FLUOROSCOPY GUIDED CHEMICAL LUMBAR SYMPATHECTOMY FOR LOWER LIMB ISCHAEMIC ULCERS

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ABSTRACT

The purpose of this study was to assess the effectiveness of chemical lumbar sympathectomy in relieving pain and healing ischaemic ulcers in patients with peripheral vascular diseases. Thirty-one consecutive patients with ischaemic/ gangrenous lower limb ulcers, referred to the BPKIHS, Pain Clinic were observed prospectively after chemical lumbar sympathectomy using modified Reid Technique with 3 ml of 70% alcohol each at L2 and L3 level under fluoroscopic guidance. Pain relief and ulcer healing were noted in the follow up. Moreover, patients' abilities to resume at least part of their day to day work were also noted at three months follow up. Of the total 31 patients, 16 had Buerger's disease and the remaining 15 had non-Buerger's ischaemic ulcers of which 7 were diabetic. There was significant decrease in the pain score from mean±SD of 8.3±0.9 (pre-block) to 4.2±2.5 (post-block after 3 days) in zero to 10 Numerical Analogue Scale (NAS). By 3 months, 6 patients declined for follow up; 19(76%) of the remaining 25 patients reported pain relief, 18(72%) reported healing or decrease in the size of ulcers and 11(44%) were able to resume at least part of their usual work. Minor complications occurred in 5 patients and amputation was needed in 6 patients. Fluoroscopy- guided chemical lumbar sympathectomy is feasible, safe and effective in relieving pain and promoting ulcer healing in patients with ischaemic lower limb ulcers

Key Words: Buerger's disease; Chemical lumbar sympathectomy; Ischaemic ulcers.

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INTRODUCTION

Ischaemic limb ulcers are common entities in both developed and developing countries and often are the reasons for limb amputations. Patients with ischaemic limb ulcers are not only disabled by pain but are frequently socially neglected. Although various surgical and non-surgical management options are available for managing ischaemic limb ulcers, results are inconsistent, controversial and often unsatisfactory. Moreover, randomized controlled trials comparing various techniques are unavailable and availability of technology, operators experience, comfort level and incurring costs are the main determining factors for choosing the modality of management.[1]

Modalities such as spinal cord stimulation and revascularization surgeries have been claimed to offer better outcomes[2,3] but are sophisticated, costly and beyond the reach of most centres in the developing countries like Nepal.

Chemical lumbar sympathectomy is an easy and feasible alternative that has been shown to be as effective as surgical lumbar sympathectomy in providing desired outcome, if not better, in patients with peripheral vascular disease of the lower limbs.[4,5,6] Its nature of being minimally invasive is the obvious reason for being preferred to open surgery. This study was carried out to assess the effectiveness of fluoroscopy guided chemical lumbar sympathectomy using alcohol in relieving pain and healing of ulcers or gangrene in patients with ischaemic limb ulcers.

MATERIALS AND METHOD

This prospective observational study was carried out from March 2002 to December 2004. Thirty-one consecutive patients with lower limb ischaemic ulcers referred to the pain clinic of BP Koirala Institute of Health Sciences (BPKIHS) for chemical lumbar sympathectomy (CLS) were observed. Pre-block severity of pain was noted in all the patients using Numerical Analogue Scale (NAS) in which zero indicated no pain and 10 indicated maximum imaginable pain. Patients who had local infection at the injection sites and obvious anatomical deformities of the spines preventing precise needle placements were excluded from the study. Consent for performing the block was obtained from each patient before performing the blocks. Intravenous access was established and non-invasive blood pressure cuff, ECG and pulse oximeter probe were attached for monitoring in all the patients. Patients were kept in prone position with a pillow under the abdomen for performing the procedure.

All the blocks were performed with the help of 22G, 15 cm spinal needle under fluoroscopy (SIREMOBIL Compact™, Siemen, Germany) guidance using the lateral approach first described by Reid and co-workers.[7] After confirming the correct antero-lateral para-vertebral location of the needle tip by injecting 1 ml of radio-opaque contrast media, test block was performed with 3ml of 2% lignocaine. Subjective pain relief and definitive sensation of warmth in the affected limbs were taken as the desired test results after which 3ml of 70% alcohol in 0.15% bupivacaine solution (10ml solution was prepared by mixing 7ml of absolute alcohol with 3ml of 0.5% plain bupivacaine; of which 6ml was used and the remaining 4ml was discarded) was injected each at L2 and L3 level for achieving chemical sympathectomy. The patients were discharged after observation for 4-5 hours with advice to continue the oral medication (viz. Pentoxyphylline and NSAIDS) already on. Patients were advised to come for follow up after 3 days and the pain relief was noted using NAS. All the patients were sent home with the advice to come to the pain clinic in the event of increasing intensity of pain or development of new symptoms otherwise to come for follow up after 3 months. Subjective pain relief, healing of ulcer (indicated by ulcer healing, decrease in the size of ulcer or clear demarcation of healthy and gangrenous part) and resumption of at least part of the usual work were noted. Need of amputation and complications were also noted. Follow up for a period of 3 months was analyzed. Responses in Buerger's and non-Buerger's patients were compared.

Student's t test for continuous data and Chi-square test for categorical data were used for statistical analysis. A p-value of <0.05 was considered significant.

