

DOES TREATMENT WITH EPIDURAL ANALGESIA AFFECT LATER SPINAL CORD STIMULATION ?

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Objective: The only way patients with intractable angina pectoris can endure the daily pain is by using opiate. Epidural morphine or spinal cord stimulation for out patients is a possibility for this patient group. The aim was to study whether patients previously treated with epidural injections had more frequent electrode migration, higher stimulation needs and less effect of SCS treatment.

Design: A prospective non-randomized study with a four year follow-up period.

Setting: Department of Anaesthesia, pain section. A referral centre in institutional practice. Ambulatory care.

Patients: The patient group comprised 53 patients, all had been treated with opiates daily. 26 of the patients had epidural catheters for a mean time of one year before SCS.

All patients had intractable angina pectoris. For these patients further angioplasty or coronary bypass surgery was not technically possible, and even with maximal medication it was impossible to cope with the patients' angina pectoris and the only way the patients could endure the daily pain was by using opiate. Therefore, alternative therapies must be considered to give these patients palliation.

Intervention: Spinal cord stimulation with epidural electrodes stimulating paraesthesia in the area where angina is perceived.

Main Outcome Measure: Difference for the patients previously treated with epidural catheters in stimulation amplitude, frequency of electrode migration and effect of SCS.

Results: Stimulation demand ($p=0.09$), frequency of electrode migrations ($p=0.46$) and pain reducing effect ($p=0.16$) was not different for the group of patients who previously were treated with epidural catheters for longer periods (1 - 36 months).

Conclusions: SCS can be used in patients previously treated with epidural catheters with equal effect as in other patients.

INTRODUCTION.

Different pain treatments have been used for patients with otherwise intractable angina pectoris, for instance epidural catheters with morphine and local anaesthesia.

The aim of this present investigation was to study whether patients previously treated with epidural injections had more frequent electrode migration, higher stimulation needs and less effect of the SCS treatment.

PATIENTS and METHODS.

The SCS treatment was only offered to patients with severe incapacitating angina pectoris which could not be managed by antianginal medical therapy and who were not candidates for revascularisation.

The study group comprised 53 patients (10 women, 43 men) with a mean age of 61 (range: 44-75) years, and a mean duration of angina pectoris of 8.9 (range: 3-22) years.

All patients had been treated with opiates daily because of anginal pain for more than two years; 26 of the patients had been treated with epidural injections of morphine and local anaesthesia via epidural catheters (mean time one year (1 week - 3 years)). 35 (66%) of the patients had previous myocardial infarctions (AMI); 16 (30%) of the patients have had two or more myocardial infarctions. Coronary artery bypass surgery (CABS) had previously been performed in 42 (79%) of the patients; in 10 of

the patients on two or three occasions. 11 (21%) of the patients had previously undergone percutaneous transluminal coronary angioplasty (PTCA) . Each patient received what the referring cardiologist considered to be the maximum possible antianginal medication.

	Epidural	Non-epidural
Number	26	27
Age (years)	59 (46-70)	62 (44-75)
Female/male	6/20	4/23
Number of CABG	21 (81%)	21 (78%)
Number of PTCA	4 (15%)	8 (30%)
Previous AMI	17 (65%)	18 (67%)
Duration of angina pectoris (years)	10.1 (1-22)	7.9 (2-19)
NYHA	3.5	4
Opiate consumption recorded as intramuscular morphine equivalent dose	65/0	40/0

Clinical history and findings prior to SCS treatment for patients with previous epidural catheter treatment compared to patient without epidural catheters.

CABG; Coronary artery bypass grafting. PTCA; Percutaneous transluminal coronary angioplasty. AMI; myocardial infarctions. SCS; spinal cord stimulation.

For the 26 patients treated with epidural morphine an epidural catheter was inserted in the thoracolumbar region, and epidural morphine (2-3 mg) was injected once or twice daily as a start. No local anaesthesia was given. For some patients there was tachyphylaxia and they needed epidural doses up to 30 mg morphine/day.

