

A Double-blind Placebo-controlled Trial of Arnica montana and Ledum palustre for the Reduction of Ecchymosis

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ABSTRACT

Background: Previous studies of Arnica montana are inadequate due to incorrect indications or exceptional under-dosage. **Objective:** This study is designed to evaluate the efficacy of OcuMend containing 50M Arnica montana and Ledum palustre on ecchymosis due to acute trauma. **Design:** A double-blind, placebo-controlled trial was conducted. **Setting:** The study was conducted at a physician's office. **Participants:** A healthy female subject with no remarkable medical history including hematologic disorders. **Measurements:** Eighteen bruises were mechanically induced to evaluate the efficacy of 12 OcuMend pads and 6 identical inactive placebo hydrogel pads. The OcuMend and placebo were tested on the same healthy subject over a two-year period. Photographs were taken of the site for up to 14 days. Two blinded physicians rated the worst bruise from the OcuMend and placebo hydrogel pads on a scale of 0-10, with 10 being the maximum bruise and 0 being no bruise (Figures 2 and 3). The average value of the two physicians' ratings was used as the final bruise rating. **Results:** The mean bruise rating for OcuMend was 0.84 with a standard deviation of 0.57. The mean bruise rating for the placebo was 6.91 with a standard deviation of 2.53. Comparing these two populations using a two-tailed t-test resulted in a p-value of 0.0000005. **Conclusion:** These results indicate with a very strong statistical significance that OcuMend, containing 50M Arnica montana and Ledum palustre, reduced bruising.

Keywords: bruising; ecchymosis; reducing bruising; reduced ecchymosis; Arnica; Arnica montana; Ledum; Ledum palustre; OcuMend

SUMMARY

In a double-blind comparison of OcuMend® (Cearna Aesthetics, San Diego, CA) and an identical placebo hydrogel, 18 bruises were mechanically induced and evaluated for severity on a scale of 0-10, with 10 being the worst-case bruise. The active ingredients in OcuMend are 50M Arnica montana and Ledum palustre. A statistically significant ($P=0.0000005$) reduction in bruising was observed for OcuMend in comparison to the placebo. The mean rating for OcuMend was 0.84 with a standard deviation of 0.57 while the mean rating for the placebo was 6.91 with a standard deviation of 2.53 (Table 1).

INTRODUCTION

Arnica can be extracted from several plant species belonging to the Asteraceae family including the most popular, Arnica montana. The most active components of Arnica are helenalin and other sesquiterpene lactones such as 11a,13-dihydrohelenalin and chamissonolid which inhibit DNA binding activity of nuclear factor kappa B (NF- κ B) [1]. Lyss et al. demonstrated that helenalin inhibits the transcriptional factor NF- κ B through the modification of the NF- κ B/inhibitor of kappa B (IkappaB) complex thereby nullifying kappa B-driven gene expression [1]. In addition, helenalin has been shown to inhibit human neutrophil migration chemotaxis, decrease cyclin B1 and cyclin A, and reduce the expression of cell surface receptors CD25, CD28,

CD27 and CD102b, which play a key role in NF- κ B activation [2].

The ability of Arnica to inhibit activation of transcription factors NF- κ B, nuclear factors of activated T cells, and pro-inflammatory cytokines IL-1b and TNF- α has been shown to correlate to the quantity of sesquiterpene lactones [2,3]. In murine macrophage cells challenged with lipopolysaccharide, Arnica prevented nuclear translocation of NF- κ B, demonstrated a 4.5-fold inhibition of nitric oxide production, and a 3-fold reduction in TNF- α levels [4].

Europeans and North Americans have used Arnica for centuries to treat inflammation, pain, sprains, bruises and wounds [5]. Homeopathic Arnica has been widely used to prevent bruising in plastic surgery with studies indicating a statically significant reduction in bruising [6].

STUDY DESIGN & METHODS

Eighteen bruises were mechanically induced to evaluate the efficacy of 12 OcuMend pads and 6 identical inactive placebo hydrogel pads. OcuMend's proprietary technology suspends active ingredients 50M Arnica and Ledum in a hydrogel.

