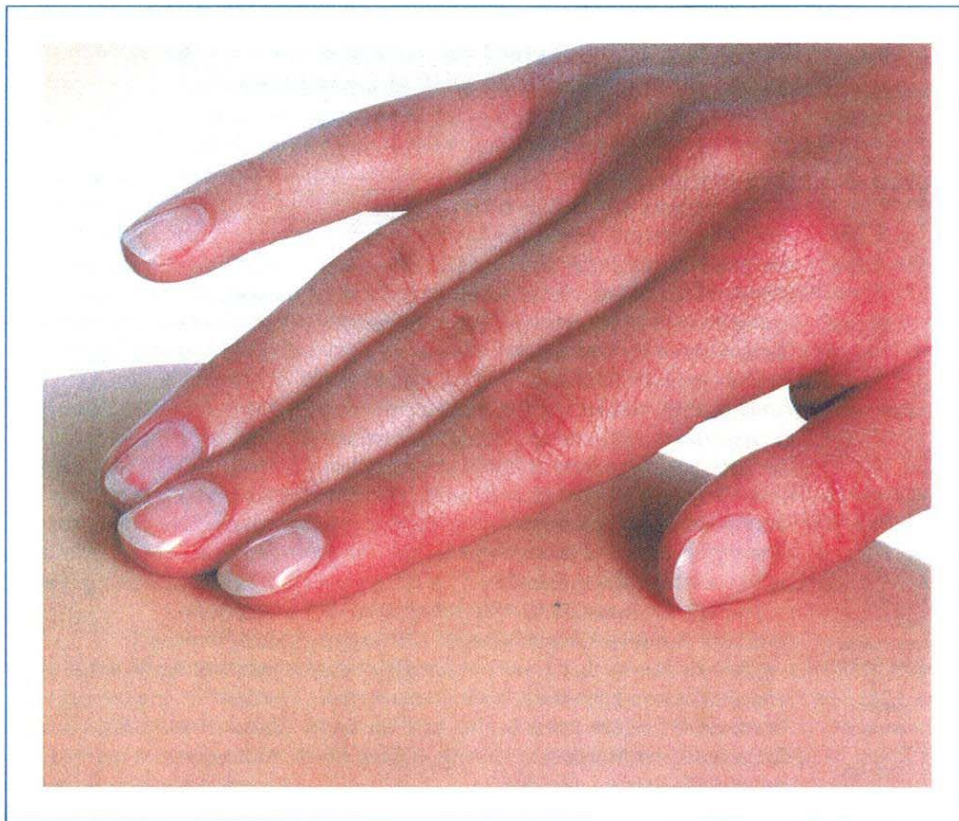


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An evaluation of hyper-oxygenated fatty acid esters* in pressure sore management



***Sanyrène®** : URGO Healthcare Products

An evaluation of hyper-oxygenated fatty acid esters in pressure sore management

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The aim of this study was to use transcutaneous oxygen pressure (tcpO₂) measurements to evaluate the efficacy of a solution containing hyper-oxygenated fatty acid esters in the prevention of pressure sores in 28 patients at high risk of developing sores.

Statistical analysis indicates a significant difference between tcpO₂ values during pressure exertion before and after application of the product ($p = 0.014$). Oxygen pressure values decreased significantly when the patient applied pressure to the sacral area before the test product was applied whereas no difference in oxygen pressure values was noted after application of the test product.

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Measures designed to prevent pressure sores are well known but not always scientifically

Hyper-oxygenated fatty acids; Massage; Pressure sores

gave written informed consent and participated in the study.

evaluated. This study used measurements of tcpO₂ to evaluate the efficacy of massage, using a solution containing hyper-oxygenated fatty acid esters (Sanyrene).

The product is a solution of hyper-oxygenated fatty acid esters, containing a mixture of glycerides composed of glycerol tri-esterified by fatty acids at different levels of saturation, including, principally, linoleic acid. The slow and controlled oxidation splits the double bonds in the fatty acids and inserts oxygenated substances into the molecule.

The use of massage in the prevention of pressure sores is controversial¹. A recent study² has shown that surface massage is beneficial but deep kneading can be detrimental. It would therefore seem useful to maintain this preventive technique so long as deep tissue movements are avoided.

