

A COMPARISON OF TOPICAL TANNIC ACID VERSUS IONTOPHORESIS IN THE MEDICAL TREATMENT OF PALMAR HYPERHIDROSIS

C L Goh, K Yoyong

ABSTRACT

This is a report comparing the efficacy of tannic acid lotion (an astringent) and iontophoresis in the medical treatment of idiopathic hyperhidrosis. Ten patients with long-standing symptomatic idiopathic palmar hyperhidrosis were recruited into the study. One palm was treated with daily tannic acid (20%) lotion and the opposite palm with iontophoresis. Visual scoring using a visual analog scale by patients and assessors showed the mean score to be significantly lower on the iontophoresis treated palm than the tannic acid treated palm. There was significant reduction in the severity of hyperhidrosis on the iontophoresis treated palm after treatment. There was also a significant reduction in transepidermal water vapour loss on the iontophoresis treated palms. The study indicated that iontophoresis is an effective medical treatment for idiopathic hyperhidrosis. The disadvantage of iontophoresis is its short-lived effect. Patients need to undergo the treatment weekly to achieve euhidrosis.

Keywords: astringent, sweaty palm, transepidermal water loss, tannic acid, iontophoresis

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INTRODUCTION

Palmo-plantar hyperhidrosis is a common skin disorder encountered in the skin clinic. Most cases of hyperhidrosis are idiopathic. The commonest medical treatment include topical antiperspirants^(1,2) and iontophoresis^(3,4).

In previous reports, response to hyperhidrosis is based on subjective and qualitative assessment. Tannic acid, an astringent, has been used for the treatment of hyperhidrosis⁽⁵⁾. However, there is no report to prove its efficacy in controlling palmar hyperhidrosis. In this study we compare the efficacy of topical tannic acid lotion with that of iontophoresis in the treatment of idiopathic palmar hyperhidrosis using visual scoring and objectively by measuring transepidermal water loss with an evaporimeter.

MATERIALS AND METHOD

Ten patients with symptomatic idiopathic palmar hyperhidrosis who have not received any treatment for their hyperhidrosis for more than 2 weeks were recruited into the study. Each patient was instructed to apply topical tannic acid 20% aqueous lotion on one palm every night. The other palm was treated with weekly iontophoresis. The decision as to which palm was to be treated with tannic acid was left to the patient. The assessor scoring severity and measuring the transepidermal water loss was "blind" to this until the end of the study.

Procedure/Assessment

The patients were given the topical tannic acid lotion before the study and instructed to apply it on one palm every night before retiring to bed. Patients were also instructed to attend the clinic weekly for iontophoresis treatment on the other palm. Iontophoresis was carried out using our standard iontophoretic

equipment (Ionos 7, Nemectron GmbH, W Germany). Glycopyrronium bromide 1% solution was used as iontophoretic medium. The principle of treatment has been described elsewhere⁽⁴⁾.

The severity of hyperhidrosis of each palm was assessed subjectively using a visual analog scale (0 = total dryness and 10 = very wet) by the patients and one of the authors at weekly interval, just before the patient begins his weekly iontophoresis treatment.

Transepidermal water vapour loss (TEWL) measurement was carried out with evaporimeter (EP1 Evaporimeter, Servomed, Valingby, Sweden). The rate of skin water vapour loss (expressed in grams of water/square metre per hour). The principle of the evaporimeter measurement has been described elsewhere^(2,6,7).

The patient rested in an air-conditioned room for 5 minutes before TEWL measurement is carried out. The palms were then dabbed dry with tissue paper. TEWL measurements were carried out on 5 areas of each palm viz, the skin overlying the 2nd metacarpo-phalangeal joint, 5th metacarpo-phalangeal joints, mid-thenar, mid-hypothenar eminences and the centre of the palm. The mean TEWL for each palm was obtained by averaging the 5 values. Measurement of TEWL for each palm was obtained by averaging the 5 values. Measurements of TEWL was carried out in the same room to ensure consistency of environmental condition. The temperature and relative humidity of the room was recorded during each follow-up.

Treatment was stopped after 4 weeks but visual scoring and TEWL measurement continued for a further 2 weeks.

Comparison was made between the mean visual score and mean TEWL of tannic acid lotion treated palms and iontophoresis treated palms.

Statistical analysis was carried out using non-parametric Signed test (for visual analog scoring) and the paired Student t test (for the transepidermal water loss measurement), p values of less than 0.05 were considered statistically significant.

RESULTS

The mean age of the 10 patients was 22.7 years (range 15 - 35 years). The mean duration of their symptomatic palmar hyperhidrosis was 14.7 years (range 8-30 years). The mean room temperature was 21.5°C (SD 2.5°C) and mean relative humidity was 53.3% (SD 5.2%).

