

LETTERS TO THE EDITOR

Dear Editor,

Moisturizing and cosmetic properties of emu oil: A pilot double blind study

The emu, a large, flightless bird, *Dromaius nova hollandiae*, is probably best known for being on Australia's coat-of-arms opposite the kangaroo. In the past few years, commercial emu breeding has become a multi-billion dollar industry in the United States, Australia, and other countries. Emu oil derived from emu fat was being used by the Aborigines for healing and pain control long before British ships landed on the eastern shores of Australia. A number of Australian investigators (George Hobday, MD, a dermatologist and Peter Ghosh, PhD, FRSC at the University of Sydney) claimed that emu oil has anti-inflammatory and skin penetrating properties. Furthermore, recently the Australian Department of Health classified emu oil as a pharmaceutical product¹ and registered emu oil in the Therapeutic Goods Registry.^{1,2} Unfortunately we performed an extensive literature search (Medline, Index Medicus) and could not find a single report in a scientific peer reviewed literature dealing with either emu oil and its cosmetic pharmaceutical properties or its composition. The present, a pilot double blind, study was conducted to survey patient satisfaction with moisturizing and cosmetic properties of emu oil. The emu oil was compared in this study to mineral oil, a synthetic oil that is widely used in the United States as an emulsifier and lubricant in topical cosmetic and pharmaceutical preparations.

METHODS

Human subjects

Eleven subjects, residing in the state of Texas, were recruited and completed the study (nine women and two men). Mean age was 35 years (age range 25–52, median age 34). Ten subjects were Caucasian and one subject was Hispanic. All had Fitzpatrick skin type 2 or 3 based on history of response to UV radiation. All had healthy skin, and people with eczema and acne were specifically excluded from this study. Since both emu and mineral oil can be purchased in the United States over the counter, no human subject research permit was required or issued by the Texas Tech University Human Subject Institutional Review Board.

Oil

Emu oil for clinical study was imported from Australia (Emu Vertica, Thalgo Holdings Pty. Ltd). Both Australian emu and mineral oil were placed in dark, numbered bottles by a pharmacist (Caprock Drugs, Lubbock, TX). Neither human subjects or principal investigator knew which oil each subject was using at what particular time. The code was not broken until all volunteers completed the study and returned the questionnaire to the principal investigators.

Protocol

Prior to entering the study, each subject was examined by a university-based dermatologist to make sure that none of the volunteers had eczema or acne. The volunteers were instructed to use the first oil on their face and trunk twice a day for 2 weeks. The human subjects were told to discontinue use of any other lubricants. After 2 weeks of oil use the human subjects were briefly examined by the principal investigators for signs of skin irritation or acne, and at that time were given a second oil. The pharmacist made sure that each subject received both emu and mineral oil. At the end of the study, each subject completed the questionnaire (Figure 1) and ranked on a 0–5 scale (5, excellent; 0, poor) how much they liked each oil. They were also asked which one they liked better and to rank its penetration/permeability, moisturizing properties, texture, and any side effects (comedogenicity, odour, irritancy, etc.).

Statistical analysis

The data generated was in a created ranking scale format (0, poor; 5, excellent), and was analysed by a biostatistician utilizing the Wilcoxon Signed Rank test.

RESULTS

As shown in Table 1, the emu oil overall ranking and permeability appeared to be superior to mineral oil. These differences in skin penetration/permeability and overall ranking were statistically significant ($P < 0.05$). It also appears that emu oil texture and moisturizing properties, as judged by the participants in the study, were also superior to mineral oil, but the differences cannot be considered statistically significant ($P > 0.05$). However, because the sample size in this study was

Table 1 The oils' ranking by the participants of the study

| | Emu oil | | Mineral oil | | P | Statistically significant difference |
|-------------------------------|---------|-------|-------------|-------|-------|--------------------------------------|
| | Median | Range | Median | Range | | |
| Overall ranking | 5.000 | (3–5) | 3.000 | (2–4) | 0.020 | Yes |
| Oil texture | 4.000 | (2–5) | 3.000 | (2–5) | 0.540 | No |
| Skin permeability/penetration | 5.000 | (1–5) | 3.000 | (1–5) | 0.016 | Yes |
| Moisturizing properties | 5.000 | (1–5) | 4.000 | (1–5) | 0.062 | No |

Volunteer Form

Patient Initials: _____ Age _____ Sex _____

Oil Code # _____

Overall Grade oil from 0 (poor) to 5 (excellent) _____

Grade Texture (0-5) _____

Skin permeability (0-5) _____

Moisturizing properties (0-5) _____

Was this oil: (mark all that applied)

- irritant
 pimple producing
 bad odor
 other

Oil Code # _____

Overall Grade oil from 0 (poor) to 5 (excellent) _____

Grade Texture (0-5) _____

Skin permeability (0-5) _____

Moisturizing properties (0-5) _____

Was this oil: (mark all that applied)

- irritant
 pimple producing
 bad odor
 other

Which oil did you like better? _____

Why did you like it better? _____

Thank you for your participation.

Figure 1 The questionnaire that volunteers were asked to complete at the end of the study.

Table 2 Oil preference and side effects, ranked by the participants of the study

| | Emu oil | Mineral oil |
|----------------|-----------|-------------|
| Oil preference | 11 (100%) | 0 (0%) |
| Comedogenicity | 2 (18%) | 6 (55%) |
| Irritancy | 0 (0%) | 0 (0%) |

small ($n = 11$) no definite conclusion can be derived from this pilot study.

When the participants in this study were asked which of the two oils they liked better, all 11 subjects (100%) stated that they liked emu oil better (Table 2). Neither emu oil nor mineral oil was found to be irritating to the skin (0%, Table 2). Finally, when the oils were applied to the face, six people (55%) and two people (18%) reported the mineral and emu oil, respectively, caused pimples (Table 2).

