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Evaluation of the Impact of Transthoracic Endoscopic Sympathectomy on Patients with Palmar Hyperhidrosis

O. Young, P. Neary,* T. V. Keaveny, D. Mehigan and S. Sheehan

Department of Vascular Surgery, St Vincents University Hospital, Elm Park, Dublin 4, Ireland

Objectives. We assessed the impact of transthoracic endoscopic sympathectomy (TES) on the quality of life of patients with palmar hyperhidrosis.

Design. A retrospective questionnaire based study.

Methods. Patients undergoing TES at our institution between 1997 and 2002 received a SF-36 quality of life postal questionnaire. The pre- and post-operative symptoms were assessed. Statistical analysis was by means of the Student's *t* test.

Results. Ninety-four TES were carried out in 62 patients. Forty-one cases were female. The age range was 17–64 years. The mean follow-up period was 38.46 months. Mean hospital stay was 3 days. Compensatory hyperhidrosis was reported in 29 cases and only considered severe in four cases (9.7%). Forty-one patients replied to the questionnaire (66%). The overall quality of life (as assessed by the SF-36 form) was unanimously improved ($p < 0.0009$) and demonstrated significant improvements in social functioning ($p < 0.0002$), physical role limitations ($p < 0.0007$), emotional well-being ($p < 0.0007$) and overall energy levels ($p < 0.05$).

Conclusion. TES resulted in significant improvements inpatient's overall quality of life, social and emotional functioning. The procedure is associated with minimal morbidity and only a short inpatient stay is required. Patients should be cautioned on the possibility of compensatory hyperhidrosis which may occur in a small number of cases.

Key Words: Transthoracic endoscopic sympathectomy; Quality of life; Palmar; Hyperhidrosis.

Introduction

Hyperhidrosis is a benign but extremely socially disabling condition with an estimated prevalence of 1% in the western world.¹ Primary hyperhidrosis lacks a precise definition, but can be described as a condition of excess perspiration of the eccrine glands innervated by cholinergic fibres from the sympathetic nervous system. Excessive perspiration is accentuated by mental stimuli rather than heat and exercise, although studies have not reported affected patients to be unduly neurotic or nervous.² The gold standard for treatment of palmar hyperhidrosis has long been recognized as thoracic sympathectomy³ Though originally carried out as an open procedure, a minimally invasive thoracoscopic approach is now used. The effects are usually instantaneous, with patients leaving hospital with dry palms within 24 h. The impact of this surgery on the patient's lifestyle has only been addressed in a very small number of studies to date.^{4–6} Furthermore, the use of a validated quality

of life questionnaire for this purpose has not been consistently applied. Our own practice has used this surgical technique in almost 100 operative cases in the past five years, however, the success of the procedure has not been critically evaluated to date.

Methods

This was a retrospective, questionnaire-based study. Patients who underwent transthoracic endoscopic sympathectomy (TES) at our institution over the preceding five years were identified via the hospital inpatient coding system (HIPE) and from theatre records. Patient records were then accessed to assess demographics, inpatient operative management and detectable morbidity. The surgical approach of TES in our unit uses diathermy ablation of the sympathetic nerve chain, and ganglia over the bodies of the second and third thoracic vertebrae (T2 and T3). We specifically avoid diathermy higher than T2 and do not attempt to target nerves below T3. We also never undertake the bilateral sympathectomy in one operative sitting. Effective disruption of the sympathetic

*Corresponding author. Paul Neary, AMNCH Adelaide and Meath Hospital, incorporating the National Children's Hospital, Tallaght, 1 Sweetmount Park, Dundrum Dublin 14, Dublin, Ireland.

nerve chain is completed with extension of the diathermy ablation from the body of the thoracic vertebra to 2 cm laterally along the neck of the adjacent rib. A standardized and validated quality of life questionnaire (SF-36) was posted to all patients with accompanying instructions to document their pre and post operative symptoms in relation to eight scoring scales. Data collection was by a combination of postal questionnaire and clinical interview. Statistical analysis was by means of the Student's *t* test.

Results

Ninety-four TES were carried out in 62 patients, of whom 41 were female and 21 male. Thirty-one patients had bilateral procedures and one patient necessitated a repeat unilateral procedure. The patient age range was from 17 to 64 years, with a mean age of 29 years. The follow-up period ranged from three to 75 months, with a mean of 38.46 months. Mean hospital stay was three days (range 1–9).

There was no significant morbidity encountered, specifically no evidence of a Horner's syndrome and no blood transfusions were required. One patient had unilateral recurrence of symptoms, which resolved with a repeat procedure. Compensatory hyperhydrosis was the most common side-effect encountered, being reported in 29 cases, however, this was only described as severe in four cases (9.7%).

Forty-one of the 62 patients replied to the questionnaire (66%). There was no difference in the percentage of male responders and female responders with the corresponding response rates being 65 and 66%, respectively. The majority of patients that responded to the SF-36 questionnaire had undergone a bilateral procedure (59%). In males undergoing a unilateral procedure 82% replied whereas only 40% of females replied. In those patients that underwent a bilateral procedure then this trend was reversed with 91% of females replying and only 44% of males replying. In those who responded, the overall quality of life as assessed by the SF-36 was unanimously improved ($p < 0.0009$) (Table 1). The SF-36 form also demonstrated a statistically significant improvement in social functioning ($p < 0.0002$), physical role limitations ($p < 0.0007$), emotional well-being ($p < 0.0007$) and overall energy levels ($p < 0.05$). There was an expected increase in bodily pain reported at the time of surgery ($p < 0.001$). We also examined our results on the basis of unilateral versus bilateral procedures. Those patients that underwent a bilateral procedure reported further statistical improvements in nearly all the outcome parameters assessed by the SF-36 form.