RESULTS

Successful needle placement was possible in all the patients enrolled in the study. In total, 31 patients were observed. The age of the patients ranged from 25 to 78 years with the male to female ratio of 25:6 (Table I). Sixteen (51.6%) patients were diagnosed as having Buerger's disease and the remaining 15 (48.4%) had ulcers/gangrene due to other peripheral vascular diseases of whom 7 (22.6%) were diabetic. Patients with Buerger's disease were all male with one exception and relatively younger as compared to non-Buerger's patients.

All the patients reported pain relief immediately following the injections. Overall, there was significant decrease in pain score following chemical lumbar sympathectomy from a mean NAS of 8.3±0.9 to 4.2±2.5 documented 3 days after the blocks. The decrease of NAS was less remarkable in Buerger's patients as compared to non-Buerger's patients. Twenty-two (71.0%) patients felt pain relief or decrease in pain intensity and it was similar in both groups of patients (Table II).

Six (19.35%) patients, 3 in each group were lost to follow up at 3 months. Of the remaining 25 patients, 19 (76%.0) still felt pain relief, 18 (72.0%) had signs of ulcer healing and 11 (44.0%) were able to resume at least part of their day to day work (Table III).

Six (24.0%) patients (4 Buerger's and 2 non-Buerger's) required amputation by 3 months. Three (12.0%) patients experienced transient burning sensation in L3 dermatome in the affected limbs and two non-Buerger's patients developed transient back pain amenable to NSAIDs for one week (Table IV).

DISCUSSION

Table I : Demographic Data and Affected Limbs

	Buerger's Disease (n =16)	Non-Buerger's PVDs (n = 15)
Mean Age ± SD(years)	42.1 ± 6.2	58.5 ± 12.8
Age Range (years)	34 – 60	25 – 78
Sex Ratio (M:F)	15:1	10:5
Affected Limb		
R Leg	6	9
L Leg	10	6

Table II : Pre and Post Block Pain Score and Pain Relief (observed 3 days after the blocks) in Buerger's and Non-Buerger's PVDs

	Pre Block Pain Score (NAS: 0-10) Mean ± SD(Range)	Post Block Pain Score (NAS: 0-10) Mean ± SD(Range)	Patients with Reported Pain Relief: Number(%)
Buerger's Disease (n=16)	8.3 ±0.95 (7 –10)	4.63 ±2.45* (2 –9)	11 (68.75%)
Non-Buerger's PVDs (n=15)	8.2 ±0.94 (7 –10)	3.92 ±2.61* (0 –9)	11 (78.57%)

** P <0.001*

Table III : Pain Relief, Ulcer Healing and Resumption of Work at 3 months

	Buerger's Disease (n = 13)	Non-Buerger's PVDs (n =12)	All Patients (n = 25)
Reported Pain Relief: number%	10 (76.9%)	9 (75.0%)	19 (76.0%)
Ulcer healing: number(%)	10 (76.9%)	8 (66.7%)	18 (72.0%)
Resumption of work: number(%)	6 (46.2%)	5 (41.7%)	11 (44.0%)

Table IV : Need for amputation and complications at 3 months

	Buerger's Disease (n = 13)	Non-Buerger's PVDs (n = 12)	All Patients (n = 25)
Amputation: number (%)	4 (30.8%)	2 (16.7%)	6 (24.0%)
Transient Burning Sensation: number (%)	2 (15.4%)	1 (8.3%)	3 (12.0%)
Transient back pain: number (%)	—	2 (16.7%)	2 (8%)

Incidence of peripheral vascular diseases particularly Buerger's disease is higher in Asian countries.[8] Ischaemic limb ulcers are associated with high rate of limb loss.[9] Amputation and consequent limb loss are strongly associated with poor quality of life and job losses.[10] Although there are inconsistent reports regarding the effectiveness of chemical lumbar sympathectomy (or surgical sympathectomy), they are commonly used modalities in treating ischaemic pain and ulcers.[11] Chemical lumbar sympathectomy is considered to have significant role in critical limb ischaemia in patients without options of vascular reconstruction surgery.[12] There are endocrine and metabolic evidences showing favourable effects of sympathectomy in Buerger's disease.[6,13]

Our study has shown that chemical lumbar sympathectomy under fluoroscopic guidance is effective in reducing pain associated with ischaemic ulcers significantly in both Buerger's and non-Buerger's peripheral vascular diseases. However, the reduction of pain was less remarkable in Buerger's disease which is probably due to inflammatory nature of the disease.

Chemical lumbar sympathectomy was effective in contributing to healing of ulcers (observed as healing or decrease in the size of the wound or clear demarcation of dead and healthy tissue) in more than 70% of cases. Our finding is comparable to the finding of Mashiah and coworkers[14] but better than that reported by Tay and colleagues.[15] This difference could be due to the difference in patient characteristics, sample size and definition of healing used.

Our study showed that chemical lumbar sympathectomy was effective in making more than 40% of the patients with ischaemic ulcers able to resume at least part of their day to day work and limiting the amputation in 24% of patients. Complications in our study were few and minor.

Relatively small number of patients, observation of only short term outcomes and large number of drop outs in follow up are important shortcomings in our observations. Despite these, it can be concluded that fluoroscopy guided chemical lumbar sympathectomy is feasible, safe and effective in controlling (or reducing) pain and promoting healing of ulcers in ischaemic lower limb diseases in developing countries with limited options for management of such patients. Observation of larger number of patients may verify our findings.

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