Relevance Of Back School Therapy In Conservative Management Of Low Back Pain

R Gupta, N Kalsotra, Y Kamal, T Motten, R Gupta, D Singh

Citation

R Gupta, N Kalsotra, Y Kamal, T Motten, R Gupta, D Singh. *Relevance Of Back School Therapy In Conservative Management Of Low Back Pain*. The Internet Journal of Spine Surgery. 2008 Volume 5 Number 1.

Abstract

Back pain appears to be an inevitable accompaniment of the human lifecycle. The scale of the 'back pain epidemic' is alarming and has enormous economic implications. In light of our present knowledge, one of the most effective and economic methods of achieving this would seem to be backcare education administered in a group situation. This method of treatment, often referred to as Back School, is now internationally popular. It is based on available scientific knowledge of the physiology and mechanics of the spinal structures and their relationship to daily activities. Back School, by providing the patient with a better understanding of the problem, aims primarily at helping the patient take responsibility for his or her back pain, while relieving pain and functional disability. This study was carried out on 200 patients of chronic low back pain, attending the OPD of Post Graduate Department of Orthopaedics, Govt. Medical College Jammu for a period of one year to evaluate the relevance of back school therapy program and to compare the effectiveness of back school therapy program with conventional conservative treatment. The patients were randomly allocated to two groups of 100 patients each. The patients in Group A underwent Back school therapy, whereas the patients in Group B received conventional conservative therapy. Assessment was carried out before the treatment and after the treatment at four weeks, three months & six months post treatment. Changes in patients' level of pain, functional disability, and other related variables were compared in the two groups.The results of all the parameters after Back School Therapy were significantly better than conservative treatment. It was concluded that all chronic low back pain patients would benefit from a program of back care education, such as is offered by the Back School. It was also concluded that Back School therapy program is more effective than conventional conservative treatment in management of patients with chronic low back pain.

INTRODUCTION

Backache is a national, personal and clinical problem because it is experienced by most of the population at some time and is a drain on the nation's resources, personal because it can remain a major unresolved dilemma and clinical because not only is diagnosis difficult, but methods of treatment are conflicting and often unrewarding. Though it is difficult to produce a precise definition of low back pain, the term 'low back pain' is used to describe the symptom complex in which the pain is localized to the lumbosacral area, below the 12th ribs and above the gluteal folds. It may or may not be associated with 'leg pain' and neurological deficits like paraesthesias, numbness or muscular weakness in the lower limbs.

Low back pain is the commonest orthopaedic problem. It is most prevalent during our young & middle adult lives, between the ages of 25 & 55. It is now generally accepted that between 60-80% of the general population will suffer from low back pain some day and that between 20-30% are suffering from it at any given time. About 20- 30% of the new referrals in the orthopaedic outpatient clinic are the cases of low back pain (Waddle G & Hamblen DL). It is noted that the incidence of low back pain is on an increase in a geometrical progression in the last few decades & the doctors are faced with a lot of diagnostic problems.

CLASSIFICATION OF LOW BACKACHE (MACNAB I, 1977):

Low backache is a symptom and not a disease. The causes are manifold but maybe classified under the following headings:

- PSYCHOGENIC
- VISCEROGENIC
- NEUROGENIC
- VASCULAR

- SPONDYLOGENIC

MATERIAL & METHODS

This study has been carried out on 200 patients of chronic low back pain with or without pain radiating down along the lower limbs, attending the OPD of Post Graduate Department of Orthopaedics, Govt. Medical College, Jammu from November 2006 to October 2007.

CRITERIA FOR INCLUSION WERE

1. Somatic low back pain for atleast 3 months (with or without referred pain).
2. Age between 18 and 55 years.
3. Patients of both sexes.
4. Patients declared medically fit.
5. Criteria for exclusion were
6. Constant or persisting severe pain judged on clinical grounds to be due to irritation of nerve root. (Patients with definite neurodeficit were excluded).
7. Other musculoskeletal disabilities that would affect the patient's ability to cope with exercises.
8. Inflammatory arthritis.
9. Major surgeries in past one year.
10. Patients already involved in regular & frequent sporting activities (e.g. squash, swimming, fitness training, cycling) at least twice a week for past 6 months.
11. Previous physiotherapy within past three months.
12. Spinal injections, fractures, spondylolisthesis, malignancy.
13. Pregnancy.
14. Patients unable to walk without a walking aid.

