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Crude Coal Tar Treatment Every Day Versus Every Other Day for Plaque Psoriasis

Sir,

Coal tar has been used in the topical treatment of psoriasis for more than a century and is assumed to have keratolytic, anti-pruritic, anti-mitotic and anti-inflammatory effects (1–3). Tar has, mostly due to its smell and staining properties, to some extent been replaced by other local treatments.

Coal tar is a complex mixture of thousands of compounds produced by condensation during the carbonization of coal (1, 4); however, the active substances in coal tar have never been identified (1, 4). It is well known that exposure to UV irradiation in the days following tar treatment can result in sunburn, indicating that the effect of tar in the skin persists for > 24 h.

In Denmark, crude coal tar (CCT) is still used daily for the treatment of plaque psoriasis. The procedure is very time-consuming and is limited by the number of nurses and bathrooms available. To evaluate the procedure and perhaps observe an extended effect of the tar in the skin, we investigated the effect of treatment with CCT every other day as compared with every day.

MATERIAL AND METHODS

The trial was conducted as a prospective, investigator-blinded, right/left randomized comparison of CCT treatment every day versus every other day. The study was approved by the Ethics Committee of Copenhagen.

A total of 15 adults (six males, nine females; mean age 54 years; range 23–90 years) volunteered for the study and gave their informed consent. Patients were recruited among those referred to the Department. All patients suffered from chronic plaque psoriasis and none of them received any other treatment for their skin disease during the study. Exclusion criteria were allergy to coal tar and pregnancy. All patients were > 18 years old.

Treatment with CCT every weekday was randomly assigned to one side of the body by drawing lots. On the opposite side of the body CCT was applied every other weekday. The application of CCT was followed by 20 min in a bathtub (37°C). The patients used tar cream 5% during weekends.

The psoriasis was assessed by a second doctor who was unaware of the treatment. Psoriasis severity was assessed with respect to erythema, infiltration and desquamation by means of a modified Psoriasis Area and Severity Index (PASI) (5). The severity of the psoriatic lesions was recorded on a five-point scale (0 = absent, 1 = slight, 2 = moderate, 3 = severe and 4 = very severe). Patients were assessed before treatment and once a week during the treatment period. The maximum treatment period was 4 weeks.

The efficacy was evaluated by comparing PASI score at the end of treatment to PASI score at baseline using the Wilcoxon matched-pairs signed-rank test. PASI scores at baseline and 1, 2, 3 and 4 weeks after the start of treatment were compared using the non-parametric Friedman two-way analysis of variance. $p < 0.05$ was regarded as statistically significant.

RESULTS

Patients participated in the study until their psoriasis was markedly improved or cleared or they withdrew from the study. On average, patients participated for 3.3 weeks (range 1–4 weeks).

Of the 15 participating patients, the mean baseline score for the body site receiving treatment every day was 8.5 ± 2.7 and that for the site treated every other day was also 8.5 ± 2.7. The PASI score decreased significantly on both sides of the body during the treatment ($p < 0.001$) (Fig. 1). At each assessment there was no statistically significant difference in PASI score between the two body sides during the 4-week treatment period.

DISCUSSION

Our study confirms the effectiveness of CCT for treatment of chronic psoriasis and indicates that treatment every other day has the same effect as daily treatment. To improve the skin penetration of coal tar, tar treatment was followed by a bath. Without doubt a significant amount of the tar is thereby removed from the skin surface. CCT-treated patients are UVA light-sensitive in the days following tar treatment; together with our data this provides clear evidence that tar has a prolonged effect in the skin. In our study patients had a bath every day; having a bath every other day might have produced an even better effect on the psoriasis, by removing less tar and thus extending the effectiveness of the treatment. Further studies need to be done to determine exactly the duration of the effect of tar in the skin.

CCT treatment three times a week allows the patient to be treated in an outpatient clinic every other weekday. This increases the possibility of patients receiving CCT treatment still being able to continue with their jobs if a little odor is tolerated. This may encourage more patients to accept CCT as an alternative to other local/systemic treatments.

The safety of CCT treatment has been regarded as one of its great virtues but other side-effects besides smell and staining of clothes (4) must be considered. Coal tar contains a large number of polycyclic aromatic hydrocarbons (PAH), which have been found in blood (6) and urine (7), but their systemic toxicity is still unknown. Absorbed PAH can be metabolized to reactive derivatives that bind to DNA (8) and these PAH–DNA binding products are thought to be involved in PAH-induced carcinogenesis (8). However, no clear evidence of an increased incidence of skin cancer has been reported in patients who have been exposed to therapeutic doses of coal tar (3, 9, 10).

In conclusion, replacing the traditional daily CCT treatment with treatment every other day in an outpatient clinic will without doubt be an attractive alternative for patients suffering from chronic plaque psoriasis.

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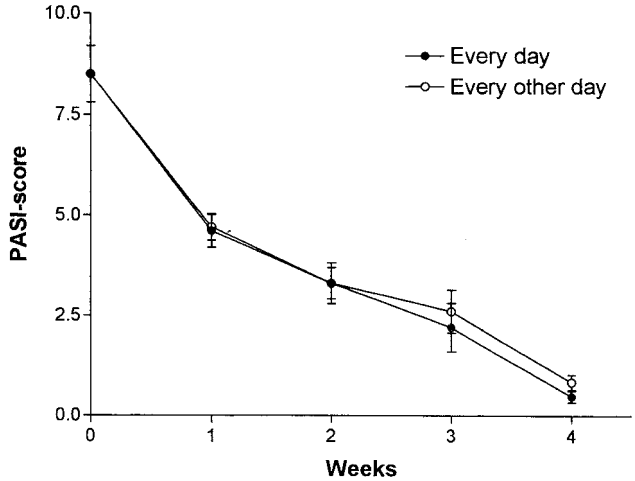

Fig. 1. Change in the modified PASI score during the 4-week treatment period. Bars represent standard deviations.

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