The OcuMend and placebo pads were tested on the same healthy subject over a 2-year period. The OcuMend and placebo pads were randomized by the manufacturer and

evaluated blind to both the subject and the administrator of the bruise. The treatment for both the placebo and OcuMend included an application of a 4-by-4-inch pad for one hour. After removing the pad, a 3-pound, 2.08-foot long bar with a .875-inch diameter was dropped 20 inches down a tube onto the subject's hip. The hydrogel pad was then replaced and covered with tegaderm or an equivalent for 15 hours. Photographs were taken of the site for up to 14 days.

Two blinded physicians rated the worst bruise observed in the 14-day period from the OcuMend and placebo hydrogel pads on a scale of 0-10, with 10 being the maximum bruise and 0 being no bruise. To increase consistency, a bruising scale from 0-10 was established using the reference photos shown in Figure 1. Each reference photo was printed in a 56mm x 46mm size using an Epson Style Pro 3880 professional photo printer, attached to a large poster board and labeled with a bruise rating. The photos to be evaluated (Figures 2 and 3) were also printed in a 56mm x 46mm size using the Epson 3880 and labeled with randomly assigned numbers. The physicians were asked to rate each photo according to the bruise scale with a purple bruise being defined as a 5 or above.

RESULTS

The results of each rating are presented in Table 1 with 10 and 0 representing the maximum bruise and no bruise, respectively. The mean rating for OcuMend was 0.84 with a standard deviation of 0.57. The mean rating for the placebo was 6.91 with a standard deviation of 2.53. Comparing these two populations using a two-tailed t-test resulted in a p-value of 0.0000005. These results indicate with a very strong statistical significance that OcuMend, containing 50M Arnica montana and Ledum palustre, reduced bruising.

DISCUSSION

Arnica and Ledum are herbs that are frequently used by physicians and homeopaths. Arnica comes in several formulations including extract (tincture), creams, ointments and gels containing 20-25% arnica tincture of 15% arnica oil. Oral dosage forms are available as capsules, tablets and pellets. Topical arnica is used to treat inflammation and pain due to bruises, aches, postsurgical bruising and swelling, and sprains [5]. Oral arnica is used to treat postsurgical bruising and swelling, mouth and throat inflammation, and as an abortifacient.

Our study had several limitations. The physicians recruited for the study used a visual analogue scale to grade the severity of bruises which is a subjective measure. The composition of skin and underlying structures throughout the body react differently to trauma.

CONCLUSION

The formulation of Arnica montana and Ledum palustre in OcuMend reduces the severity of bruising. It is a viable treatment in the management of post-procedure skin care following dermatologic and oculo-facial surgeries. Further studies are needed to validate the effectiveness of Arnica and Ledum using larger sample sizes and standardized and validated methods to measure ecchymosis.

REFERENCES

1. Lyss G, Schmidt TJ, Merfort I, Pahl HL. Helenalin, an anti-inflammatory sesquiterpene lactone from Arnica, selectively inhibits transcription factor NF- κ B. *Bio Chem* 1997;378(9):951-61.
2. Abstract: Berges C, Fuchs D, Opelz G, Daniel V, Naujokat C. Helenalin suppresses essential immune functions of activated CD4+ T cells by multiple mechanisms. *Mol Immunol*. 2009 Sep;46(15):2892-901. doi: 10.1016/j.molimm.2009.07.004. Epub 2009 Aug 5.
3. Ekenas C, Zebrowska A, Schuler B, et al. Screening for anti-inflammatory activity of 12 Arnica (Asteraceae) species assessed by inhibition of NF- κ B and release of human neutrophil elastase. *Planta Med* 2008;74(15):1789-94.
4. Verma N, Tripathi SK, Sahu D, Das HR, Das RH. Evaluation of inhibitory activities of plant extracts on production of LPS-stimulated pro-inflammatory mediators in J774 murine macrophages. *Mol Cell Biochem*. 2010 Mar;336(1-2):127-35. doi: 10.1007/s11010-009-0263-6. Epub 2009 Oct 8.
5. Kouzi SA, Nuzum DS. Arnica for bruising and swelling. *Am J Health Syst Pharm*. 2007 Dec 1;64(23):2434-43. Review. PubMed PMID: 18029949.
6. Lee HS, Yoon HY, Kim IH, Hwang SH. The effectiveness of postoperative intervention in patients after rhinoplasty: a meta-analysis. *Eur Arch Otorhinolaryngol*. 2017 Jul;274(7):2685-2694. doi: 10.1007/s00405-017-4535-6. Epub 2017 Mar 17. Review. PubMed PMID: 28314960.