Detailed history & examination was recorded in a proforma and diagnosis category was determined.

The patients were randomly allocated to two groups of 100 patients each.

Group A -The patients in this group underwent Back school therapy. This was an educational program consisting of four group sessions with 15 to 20 patients. The group sessions, led by an orthopaedician, lasted for 1 hour and the four group sessions were completed in two days. These sessions included the use of various Audio-visual aids, models & demonstrations. The following salient features were discussed -

1. Discussion of functional anatomy.
2. Mechanics of Spine were explained.
3. Discussions of low back pain, its etiology, frequency & therapy.
4. Movements and position of spine were analyzed with reference to pressure measurements.
5. Importance of decreasing load on back at work, home & rest were emphasized and advice regarding posture & simple activities was given.
6. Abdominal, back & leg muscle exercises were taught.
7. Question and answering session between the patients and the faculty.
8. Patients determined to have functional overlay were referred to psychiatrist for evaluation and proper management.
9. An exam was also conduct at the end to assess the patient's level of understanding.

Group B –The patients in this group received conventional conservative therapy which included bed rest, analgesics, referral to physiotherapist for diathermy, ultrasonic massages etc.

Assessment was carried out before the treatment and after the treatment at four weeks, three months & six months post treatment

The outcome measures included-

Modified Oswestry low back pain disability index:-

This questionnaire was used as the main subjective measure of functional disability. This questionnaire is divided into 10-sections, each comprising six different parts; the sections concern pain intensity, personal care, lifting, walking,

sitting, standing, sleeping, social life, traveling, and employment/homemaking. For each section, subjects must choose 1 of 6 statements that best describe their situation. Depending on the statement chosen, a score from 0 to 5 is given, 5 representing the greatest disability. The scores for all sections are added together. The total is then doubled and expressed as a percentage. It is scored on 0 -100 scale (0– no disability; 100 = total disability).

Visual analogue Score:-

This was used as the main subjective measure of pain. This is a pain drawing that is created at the first visit & at subsequent follow ups. Patient's complaints are listed in order of decreasing importance. The patient maps out the area of pain by designated symbol. Patients were asked to indicate their pain level by placing a mark along a 10-cm long horizontal line with the wording "no pain" at one end and "severe pain" at the other. The result was then indicated with a number from 0 to 10. On the re-examination the patient will fill out the pain drawing & give new values to subjective symptoms

Objective assessment of functional disability:-

This was done by determining improvement in the clinical examination of the patient. The following parameters were used-

Finger to floor distance: Forward flexion of the spine was recorded by measuring the distance between fingertips and floor. Most normal people can reach within 7cm of the floor.

Straight leg raising: This was measured on both sides. The patient lies supine. The examiner elevates the leg slowly with the knee maintained in the fully extended position by the examiner's hands. The range through which the leg must be raised before pain is experienced, was recorded.

Statistical analysis of the results was performed using Student-t test.

OBSERVATIONS AND ANALYSIS

AGE WISE DISTRIBUTION

The average age of the 200 patients was 38.39 years with the range from 18 to 55 years. Majority (50.5%) of the cases lie in the age group of 31 to 40 years. In Group A the average age of the patients was 38.62 whereas in Group B the average age of the patients was 38.17 years. Comparison of age between the groups showed no significant difference ($p>0.05$).

SEX WISE DISTRIBUTION

The study reveals that the prevalence of low backache is slightly more in the males compared to females, male to female ratio being 1.127:1. In Group A there were 52 males compared to 48 females whereas in Group B there were 54 males compared to 46 females. Comparison of gender between the groups showed no significant difference ($p>0.05$).

OCCUPATION OF PATIENTS WITH LBA#

Majority of the patients (37.5%) were non-sedentary workers. 31.5% of the patients were housewives, while sedentary workers constituted 31% of the patients.