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Tables I, II and III show the visual scores and TEWL changes during the study period. There was no significant reduction in visual scores (patient and author assessed) and TEWL changes on the palms treated with tannic acid lotion. There was significant reduction in the mean visual scores and TEWL measurement on the palms treated with iontophoresis after the third week. There was also significant differences in the mean visual scores and TEWL changes between tannic acid treated palms and iontophoresis treated palms after the third week of treatment.

The findings also showed that the visual scores and TEWL values began to increase 1 week after stopping iontophoresis treatment.

None of the patients experienced any significant side effects from tannic acid lotion treatment or iontophoresis.

Table I – Mean severity score of hyperhidrosis (visual analog scale 0-10 cm) as assessed by patients. Comparing tannic acid treated and iontophoresis treated palms.

Week	tannic acid	iontophoresis	p values
0	6.8	6.7	0.32
1	5.4	4.9	0.07
2	5.5	4.5	0.03
3	5.5	4.5	0.02
4	5.7	4.8	0.01
5	5.5	4.3	0.02
6	5.8	5.2	0.42

Table II – Mean severity score of hyperhidrosis (visual analog scale 0-10 cm) as assessed by assessors. Comparing tannic acid treated and iontophoresis treated palms.

Week	tannic acid	iontophoresis	p values
0	5.5	5.6	0.65
1	6.2	5.2	0.04
2	5.4	4.7	0.06
3	5.7	4.9	0.03
4	5.1	3.8	0.03
5	4.5	2.6	0.01
6	4.2	4.0	0.05

Table III – Mean transepidermal water vapour loss (TEWL) values comparing tannic acid treated and iontophoresis treated palms

Week	tannic acid	iontophoresis	p values
0	52.8 (12.0)	52.1 (8.5)	0.83
1	60.8 (16.3)	54.6 (12.1)	0.01
2	56.3 (13.0)	50.7 (14.7)	0.12
3	60.6 (14.5)	57.4 (12.5)	0.12
4	58.0 (18.2)	45.6 (13.4)	0.03
5	48.4 (21.6)	39.7 (14.5)	0.02
6	52.5 (20.5)	53.0 (18.8)	0.81

TEWL measured in gm of water/sq m/h
() Standard deviation

DISCUSSION

Iontophoresis has been used for the treatment of palmar and plantar hyperhidrosis for many years. Most reports indicated that iontophoresis offered transient euhidrosis of the palms varying from few days to few weeks⁽⁸⁻¹²⁾. With the evaporimeter, we were

able to measure objectively the rate of sweating (degree of hyperhidrosis) during treatment. Our findings confirmed the effectiveness of iontophoresis in the treatment of palmar hyperhidrosis. However, the response to treatment is delayed and transient. Symptomatic hyperhidrosis returned 1 week after stopping treatment. Tannic acid lotion (20%) did not appear to exert any effects on palmar hyperhidrosis.

Our patients appeared to observe more significant subjective response to iontophoresis treatment than the objective measurement with TEWL. This could be because patients tend to assess their response through the week whereas our TEWL measurement is conducted only 1 week after iontophoresis treatment, the effect of iontophoresis has probably worn off. Nevertheless, significant reduction in TEWL values were noted after 3 weeks of iontophoresis treatment whereas the palm that was treated with tannic acid did not show any significant reduction. It would also appear that iontophoresis treatment has a cumulative effect on controlling hyperhidrosis.

Besides iontophoresis, antiperspirants eg aluminium chloride hexahydrate has been found to be effective against palmar hyperhidrosis^(1,2,13). However, reports indicated that response to such treatment is even more short-lived⁽²⁾. Patients have to apply the antiperspirant daily to achieve any effect. In addition, such antiperspirant tends to cause skin irritation and may be unacceptable to the patients⁽²⁾.

The mode of action of iontophoresis is unknown. Studies have indicated that it does not act by causing the obstruction of the sweat duct. There was no anatomical changes in the sweat duct before and after iontophoresis⁽¹⁴⁾. The disadvantage of iontophoresis is the inconvenience to patients who need to travel to the clinic regularly for treatment. Miniaturized hand-held iontophoretic equipment are now available for patients to receive home treatment. Several reports have indicated their effectiveness^(3,4,8-12).

Cervical sympathectomy has appeared to be the only way to stop palmar hyperhidrosis permanently. The introduction of endoscopic minimally invasive cervical sympathectomy is reported to cause less morbidity and complications. It is more widely carried out nowadays^(15,16). Complications include flushes and dryness on the palms, forearms and arms. Patients may also experience compensatory hyperhidrosis on other parts of the body following sympathectomy. Dermatologists should consider the pros and cons of cervical sympathectomy before recommending surgery for such a benign skin disorder. It should only be considered after patients have failed medical control.

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