Figure 1. "Reference bruising photos"

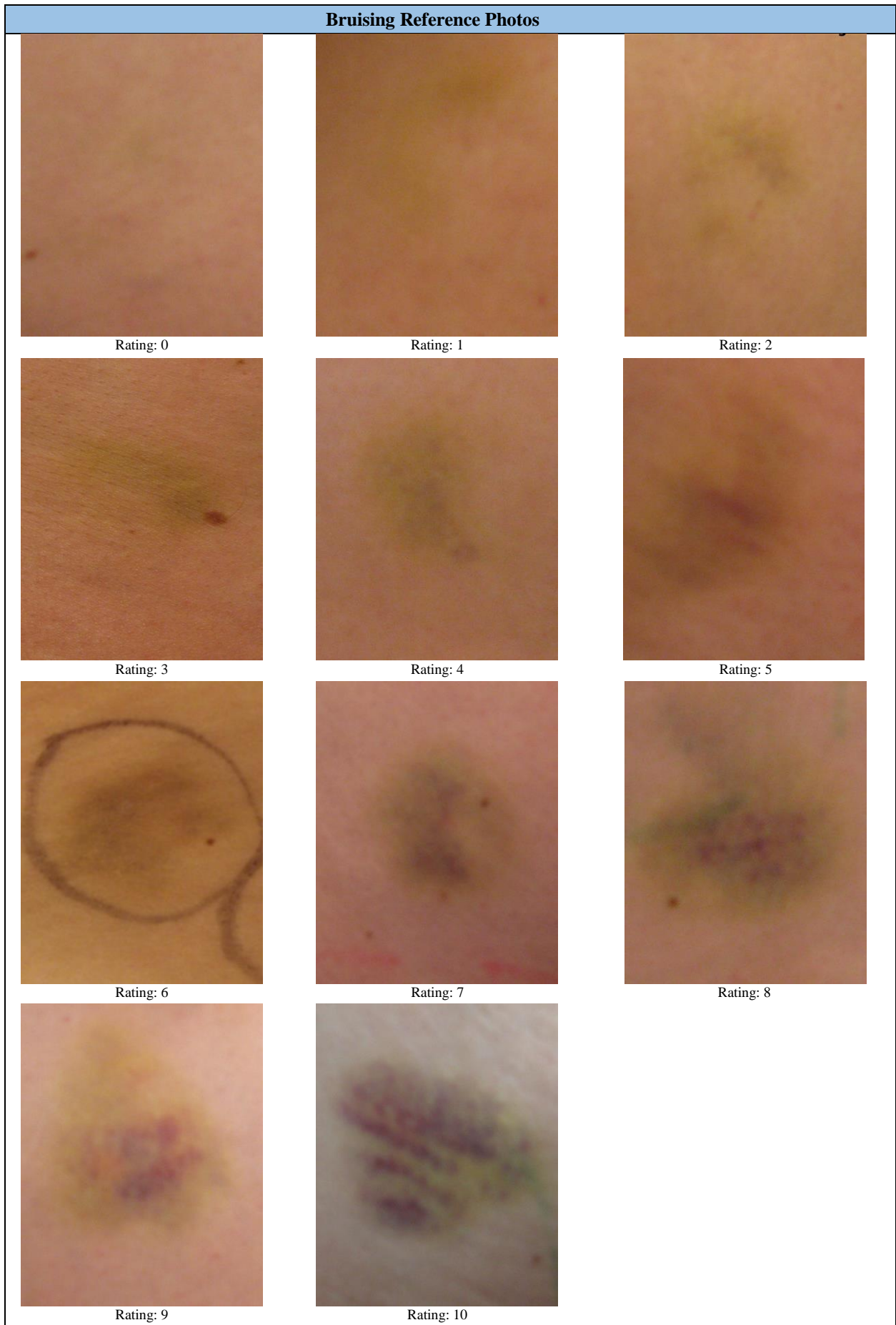


Figure 2. "Placebo treated bruises"