The patients without epidural morphine treatment had their opiate as intramuscular injections and/or oral tablets.

METHODS.

The patients were seen by one of the authors every 1 to 4 months during follow-up. The follow-up period with SCS treatment was 4 years.

Opiate use and NYHA was obtained for all patients one month before SCS treatment and compared with the opiate use and NYHA for the 12th month of treatment.

Opiate consumption was recorded as intramuscular morphine equivalent doses, and the mean daily consumption was calculated. The patients' hospital records from the year prior to implantation were reviewed, and the number of admissions and days of hospitalization due to cardiovascular events (angina pectoris, suspected myocardial infarction, and myocardial infarction) were compared.

The pain reducing effect was evaluated at the follow-up. The effect of the stimulation was classified into five groups: excellent; good; fair; poor; and no pain reducing effect on an average angina pectoris attack. The criteria for the classification were as follows:

Excellent. The stimulation could depress all anginal attack.

Good. The paraesthesia could depress all anginal attacks of normal strength, the patient felt light pain at strong attacks.

Fair. when the patient expired the angina pain reduced.

Poor. The stimulation depressed only light angina attacks, and in connection with strong angina attacks the patient had to use medicine.

No effect. No reduction in pain during angina pectoris.

ECG was obtained at follow-ups and hospitalizations were examined to identify whether any myocardial infarction had occurred. If the patient died the cause was obtained.

The study was approved by the local ethic's committee, and the patients gave their informed consent before enrolment.

Statistical evaluation.

Two-sample rank sum test (Mann-Whitney) and chi-squared test were used to compare the two

groups. Wilcoxon rank sum test was used for comparison of use of morphine and NYHA classification. Differences were considered significant if $p < 0.05$.

RESULTS.

The 26 patients with epidural catheters prior to SCS treatment were comparable to the 27 patients without previous epidural treatment for age, sex, number of CABG, number of PTCA, previous myocardial infarction and duration of angina pectoris before SCS treatment.

	Epidural	Non-epidural
Opiate *) before/after SCS	65/0	40/0
Number of hospital admissions	3.7 (0-9)	4.6 (0-35)
Number of days in hospital	28.8 (0-173)	26.7 (0-138)
NYHA Before/with SCS	3.5 / 1	4 / 1
AMI /cardiac course of death during SCS	3/3	1/4
No effect of the SCS-treatment	8 (31%)	4 (15%)

*) ; Opiate consumption recorded as intramuscular morphine equivalent dose,

the mean daily consumption was calculated.

Findings prior to and during SCS treatment for patients with previous epidural catheter treatment compared to patients without epidural catheters.

	Epidural	Non-epidural
Number	26	27
Stimulation (amplitude in Volt)	3.0 (0.75-10.5)	4.0 (1.0-8.4)
Type of neurostimulator Itrel I/II	16/10	4/23
Electrode migration	9 (35%)	12 (44%)

SCS differences for patients previously treated with epidural catheter compared to patients without epidural catheters.

Conclusion.

Epidural morphine treatment in angina pectoris gives the patients good pain relief but was often associated with side effects, such as tachyphylaxis, catheter problems, etc. Therefore, patients and doctors often wish to change epidural pain treatment to SCS. Do these patients with previous epidural catheters have the same benefit from SCS treatment as patients who not have been treated with epidural catheters before SCS treatment?

We found no statistically significant difference for SCS treatment in patients previously treated with epidural catheters compared to patients treated without. The stimulation demand, frequency of electrode migrations and pain reducing effect were not different. AS a clinical observation we found that the introduction and placement of the electrode often was more difficult in the group of patients earlier treated with epidural catheters. This results was to be expected by changes in the epidural space as a result of repeated epidural injections. Also the lower stimulation requirements could be explained by more fibrosis and less fat in the epidural space.

REFERENCE.

The Clinical Journal of Pain. 1998. Vol . 14. No 4