DURATION OF LOW BACKACHE

The duration of low backache ranged between 3 months to 144 months, with the average of 25.895 months (2.158 years). In majority of the cases (58%) it was from 3 months to 1 year. The average duration of low backache in Group A was 26.55 months (2.21 years), whereas the average duration of low backache in Group B was 25.24 months (2.10 years). Comparison of duration of low backache between the groups showed no significant difference ($p>0.05$).

DISTRIBUTION OF CASES ACCORDING TO THENATURE OF PAIN AGGRAVATING FACTORS

It was observed that in 60% of the cases, walking; in 50%, bending of the spine; in 46%, prolonged standing and in 25%, coughing and sneezing aggravated pain. It showed that physical activity was an important aggravating factor in majority of the cases.

DISTRIBUTION OF CASES ACCORDING TO SEASONAL VARIATION IN INTENSITY OF PAIN

In 50% of the cases, in the present study, there was no change in the severity of pain by the change in the season. But in 45% of the cases, it got aggravated in the winter months and in 5% of the cases, it got aggravated in the summer months.

NUMBER OF CASES WITH OR WITHOUT RADIATION

The commonest mode of presentation in the present series was low back pain with radiation to lower limbs, which was present in 65% of the cases (Group A- 70%; Group B- 60%). 35% of the cases had low backache only.

NUMBER OF CASES WITH OR WITHOUT STIFFNESS

Stiffness of the back was present in 43% of the cases (Group A- 45%; Group B- 41%). It was absent in 57% of the cases (Group A- 55%; Group B- 59%).

NUMBER OF CASES WITH OR WITHOUT TENDERNESS

Tenderness of the spine was the commonest physical sign, being present in 77% of the cases (Group A- 79%; Group B- 75%). It was absent in 23% of the cases (Group A- 21%; Group B- 25%).

Figure 1

Table No: 10 DIAGNOSIS CATEGORIES

Diagnosis	Group A	Group B	Total	
	No.	No.	No.	%age
Chronic persistent Disc Degenerative Disease	30	27	57	28.5
Chronic Recurrent Disc Degenerative Disease	44	43	87	43.5
Facet Joint Arthritis	14	16	30	15
Myofascial Sprain/Strain	9	11	20	10
Osteoporosis	3	3	6	3
Total	100	100	200	100

Disc degenerative disease was found to be commonest cause of low backache, being present in 72% of the cases.

MODIFIED OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE SCORES (FUNCTIONAL DISABILITY)

The average pre-treatment scores were 25.90 and 24.96 in Group A and Group B respectively. There was no significant difference between groups before treatment (p>0.05). Both groups showed significant improvement at 1 month, 3 months and 6 months post treatment when compared to base-line data (p<0.001). Back school patients continued to make an improvement.

VISUAL ANALOGUE SCORES (PAIN)

The average pre-treatment scores were 6.06 and 6.00 in Group A and Group B respectively. There was no significant difference between groups before treatment (p>0.05). Both groups showed significant improvement at 1 month, 3 months and 6 months post treatment when compared to base-line data (p<0.001). Back school patients continued to make an improvement.

FINGER TO FLOOR DISTANCE (CMS)

The average pre-treatment scores were 21.44cms and 22.66cms in Group A and Group B respectively. There was no significant difference between groups before treatment (p>0.05). Both groups showed significant improvement at 1 month, 3 months post treatment when compared to base-line data (p<0.001). However, at 6 months post treatment, whereas the patients in Group A continued to show significant improvement (p<0.001), the patients in Group B failed to show any significant improvement when compared to base-line data (p>0.05).

STRAIGHT LEG RAISING (RIGHT)

The average pre-treatment scores were 77.02 and 75.85 in Group A and Group B respectively. There was no significant difference between groups before treatment (p>0.05). Both groups showed significant improvement at 1 month, 3 months and 6 months post treatment when compared to base-line data (p<0.001, p<0.05). Back school patients continued to make an improvement.

