

INJECTION STREPTOMYCIN AND LIGNOCAINE COMBINATION FOR POSTHERPETIC NEURALGIA

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ABSTRACT

The aim of this study was to determine the extent of pain relief achieved by combining injections streptomycin with lignocaine for local infiltration or nerve block in the treatment of postherpetic neuralgia. The study was a randomized, blinded, placebo controlled clinical trial with twelve weeks of follow up period. It was carried out at skin centre, Military Hospital, Rawalpindi. 40-70 years old sixty patients of either sex having persistence or recurrence of pain more than one month after the onset of the eruption of herpes zoster, with complete fallen off crusts, were selected for the study. Age, sex and substance matched controls suffering from postherpetic neuralgia were randomly selected as controls. Out of these selected patients 30 were given injections streptomycin – lignocaine combination for nerve block while normal saline was infiltrated in rest of the 30, age, sex and site matched control patients. Intercostal, supraorbital, supratrochlear and infraorbital nerves were blocked in different patients. For other nerves without anatomical identification sites, local infiltration in the area of cutaneous nerves was done. One gram of streptomycin was dissolved in 4ml of 2% plain lignocaine for each injection. A total of 3 injections were given on alternate days. Pain assessment was done at different intervals with visual analogue scale. At 12 weeks the mean pain reduction was more than 80% (P= .000). Excellent and good pain relief rating in treatment group was more than 96% (P= .000). The study suggests that the combination of injection streptomycin-lignocaine for local infiltration or nerve block is highly effective in relieving postherpetic neuralgia without any side effect.

Keywords: Herpes zoster, postherpetic neuralgia, nerve blocks, streptomycin, lignocaine

INTRODUCTION

Herpes zoster is a common disease primarily affecting the elderly. Although some individuals experience no symptoms beyond the duration of the acute infection, postherpetic neuralgia (PHN) develops in about 30% of patients over 40 years of age [1] and is most frequent when trigeminal nerve is involved [1]. Although various definitions of PHN have been used, this clinical entity exists when pain persists either after a certain time period, most commonly persistence or recurrence of pain more than a month after the onset of the eruption of zoster [1,2] or after healing of the rash. The pain has two main forms, a continuous burning pain with hyperaesthesia, and a spasmodic shooting type, but a pruritic 'crawling' paraesthesia may also occur [1,2]. No particular treatment modality has been proved to be specific

or consistently effective [3]. Many modalities like antiviral agents [1,2,3,4] analgesics [1,2,4], antidepressants [1,2,3,4] anticonvulsants [1,2,4], topical capsaicin [5], nerve block [1-4,6] cryoanalgesia [4], Antipsychotic therapy [1,2,3,4], transcutaneous electrical nerve stimulation (TENS) [4,6], acupuncture [4,6], etc have been tried in the hope that either one or more of these may be effective. There are many anecdotal reports of the efficacy of infiltration of skin, peripheral nerves, or Para vertebral or epidural spaces with local anaesthetic drugs in patients with postherpetic neuralgia [6].

A few published reports describe the successful use of streptomycin in the treatment of trigeminal neuralgia [7]. The department of pain relief at Guy's Hospital, London has used streptomycin in the treatment of various neuropathic pains [8]. There are also few Pakistani reports of successful treatment of postherpetic

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neuralgia with streptomycin – lignocaine combination [9,10]. Cellular function is affected in a number of ways by streptomycin, but the exact mechanism is not clearly known. Most actions of aminoglycosides are antagonised by calcium [10]. They also affect protein synthesis, mitochondria, cellular respiration and the phosphoinositide system. [8,9,10]. It has been observed that after infiltration of streptomycin, the conduction velocity of the nerve is reduced [11]. It is therefore desirable to conduct more formal and controlled trials on the effects of streptomycin – lignocaine combination for nerve block in postherpetic neuralgia. This study was carried out to determine the extent of pain relief achieved by combining streptomycin with lignocaine for local infiltration or nerve block in the treatment of postherpetic neuralgia.

