

# HOW I USE COAL TAR IN DERMATOLOGY

L Y O Leong

## ABSTRACT

Coal tar has been used in dermatology for over a hundred years. It was the main therapeutic agent for the treatment of various skin orders before the introduction of topical steroid. Since the advent of topical steroid the use of coal tar has reduced considerably. It is still being used a lot in the treatment of psoriasis. In this paper I will describe how I use coal tar not only in psoriasis, which is well known, but also in acne, folliculitis, eczema and seborrheic dermatitis and vitiligo, which are less well known.

**Keywords :** coal tar, treatment, dermatology

SINGAPORE MED J 1990; Vol 31: 614-615

## SOURCE COMPOSITION AND PROPERTIES OF COAL TAR

Crude coal tar is obtained by the destructive distillation of bituminous coal. The chief constituents are benzene, naphthalene, phenols and pitch. Crude coal tar, when further refined, becomes prepared coal tar. It is a thick black smelly viscous liquid.

Coal tar solution is a 20% alcoholic solution of prepared coal tar. In clinical use 5 to 10 ml of the solution is added to 100 ml of calamine lotion, or 100 gm of aqueous cream, vaseline or steroid cream or ointment for treatment. This results in a lotion, cream or ointment containing 0.01% or 0.02% prepared coal tar (Table I).

**Table I**  
Concentration of prepared coal tar  
in various preparations

100%	coal tar solution	0.20%
5%	coal tar solution	0.01%
10%	coal tar solution	0.02%

Prepared coal tar is also incorporated into vaseline in 1 to 5% concentration for treatment. This is a dark green ointment that stains the garment. Some commercial shampoos (Polytar, Ionil-T) and soaps (Wright's Coal Tar, Polytar) contain coal tar as the major component.

Coal tar has anti-pruritic, antiseptic and anti-fungal effects. It also has anti hyperkeratotic properties.

## ACNE

I have often prescribed coal tar soap instead of other proprietary acne soap for washing acne affected skin. It is effective and well tolerated. There is the added advantage of overcoming and preventing pityrosporon folliculitis.

Most patients with acne tolerate traditional sulphur resorcinol acne compounds well. Some patients are irritated by it or are allergic to its ingredients. Some get red easily with benzoyl peroxide or retinoic acid compounds. For these patients calamine lotion with 5% coal tar solution and 10% glycerine is usually well tolerated and helpful. The lotion is gentle and soothing. It has antiseptic properties and is particularly suited for very inflammatory acne lesions like red papules, pustules, nodules and cysts. For mild inflammatory acne the lotion alone is sufficient to clear the spots. For more severe lesions oral antibiotics are necessary.

## FOLLICULITIS

This is a condition that looks like papular acne but with small follicular red spots (not nodules and cysts) on the face, chest and back. It often follows application or oral administration of corticosteroid for other inflammatory conditions or prolong oral antibiotic for acne. The cause is more pityrosporon ovale fungus than bacteria.

The usual medication for acne is not helpful. Calamine lotion with 5% coal tar solution applied nightly after shower with coal tar soap will usually clear it in 2-4 weeks. Additional Nizoral orally is also very helpful.

## SEBORRHEIC DERMATITIS

Seborrheic dermatitis is traditionally treated with steroid creams with sulphur or vioform. More recently the newer anti-fungal imidazoles are added to steroid creams for treatment of this condition. Even more recently there are some dermatologists who treat seborrheic dermatitis as

National Skin Centre  
1 Mandalay Road  
Singapore 1130

L Y O Leong, MB, FRCP (Edin), AM(S'pore)  
Visiting Consultant

a pure fungal infection by pityrosporon ovale using only ketoconazole shampoos. Our view on seborrheic dermatitis is that it is related to both an internal sensitive skin and an external over growth of pityrosporon ovale fungus. The treatment which I have found very helpful is a mild steroid cream or scalp lotion combined with coal tar solution.

For scalp lesions Betnovate-CTS scalp lotion is easy to make and use. It is prescribed as follows:

Betnovate Scalp Application	30ml
Glycerine	30ml
Coal tar solution	6ml
Distilled water to	120ml
Mix into scalp lotion	
Apply nightly	

For face and body lesions 5% coal tar solution is added to 1/4 strength Celestoderm cream (Betamethasone 0.025%) for application 2 to 3 times daily.