STRAIGHT LEG RAISING (LEFT)

The average pre-treatment scores were 77.61 and 76.55 in Group A and Group B respectively. There was no significant difference between groups before treatment (p>0.05). Both groups showed significant improvement at 1 month, 3 months post treatment when compared to base-line data (p<0.001). However, at 6 months post treatment, the patients in Group B failed to show any significant improvement when compared to base-line data (p>0.05), whereas patients in Group A continued to show improvement

Figure 2

Table No: 16 Comparison of Results between Group A and Group B

Outcome Measures	Pretreatment			1 Month			3 Months			6 months		
	Group A	Group B	'P' Value	Group A	Group B	'P' Value	Group A	Group B	'P' Value	Group A	Group B	'P' Value
MOLBPDQS	25.90	24.96	>0.05	20.38	22.08	>0.05	18.40	22.48	<0.001	16.04	23.72	<0.001
VAS	6.06	6.00	>0.05	3.44	4.08	<0.001	2.94	4.28	<0.001	2.56	4.97	<0.001
Finger Floor Distance	21.44	22.66	>0.05	17.02	20.63	<0.05	14.85	21.22	<0.001	13.51	22.15	<0.001
SLR² (R)	77.02	75.85	>0.05	80.52	78.53	>0.05	82.75	77.45	<0.001	83.71	77.33	<0.001
SLR² (L)	77.61	76.55	>0.05	81.15	78.63	<0.05	83.10	78.16	<0.001	84.39	77.58	<0.001

Inter-group comparison at 1 month post treatment showed that the results of Visual analogue Score, Finger to floor distance and Straight leg raising (Left) after Back School

Therapy were significantly better than conservative treatment ($p<0.001$, $p<0.05$). Inter-group comparison at 3 months and 6 months post treatment showed that the results of all the parameters after Back School Therapy were significantly better than conservative treatment ($p<0.001$).

MOLBPDQS; MODIFIED OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE SCORES

VAS; Visual analogue Score

SLR (R) Straight leg raising (right)

SLR (L) Straight leg raising (Left)

Figure 3

FIG 1(A & B): A BACKSCHOOL SESSION IN PROGRESS

Figure 4

FIG 2(A & B): GROUP EDUCATION USING AUDIO VISUAL AIDS

DISCUSSION

BACKSCHOOL

The Back school was first organized in 1970 at Danderyd Hospital, near Stockholm (Zachrisson Forssell M 1980). The purpose of back school is not only to create confidence in the patient to cope with his back troubles but also to avoid excess therapy & to decrease the expenses both for the patient and for the society. For most of the sufferers of low back pain without overwhelming complaints, the ‘Back School’ approach is most useful.

Back school is a kind of patient education to teach him to how to help himself & take active part in the management of the back pain. This is a group therapy of education, flexibility, strength, coordination & endurance training to prevent repetitive micro trauma to the spinal structures responsible for pain & degeneration (Kulkarni GS). In the yesteryears chronic low back pain was treated with

analgesics / bed rest or surgery. However, today there is much more emphasis on exercise, psychotherapy, consideration of ergonomics and less so on surgery.

The back school instructions usually begin with description of pertinent anatomy in terms understandable by even the less educated. Various audiovisual aids are used. The initial discussion leads to the information on function of spine & present knowledge of low back pain. The mechanics of spine are explained and patients are taught the postures & positions most beneficial to the back. Various exercises to strengthen the abdominal, back & gluteal muscles are taught. There are wide variations in opinion as to what exercises are the most beneficial; at present no clear cut advantage of one type over the others seems available, no matter what disease process was being treated. The back school can also include an exam to avoid misunderstandings. Physical activities, sports & games are encouraged to improve psychological & physical tolerance of pain.

The back school program can also be applied to a variety of definite conditions such as prolapsed intervertebral disc, stenosis & spondylolisthesis for their effective management & even proper postoperative care.

Thus the back school method emphasizes that back disability is often part of human condition; that everyone bears responsibility for his own health and one cannot place all the blame at the door of other individuals. Back school also removes much of mystique about the back disability. Because the patients are endowed with more responsibility for their cure they are more unlikely to fall prey to various magic cures unless their specific validity is demonstrated.