Measurement of tcpO₂ is a technique that assesses the efficacy of treatment in ischaemic pathologies³⁻⁵. Its application in the evaluation of pressure sores prevention is more recent⁶⁻¹⁰. We have used this technique previously to validate patient positioning for pressure sore prevention¹¹ and to test preventive materials¹².

Method

This was an open comparative study. Twenty-eight volunteers (11 men and 17 women)

All the patients were at risk of developing pressure sores, established by means of the Norton scale¹³. Mean patient age was 60 years. Sacral tcpO₂ was measured before and after application of the product.

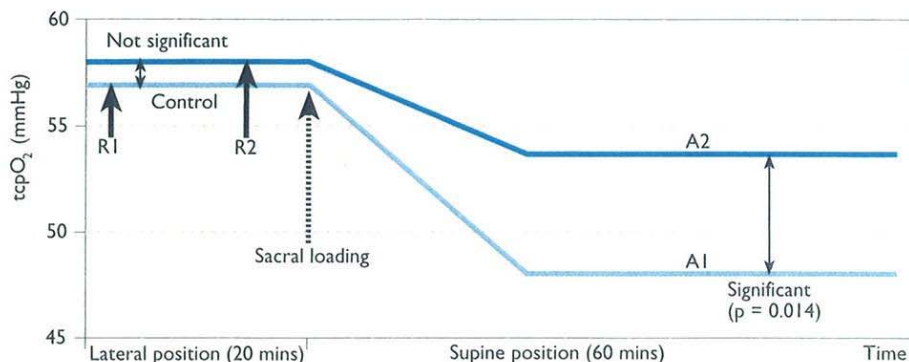
Measurements were taken using a monitor (Microgas 7640, Kontron Instruments) which provides a direct reading of tcpO₂ expressed as mmHg. The monitor was connected to a chart recorder to obtain a continuous tcpO₂ tracing. The probe was a Clark polarographic electrode fixed to the most appropriate area of the sacrum using double-sided adhesive.

Study protocol

A resting tcpO₂ value was measured with the patient in the laterally inclined position for about 20 minutes. The precise site of the electrode was then marked. The patient moved to a supine position on a foam mattress and the tcpO₂ value was measured for one hour. The electrode was removed and three drops of the test product applied on the sacral site; the skin was gently massaged for one minute until the product appeared to be fully absorbed. TcpO₂ measurements were repeated with the patient in the lateral position for 20 minutes to establish stable values and in the supine position for one hour.

The following tcpO₂ values were recorded:
■ The mean of the last three tcpO₂ resting

Fig 1. The increase in tcpO₂ values observed after the application of the product



values (lateral position) before application of the product (R1)

■ Mean values during pressure exertion (with patient in supine position) before application of the product (A1)

■ Mean of the last three tcpO₂ resting values (lateral position) after application of the product (R2)

■ Mean values during pressure exertion (one hour) after application of the product (A2).

Mean values for R1, R2, A1 and A2 were compared using a t-test for paired differences. A p-value < 0.05 was used to indicate statistical significance.

Results

Fig 1 shows that, in most patients, the tcpO₂ values increased after application of the product, then decreased to a stable level. After preliminary analysis of the results it was decided to withdraw five patients whose tcpO₂ values were reduced to zero during the pressure exertion phase because it was considered impossible to compare two situations where the tcpO₂ value was zero. One patient was withdrawn because the curves showed artefacts, probably caused by patient movement, that rendered interpretation difficult.

Table 1 indicates the mean tcpO₂ values for the remaining 22 patients.

Statistical analysis showed the following:

■ No significant difference between tcpO₂ values measured without pressure exertion

before and after application of the test product (R1 and R2)

■ A significant difference between the tcpO₂ values measured during the pressure exertion phase before and after application of the test product (A1/A2: p = 0.014) (Fig 1)

■ The decrease in tcpO₂ values was significant during the pressure exertion phase before application of the product (R1/A1: p = 0.012) but there was no difference when the product was used (R2/A2: p = 0.104)

Discussion

The increase in tcpO₂ values did not seem to be related to any mechanical factors as the product was applied with the fingertips, taking care not to apply any excessive stress on the skin surface. The action of the product on skin microcirculation could be related to its chemical composition. A possible explanation is that there is a structural similarity between some of the product's components and arachidonic acid. The fatty acids could, by molecular substitution, act as a prostacyclin-like compound capable of inducing vasodilatation, which may explain the increase in tcpO₂ values noted after application of the product.