Two to 3 weeks of medication will clear mild to moderate seborrheic dermatitis. Severe lesions will take longer to resolve.

Patients stop medication when cleared of dermatitis but continue on preventive measures. Less and less rash recurs. The prevention is frequent washing of the scalp, face and upper body with tar soap or shampoo.

## PSORIASIS

Tar can be the first line treatment for most cases of psoriasis. Early psoriasis are usually mild and can be treated using aqueous cream with coal tar solution with or without salicylic acid.

Five to 10 ml of coal tar solution can be added to 100 gm of aqueous cream to make aqueous cream with 5% to 10% coal tar solution. Each 5 ml of coal tar solution can dissolve 1 gm of salicylic acid. Put more than 1 gm of salicylic acid into 5 ml of coal tar solution and some of it will not dissolve, giving rise to a sandy cream.

To make aqueous cream with 1% salicylic acid and 5% coal tar solution dissolve 1 gm of salicylic acid in 5 ml of coal tar solution, which is then added to 100 gm of aqueous cream. Double the quantity of both active ingredients and we get aqueous cream with 2% salicylic acid and 10% coal tar solution.

Acute small guttate psoriasis with mild scaling will respond very well to aqueous cream with coal tar solution.

More chronic psoriasis with thicker scales will benefit from aqueous cream with 2% salicylic acid and 10% coal tar solution. The cream is applied in the evening, left over night, and washed off the next morning with toilet soap. Tar creams stain white garments and bed sheets. Patients must be warned to avoid white and light coloured garment and linen. Six to 12 weeks of application will clear most lesions. Whatever lesions that persist will need stronger medication.

## REFERENCE

1. W J Cunliffe. The present day role of tar in dermatology.1987. A publication of Stiefel Laboratories.

For very inflammatory and itchy psoriasis on body and limbs 1/4 strength Celestoderm or Betnovate cream with 5% coal tar solution can be used with very satisfactory reduction of itching and scaling.

Persistent thick lesions that will not clear with milder tar cream may be benefited by application of 1 to 5% prepared coal tar in vaseline. This is a greenish black greasy ointment that smells and stains and therefore is not well tolerated by patients. I seldom use this except on those patients who still ask for it. Additional treatment for persistent plaques include intermittent application of dithranol or more penetrative steroid ointment.

Resolution of psoriasis with tar treatment is slow, but once cleared the lesions do not come back so soon compared to treatment with pure topical steroid application. There is no rebound phenomenon with tar treatment.

## VITILIGO

This condition is usually treated with psoralen applied topically or taken orally followed 2 hours later by exposure to sunlight or ultra violet lamp. Application of diluted steroid cream alone or in addition to psoralen and ultra violet light is also helpful for treatment of vitiligo.

I usually add 5% of coal tar solution into 1/4 strength Celestoderm cream to apply at night. The addition of tar can photosensitise the affected skin to sunlight therapy. Because vitiligo treatment is prolonged it is best to avoid stronger steroid application to avoid atrophy of the skin.

Patients are instructed to expose affected parts to mid day sunlight for 10 to 20 minutes. This is done 3 times a week. Sufficient exposure is shown by a mild erythema in the evening and the next morning. If there is no erythema, increase the exposure. If the erythema is too much, reduce exposure.

Improvement can be seen within 3-6 months. Face and body lesions usually respond well. As with other methods of treatment hands and feet lesions respond poorly.

## PROBLEMS

Coal tar solution is generally well tolerated by patients. On rare occasions a patient may complain of irritation and aggravation from the use of coal tar preparation. Some of these reactions are temporary irritant reactions especially when the lesions are very inflamed. Rarely is it due to allergy to coal tar. Repeated positive reaction to patch test with coal tar confirms diagnosis of true coal tar allergy.

There is a mistaken belief that coal tar should not mix with steroid creams or ointments. I have used 5 to 10% coal tar solution in 1/4 or 1/2 strength Celestoderm cream or Betnovate in aqueous cream, Diprocel or Betnovate ointment in vaseline for many years and can say that the combination poses no problem. I am not aware of any study that shows that mixing coal tar and steroid causes deterioration of effect of one or the other.