
Use of sugar in wounds dates from ancient times, but has not found a place in modern wound management. Based on our clinical observations we conducted this experiment to validate the role of sugar in wound healing.

- Methods:**
- Swiss Webster retired breeder mice n=36; divided in 3 groups n = 12; each group n=3 sacrificed on day 3, 6,9,11 for sub group analyses (Data pending)
  - Two full thickness circular wounds per animal were created

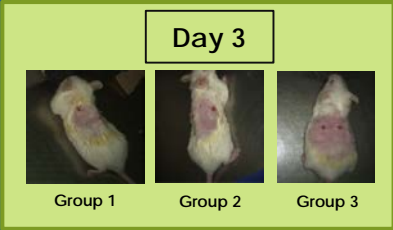


- Wounds were photographed daily with laser camera which calculates 3 dimensional wound area. Mice were anesthetized for wounding, dressing and photography.

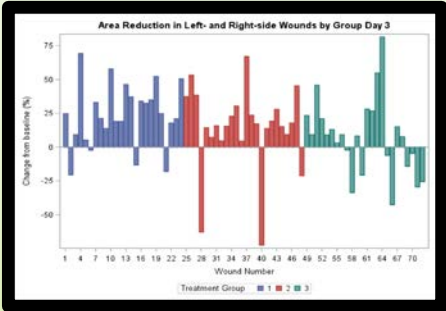


laser camera pictured above

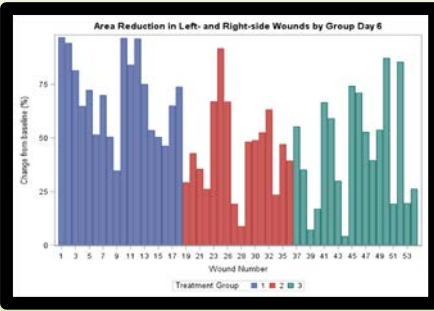
The animals were treated daily with  
Group 1: Granulated sugar plus hydrogel 1:1 ratio (Experimental Group 1)  
Group 2: Hydrogel only (Control Group)  
Group 3: Granulated sugar plus hydrogel plus betadine 1:1:0.17 ratio (Experimental Group 2) – This group with betadine was added based on our clinical observations and available literature



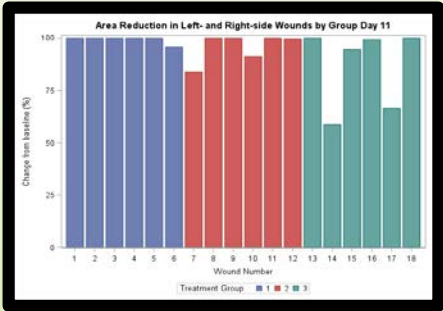
## RESULTS: Wound area reduction (in percentage) was reported for three groups:



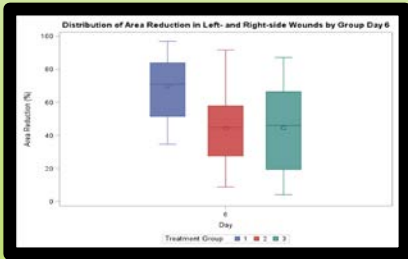
Waterfall Plot: Left- and right-side wounds 1 - 24 are from animals in Group 1 (granulated sugar + hydrogel; n=12) on Day 3; Left- and right-side wounds 25 - 48 are from Group 2 (hydrogel only; n=12) on Day 3; left- and right-side wounds 49 - 72 are from animals Group 3 (granulated sugar +hydrogel + betadine; n=12) on Day 3. It can be seen that most of reduction in area (change from baseline) in Group 1 was much larger than that reported in wounds from Group 2. Further, there was sparse positive area reduction in Group 3.



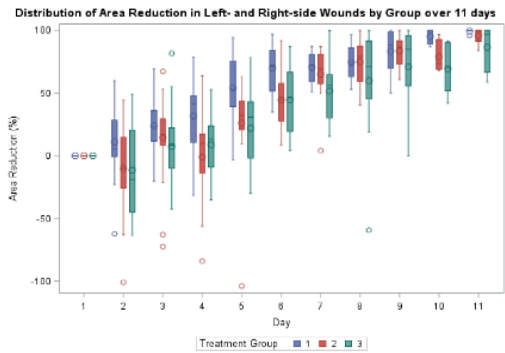
Waterfall Plot: Left- and right-side wounds 1 - 18 are from animals in Group 1 (granulated sugar + hydrogel; n=9) on Day 6; Left- and right-side wounds 19 - 36 are from Group 2 (hydrogel only; n=9) on Day 6; left- and right-side wounds 37 - 54 are from animals Group 3 (granulated sugar +hydrogel + betadine; n=9) on Day 6. It can be seen that most of reduction in area (change from baseline) in Group 1 was much larger than that reported in wounds from Group 2. Further, there was sparse positive area reduction in Group 3.



Waterfall Plot: Left- and right-side wounds 1 - 6 are from animals in Group 1 (granulated sugar + hydrogel; n=3) on Day 11; Left- and right-side wounds 7 - 12 are from Group 2 (hydrogel only; n=3) on Day 11; left- and right-side wounds 13 - 18 are from animals Group 3 (granulated sugar +hydrogel + betadine; n=3) on Day 11. It can be seen that most of the wounds in Group 1 (5/6) had healed by Day 11, with 100% area reduction; 4/6 wounds from Group 2 achieved 100% area reduction by Day 11. Only 3/6 wounds from Group 3 achieved 100% area reduction by Day 11, with 2 of the wounds still at less than 70% area reduction



Boxplots of Area Reduction (%) in left- and right-side wounds from animals in Group 1 (granulated sugar + hydrogel; n=9); Group 2 (hydrogel only; n=9); and Group 3 (granulated sugar +hydrogel + betadine; n=9) were significantly different (Wilcoxon P-value=0.0147).



Comparison Boxplots of Area Reduction of left- and right-side wounds from animals in Group 1 (granulated sugar + hydrogel; n=12), Group 2 (hydrogel only; n=12) and Group 3 (granulated sugar +hydrogel + betadine; n=12) during an 11 day follow with 3 mice sacrificed in each group on days 3, 6, and 9 post-wounding before the end-of study evaluation on Day 11. It is seen from the plot that by Day 2, wounds treated with granulated sugar +hydrogel (Group 1) achieved faster area reduction than wounds in the other two groups. This trend persisted until Day 7, when wounds treated with hydrogel only achieved area reduction that was not different from Group 1 but significantly higher than those in Group 3.  
Day 1: P=1.000; Day 2 P=0.0284; Day 3: P=0.0343; Day 4:P=0.0653; Day 5: P=0.0035; Day 6: P= 0.0147; Day 7: P= 0.0804; Day 8:P=0.9004; Day 9: P=0.7756; Day 10: P=0.0290; Day 11: P=0.1720

**CONCLUSION:** This study demonstrates increased healing rate with topical sugar compared to other groups with greater difference between sugar and sugar betadine groups as compared to sugar and hydrogel groups

References:  
1.Knutson, Richard A., et al. "Use of sugar and povidone-iodine to enhance wound healing: five years' experience." South Med J 1981.  
2.Biswas, Atanu, et al. "Use of sugar on the healing of diabetic ulcers: A review." J Diabetes Sci Technol 2010