Table 1. This table tabulates the outcome of responders using the SF-36 form. Patients are subdivided on the basis of pooled results, unilateral and bilateral procedures.

Scoring scales	Overall result	Bilateral procedure		Unilateral procedure		Pre Sx (range)	Post Sx (range)
		Pre Sx (range)	Post Sx (range)	Pre Sx (range)	Post Sx (range)		
Physical functioning	$P < 0.1$	950 (0–1000)	1000 (0–1000)	900 (0–1000)	1000 (0–1000)	950 (500–1000)	950 (0–1000)
Physical role limitations	$P < 0.0007$	300 (0–400)	400 (0–400)	300 (0–400)	400 (0–400)	300 (0–400)	400 (0–400)
Emotional role limitations	$P < 0.07$	200 (0–300)	300 (0–300)	200 (0–300)	300 (0–300)	300 (0–300)	300 (0–300)
Emotional well being	$P < 0.0007$	320 (0–460)	380 (160–500)	340 (80–460)	360 (160–500)	320 (0–460)	380 (200–460)
Energy	$P < 0.05$	260 (0–380)	260 (0–380)	280 (80–380)	280 (0–380)	220 (0–340)	200 (60–320)
Social functioning	$P < 0.0002$	125 (0–200)	175 (25–200)	125 (0–200)	175 (25–200)	150 (25–200)	200 (75–200)
Pain	$P < 0.0001$	100 (20–100)	100 (0–100)	100 (20–100)	100 (0–100)	100 (60–100)	100 (20–100)
General health	$P < 0.4$	375 (0–500)	375 (25–500)	375 (0–500)	375 (25–500)	350 (75–500)	325 (100–500)
Overall quality of life	$P < 0.0009$	2500 (520–3300)	2870 (410–3460)	2270 (520–3320)	2900 (410–3460)	2635 (1435–3300)	2835 (695–3155)

Results are tabulated as the median and range of pre-surgical and post-surgical values.

These included further improvements in both 'physical functioning' ($p < 0.01$), and 'emotional role limitations' ($p < 0.04$). Those patients that underwent a unilateral procedure did not demonstrate this statistical improvement.

Discussion

Current treatment options for palmar hyperhidrosis include topical aluminium chloride, direct current and even iontophoresis.⁷⁻⁹ All these approaches suffer from a transient success rate and the necessity of reapplication. Significant success has been reported using Botulinum toxin injections.¹⁰⁻¹² However, problems include pain at the site of administration, lack of consensus with regard to method and dosage and the temporary nature of the results (4-7 months).¹³ Endoscopic ablation of sympathetic ganglia was first described in 1949 and differing operative approaches include access through the second or the fourth intercostal space in the mid-axillary line.^{14,15} Complications reported with trans-axillary approaches include pneumonia (4%), infection (3%), Horner's syndrome (3%) and injury to the long thoracic nerve. The most common side-effect quoted is compensatory sweating affecting the trunk and lower extremities (5-74%). Nearly all patients in our experience described this as a minor nuisance compared with their original complaint and as a rule this improves with time.^{16,17}

Our study was a retrospective assessment of the quality of life in patients undergoing surgery for the non-life threatening condition of hyperhidrosis. Despite our data not being undertaken in a prospective study design format the core message from the data was clear. TES had a significant impact on the quality of life of patients with palmar hyperhidrosis. Significant improvements in patient's 'physical role limitations', 'emotional well being', 'energy' and 'social functioning' using the SF-36 quality of life questionnaire were demonstrated. Most importantly, patients recorded an overall significant improvement in their 'overall quality of life' ($p < 0.001$).

Sixty-two patients underwent surgery. Thirty-one patients underwent bilateral surgery. Forty-one patients replied to the to the SF-36 questionnaire (66%). Twenty-four of those that had bilateral procedures (77%) replied, whereas, only 17 of those that had unilateral surgery performed replied (55%). When one assessed the number of responders on the basis of sex distribution there was no difference found. Interestingly however, the majority of patients proceeding on to have bilateral procedures were female. It would seem inherently sensible that in those patients

that proceeded on to have the contralateral side operated upon then they would have been happy with the their initial outcome from the original side. This is reflected in the statistical analysis of unilateral versus bilateral responders with patients undergoing a bilateral procedure demonstrating further statistical improvements in the SF-36 outcome parameters assessed. Although, a number of those patients that have only undergone unilateral surgery are scheduled to undergo surgery on the contralateral side this bias in the responders may account for some of these study findings.

Problems with this study included patients reporting the SF-36 too general a questionnaire with certain questions seeming irrelevant given the condition being assessed. This fact serves to highlight the need for a quality of life questionnaire to be developed and tested with the specific needs and symptoms of the patient with hyperhidrosis in mind. The definite benefits of improved overall quality of life and both social and emotional functioning are, however, confirmed by this study. In our experience, the procedure is associated with minimal associated morbidity and only a short inpatient stay is required. Patients should, however, be cautioned on the possibility of compensatory hyperhidrosis which may occur in a small number of cases.

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