MATERIALS AND METHODS

The study was a randomized, blinded, placebo controlled clinical trial with twelve weeks follow up period. It was carried out at skin centre, Military Hospital Rawalpindi. 40-70 years old sixty patients of either sex having persistence or recurrence of pain more than one month after the onset of the eruption of zoster, with complete fallen off crusts were selected for the study. Age, sex and substance matched controls suffering from postherpetic neuralgia were randomly selected as controls. All those patients who had taken any specific systemic therapy like anticonvulsants, antidepressants or topical therapy like capsaicin etc for postherpetic neuralgia during the last one month were excluded. A total of 60 patients were enrolled. A detailed history including pain history was recorded. Out of these selected patients, 30 were given injections streptomycin- lignocaine combination for nerve block or local infiltration while normal saline was infiltrated in rest of the 30, age, sex and site matched control patients. One gram injection of streptomycin was dissolved in 4ml of 2% plain lignocaine. The injection streptomycin vial was then well shaken to dissolve the powder. For each injection site 2-4ml of streptomycin – lignocaine solution was used. A total of three injections were given in each case on alternate days.

PAIN ASSESSMENT

Pain assessment was performed with the help of visual analogue scale [6,12,13]. The patients

were presented with a strip of paper on which there was a 10cm long horizontal line. At one end there was written ‘no pain’ and at the other “the worst pain” the patients were asked to mark the line at a point which corresponded to the intensity of pain at that moment. Pakistan coin pain scale [13] was also used in conjunction with visual analogue scale in uneducated patients. The patients first described the relief of pain in annas or in paisas (e.g. 50 paisas or 8 annas relief from the initial pain) and then marked a point at visual analogue scale. Pain assessment was done at following intervals.

- a. At the time of enrolment
- b. Before all 3 injections
- c. At three weeks from first injection
- d. At six weeks from first injection
- e. At twelve weeks from first injection

PAIN RELIEF RATING [12,14]

Pain relief was graded as:

- a. Excellent = 75-100% pain relief
- b. Good = 50-75% pain relief
- c. Fair = 25-50% pain relief
- d. Poor = Less than 25% pain relief

RESULTS

A total of 60 patients completed the twelve weeks follow up after the start of treatment. 30 in the streptomycin lignocaine group and 30 in the control group. We evaluated differences among the study group and the control group by applying Student’s t test. The extent of pain relief rating was evaluated with a chi-square test. The mean age of the entire study group (n=60) was 58.30 years (\pm 8.7) with mean duration of pain 58.35 weeks (\pm 134.98). Severity of pain in visual analogue scale at the time of the presentation was 7.65 (\pm 1.46) with maximum reduction before 2nd injection to 4.73 (\pm 1.73). From 3 weeks to 12 weeks follow up period, there was further gradual reduction in pain severity. At 12 weeks interval the reduction in pain was more than 80%, with highly significant p value (P= .000). Excellent and good pain relief rating was more than 96% with highly significant p value (P= .000).

Table: Comparison of percentage of pain relief in group I and II

	Groups	Mean Pain Relief	S.D	T-Value	Significant (2-tailed)
Percentage of Pain relief before 2 nd Injection	1	43.36 %	17.01	2.03	0.04
	2	35.10 %	14.22	2.03	0.04
Percentage of Pain relief before 3 rd Injection	1	63.13 %	14.96	5.36	0.000
	2	40.35 %	17.82	5.36	0.000
Percentage of Pain relief at 3 weeks	1	77.01 %	17.80	6.49	0.000
	2	44.17 %	21.21	6.49	0.000
Percentage of Pain relief at 6 weeks	1	79.52 %	22.61	5.99	0.000
	2	45.59 %	21.21	5.99	0.000
Percentage of Pain relief at 12 weeks	1	82.36 %	19.94	6.46	0.000
	2	46.70	22.71	6.46	0.000

DISCUSSION

The purpose of this study was to determine the extent of pain relief achieved by combining streptomycin with lignocaine for local infiltration and nerve block in the treatment of postherpetic neuralgia. 60 patients of either sex in the age group between 40-70 years having complete fallen off crusts, were selected randomly for the study. Out of these 60 patients, 30 were randomly selected for the streptomycin lignocaine injection group and remaining, age sex and site matched patients were included in the control group (group II). By comparing the characteristics of the patients in group II, and I it was statistically proved that the two groups were well matched.