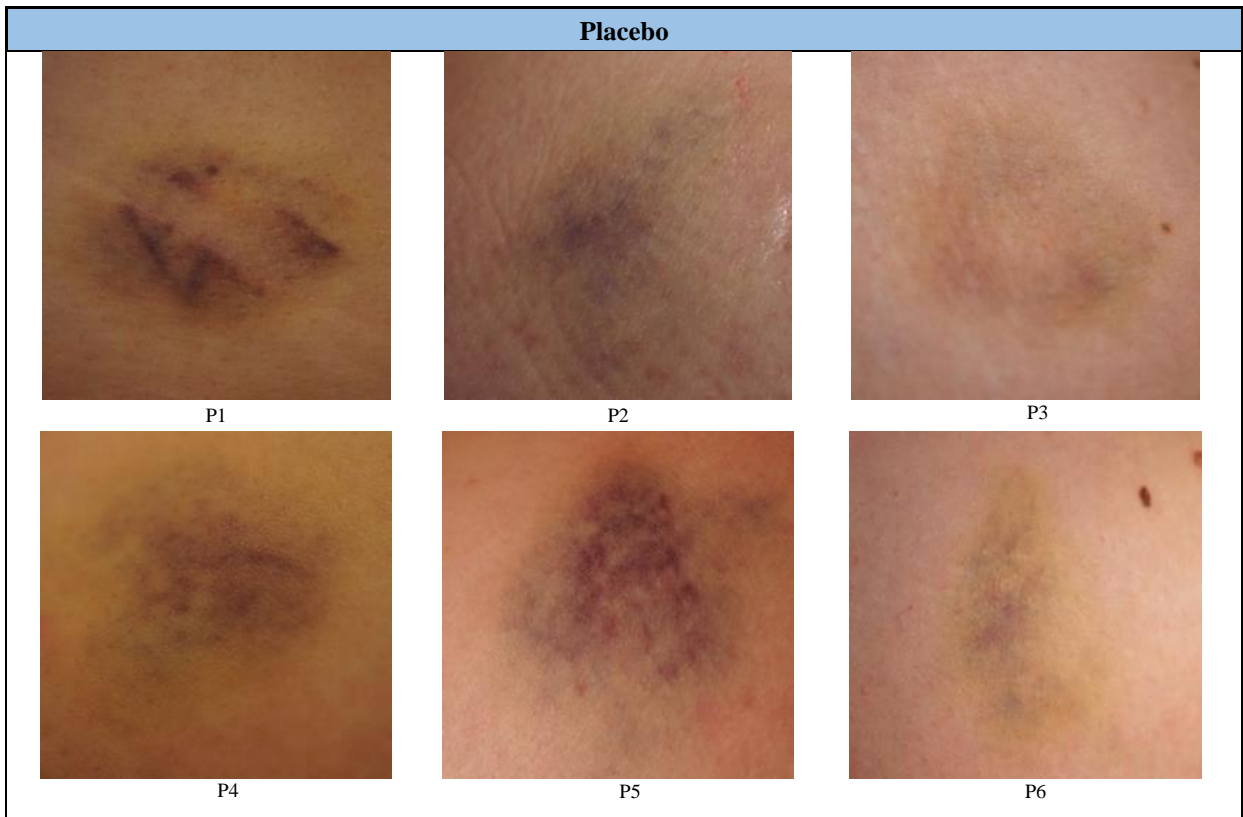


Figure 3. "OcuMend treated bruises"



Table Legend

Table 1. "Study results"

Placebo		OcuMend			
Sample	Rating	Sample	Rating	Sample	Rating
P1	9	A1	1.5	A7	1
P2	8	A2	0	A8	0.5
P3	3	A3	0.5	A9	2
P4	8	A4	1	A10	1
P5	9	A5	1	A11	0
P6	4.5	A6	1	A12	0.5
Mean	6.91	0.84			
Standard Deviation	2.53	0.57			
P-Value		0.000005			