DISCUSSION

This pilot double blind crossover study seems to indicate that emu oil may find application in cosmetic and pharmaceutical industries. We found emu oil to be totally non-irritating, having good moisturizing properties, cosmetically pleasing texture, and low incidence of comedogenicity. The most intriguing property of emu oil, as far as cosmetic and pharmaceutical industries are concerned, is its proposed ability to penetrate the stratum corneum barrier. The study of penetration of various substances through the skin is an area of an active research and is obviously important from therapeutical and toxicological viewpoints. Iontophoresis³ and liposome preparations^{4,5} are actively studied as a means to increase cutaneous bioavailability. Since most topical vehicles have an absorption rate of only a few per cent,⁶ the drugs and other active ingredients combined with more efficient drug-carrier systems are of major interest to cosmetic and pharmaceutical industries. A liposome preparation containing the antifungal agent econazole (econazole 1%; Pevaryl; Cilag-Chemie, Schaffhausen, Switzerland) and cosmetics with a liposome base are now available in the United States and Western Europe.^{4,5} Unfortunately, because of high cost and other technical problems, neither liposome nor iontophoresis is now widely used in either cosmetic or dermatological topical preparations.³⁻⁵ If, indeed, emu oil has skin penetrating properties, and because of its relatively low cost, this oil should be of major interest to dermatologists and cosmetic scientists as a transcutaneous carrier system. It would not be unreasonable to try to combine emu oil with topical antifungals, steroids, retinoids, anti-histamines, anaesthetics, anti-androgen and immunosuppressive drugs to see if emu oil improves cutaneous bioavailability.

This is, to the best of our knowledge, the first scientifically conducted study addressing cosmetic and pharmaceutical properties of emu oil. We hope that future studies will help fully elucidate cosmetic, moisturizing and pharmaceutical properties of this oil.

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Dear Editor,

Generalized eczéma craquelé: A sign of internal malignancy

Eczéma craquelé, or asteatotic eczema, is not an uncommon condition, especially on the lower legs of elderly, hospitalized patients. The skin is dry, with irregular fissuring and inflammation in a reticulate pattern. Aetiological factors include low humidity, excessive washing and the decreased resilience of aged skin. There is usually a very good response to withdrawal of contributing factors and treatment with emollients and topical steroids.

In contrast, generalized eczéma craquelé is a rare disorder which has been associated with internal malignancies, including gastric adenocarcinoma, Hodgkin's lymphoma, breast carcinoma and angioblastic lymphadenopathy, as well as with benign disorders, including hypothyroidism, zinc deficiency and intestinal amoebiasis. Thus, its appearance should alert the clinician to the possibility of an underlying malignancy. We report the case of a man who had generalized eczéma craquelé who was initially thought to have coeliac disease but was subsequently found to have malignancy of the lower biliary tract.

An 82-year-old man had a 7-week history of skin irritation followed by the development of anorexia, diarrhoea, and weight loss of 12 kg. Topical therapy with 1% hydrocortisone cream and 10% glycerine in sorbolene had been ineffective.

Examination revealed a cachexic, elderly man with generalized eczéma craquelé affecting nearly his entire body surface, sparing only the face, scalp and palmo-plantar surfaces. The legs were most severely affected and the trunk least so. Treatment with 10% glycerine in sorbolene three times daily produced some improvement in his eczéma craquelé.

Endoscopy of upper and lower gastrointestinal tracts was performed. A duodenal biopsy revealed severe crypt hyperplasia and villous atrophy, and a diagnosis of coeliac disease was made. However, the response to a gluten-free diet with iron and folate supplementation was poor. Subsequent abdominal imaging with a computed tomography (CT) scan revealed dilated biliary ducts above the head of the pancreas, but no mass in either the pancreas or the biliary duct could be visualized. His condition deteriorated to the extent that the presumed diagnosis of carcinoma of either the pancreatic head or the ampulla of Vater could not be confirmed by endoscopic

retrograde cholangiopancreatography. He died shortly thereafter and an autopsy was not performed.

This case illustrates the importance of searching for an underlying malignancy in generalized eczéma craquelé. The pathogenesis of this cutaneous sign of internal malignancy is unclear, although the biopsy showing intestinal atrophy in our case lends support to the hypothesis that malabsorption is involved. Interestingly, one patient in a previous report of generalized eczéma craquelé in association with Hodgkin's disease had suffered from coeliac disease for the preceding 12 years.² Zinc supplementation has produced improvement in some cases of generalized eczéma craquelé and may be worth a therapeutic trial in this disorder.¹

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Dear Editor,

Critical analysis and systematic reviews: Should they be part of the training program?

Systematic review articles which fulfil specific criteria are valuable tools for busy practising clinicians who are faced with an ever-increasing volume of information from primary research. The task of undertaking such a review is large.

By specifically including training in critical review, our trainees and future graduates will not only have the skills to contribute to such reviews but will be able to apply these criteria to designing prospective trials.

Systematic reviews are distinguished from other types of reviews by the rigour of the methods used to ensure that the results of the review are as close to 'the truth' as possible. They follow methods which are explicitly defined by the authors, follow a standard format for data collection, critical appraisal and analysis, and are regularly updated by the authors.

Systematic reviews, by combining greater numbers from standardized sources, have more power to detect the effects of therapeutic interventions, if they are present. However, when using data analysis, it is important to understand the potential problems with pooling data. If data is pooled appropriately, it will increase the power of the review and give a more precise estimate of the measure of the effect. However, it is important not to pool data from poor-quality studies or from studies which are not sufficiently similar.