At the time of presentation both the groups had comparable severity of pain ($P = .10$). Before 1st injection this insignificant difference was maintained. Before second injection in both the groups the severity of pain decreased but the difference was insignificant ($P = 4.60$). When assessment of pain severity was done in both the groups before giving 3rd injection, it was found that the severity of pain was significantly decreased in group I ($P = .001$). Then at the follow up periods of 3 weeks, 6 weeks and 12 weeks, the severity of pain also significantly decreased in group I (P value = .000). The Pakistani Studies of Akhtar F.M [15], KHALID M et al [16], Salim M et al [9] and Saleem BM et al [10] are all anecdotal studies and the significance of decrease in severity of pain can not be highlighted. Akhtar's study [15] was actually a comparative study between the two groups of drugs but both drugs were tried on the same individual with unmatched assessment time. Kotani et al [12] and Rowbotham M [17]

conducted randomized controlled trials for the treatment of postherpetic neuralgia and assessed pain relief. In our study the mean percentage of pain reduction before 2nd injection in group-I was 43.36% and in group-II was 35.10% ($P = .046$) so it is clearly visible that maximum reduction of pain in percentage occurred after 1st injection in both group I and II (assessed 48 hours after the 1st injection and before giving 2nd injection). Before 3rd injection the mean percentage of pain reduction in group I was 63.13% and in group II was 40.35% with highly significant P value ($P = .000$). Thus after two injections there was maximum reduction in pain percentage. This finding is in accordance with the findings of Khalid M [16] in which 59.6% of the patients obtained complete relief from the pain after 2nd injection of a mixture of 2% xylocaine, 0.5% bupivacaine and 0.4% dexamethasone. In this study Khalid M[16] injected the mixture only into subcutaneous sites of maximum pain intensity at 06 weekly intervals.

When we assessed the percentage of pain relief at 3 weeks, 6 weeks and 12 weeks intervals in our study in both groups, we found highly significant P values ($P = .000$). Where we compared complete pain relief in group-I and group-II the P value was highly significant ($P = .000$). The complete pain relief in streptomycin – lignocaine group was 43.3% which is lower than 80.8% mentioned in the study of Khalid M [16] but in our study criteria for complete relief was 100% pain relief and no detail was given by Khalid M about the percentage of pain relief which was labeled as complete relief. Pain relief rating or grading was done with the help of pain relief rating chart as was done in many other

studies [12,14]. In our study there was excellent response in 73.33 percent cases, which is very high when we compare it with the study of Akhtar FM [15] but on the other hand Kotani et al [12] showed that 90% of patients in the methylprednisolone – lidocaine group had good or excellent pain relief rating. This finding is in agreement with our finding of 96.66 percent pain relief rating in good and excellent response at the end of 12 weeks of follow up. There were no recurrences after the complete recovery of pain however few patients in both the groups showed little upward variations in the severity of pain at different follow up intervals.

There were no side effects noted in our study. This is may be due to the fact that both lignocaine and streptomycin were used well below the toxic doses. The recommended dose limit of lignocaine for infiltration anaesthesia is 3 mg kg⁻¹ without adrenaline [18].

CONCLUSION

We conclude that combination of injection streptomycin with 2% lignocaine for local infiltration or nerve block is highly effective in relieving postherpetic neuralgia. At 12 weeks interval the reduction in pain was more than 80%, with highly significant p value (P= .000). Excellent and good pain relief rating was more than 96% with highly significant p value (P= .000). We also conclude that no significant side effects are associated with this mode of treatment for postherpetic neuralgia.

It is suggested that long term follow up controlled studies are required with different local anesthetic agents, alone or in combination to further confirm the efficacy of this type of treatment for postherpetic neuralgia.

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