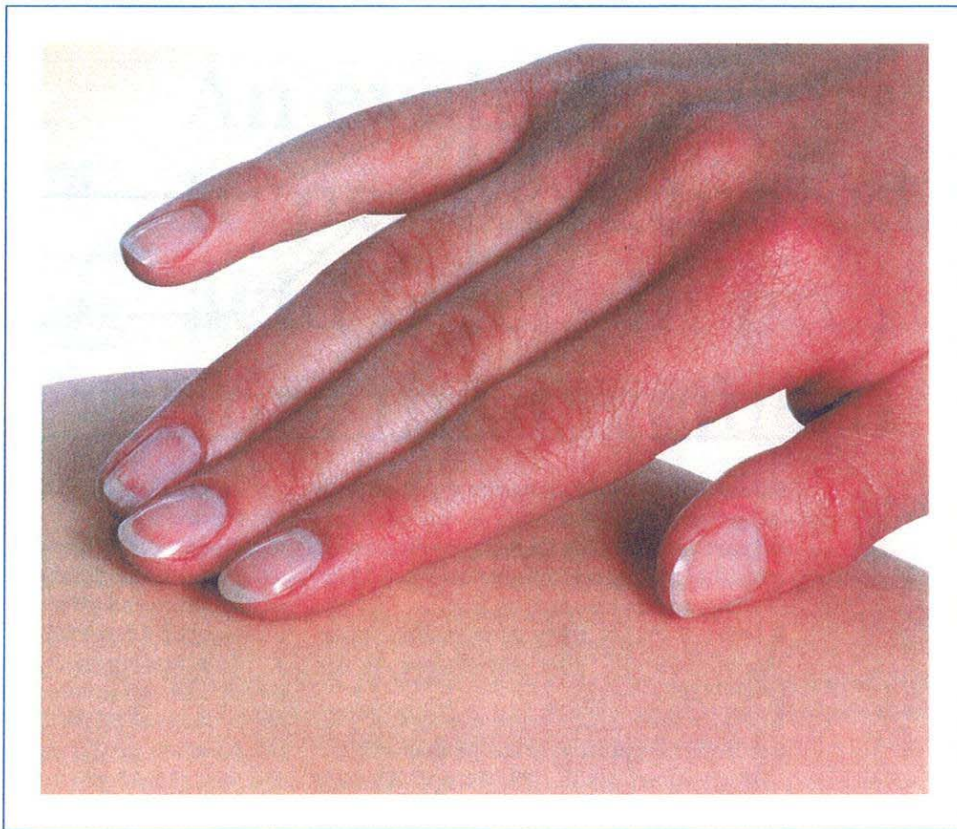
Conclusion

Objective methods must be developed that can evaluate and validate techniques or materials used in pressure sore prevention. The measurement of transcutaneous oxygen pressure is a reliable method that has been used to demonstrate the efficacy of a solution containing hyper-oxygenated fatty acid esters in patients at risk of developing pressure sores. These results should be confirmed by further studies to describe more precisely the mechanisms of action involved and the effects of the product on skin microcirculation and its role in the pressure sore prevention. ■

■ This evaluation was undertaken with financial support from Urgo Health Care Products

Table 1. Mean tcpO₂ values for 22 patients

Time of measurement	Mean tcpO ₂ (mmHg)
Before pressure exertion, before application of the product (R1)	57.2 ± 5.10
During pressure exertion, before application of the product (A1)	48 ± 5.99
Before pressure exertion, after application of the product (R2)	58.5 ± 4.35
During pressure exertion, after application of the product (A2)	53.7 ± 6.87



Sanyrène

Glycérides hyperoxygénés
d'acides gras essentiels

Hyperoxygenated fatty
acid esters

- *Massage par effleurage pendant une minute*
- *2 à 3 gouttes par localisation à risque*
- *Lors de chaque changement de position*



- *Gentle massage with the fingertips for one minute*
- *2 or 3 drops per area at risk*
- *At each patient repositioning*

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