As of today, ‘Back schools ‘are running successfully in various institutions all over the world. Back school concept is not new in India, however it is not reflected much in practice. There are very few Back schools in India and a study to evaluate the effectiveness of a Back school has not been reported from India so far

Back pain appears to be an inevitable accompaniment of the human lifecycle. Approximately 80% of persons in western society experience back pain at some stage during their life, and this pain is sufficient to cause an alteration in lifestyle for at least a period of time and drives individuals to seek some form of treatment (Nachemson A 1980). Back pain is the single most expensive musculoskeletal ailment in western society (Kelsey J, White AA 1980). Until recently, it was believed that back pain was not a problem in “underdeveloped countries”, but recent evidence clearly shows that its incidence in such countries is similar to that in the “developed” world and that when back pain clinics are made available, local people flock to them for treatment (Frymoyer JW, Cats-Baril WC 1991). Backache is as universal as headache, but it is often impossible to be accurate about the source of the pain (Twomey LT, Taylor JR 1987). Despite improved diagnostic techniques, the difficulties of obtaining an accurate and precise diagnosis still present the greatest obstacle to further well directed research, as well as to effective treatment.

As the patient’s history of back pain extends over a period of months and years, psychosocial factors are likely to intervene and further complicate the problem. Any treatment should therefore be aimed at minimizing the likelihood of the development of a chronic back pain syndrome, with its tendency to passive dependency and learned pain behaviors.

In light of our present knowledge, one of the most effective and economic methods of achieving this would seem to be backcare education administered in a group situation. This method of treatment, often referred to as Back School, is now internationally popular. It is based on available scientific knowledge of the physiology and mechanics of the spinal structures and their relationship to daily activities. Back School, by providing the patient with a better understanding of the problem, aims primarily at helping the patient take responsibility for his or her back pain, while relieving pain and functional disability (Klaber Moffett JA et al. 1986).

AGE AND SEX:

Majority (50.5%) of the cases lie in the age group of 31 to 40 years.These observations are comparable with the studies conducted by Grant et al. (1948), O’Connell (1951), Chaterjee (1967), Bulos (1973), Airon et al. (1981) and Sharma and Sankaran (1980), which reported the peak age between 30 to 40 years. These observations are close to the studies conducted by Poppen (1945) and Friberg and Hirsch (1946), where most of the cases were between 30 and 50 years. Klaber Moffett JA et al. (1986) reported average age of 39 years and 6 months in their study. Shirado O et al. (2005) reported average age of 43.8 years in their study. Karkucak M et al. (2006) in their study reported that 45.4% were between 35-44 years of age.

OCCUPATION:

Our figures coincide with the study conducted by Poppen

(1945). Nathan (1959) and Clave and Galland (1930) noted higher incidence of degenerative changes and spondylolisthesis in persons engaged in heavy activities, like carrying weights and prolong standing. Troup (1965) stated that there is no absolute distinction between the type of heavy work which causes premature degeneration of the spine; yet it is logical to assume that degeneration is hastened by a series of micro injuries, due to abnormal postures, involving the vertebral bodies and the endplates. Sharma SC et al. (2003) in their series reported that 57% of the patients were heavy manual workers, 26% had to change/leave their profession, and 38% did not enjoy their present job.

However the present study do not confirm to the observations of Levy (1967) who is of the opinion that manual labour strengthens rather than weakens the musculature and the ligamentous support of the back and thereby reduces the likelihood of disc herniation. Sharma and Sankaran (1980) were of the opinion that the majority of the cases having protruded disc belong to well to do families engaged in office work. Karkucak M et al. (2006) in their series reported that 47.7% of the patients were housewives.

DURATION OF LOW BACKACHE:

In majority of the cases (58%) it was from 3 months to 1 year. These observations are close to the observations of Poppen (1945) (symptoms occurred over a period of 2 years); O'Connell (1951) (less than 6 months in 18.8%, more than 1 year in 63.6% and less than 5 years in 22.8%). However the present study do not confirm to the observations of Klaber Moffett JA et al. (1986) (7 years mean duration of symptoms); Karkucak M et al. (2006) (6.7 years mean duration).

PAIN AGGRAVATING FACTORS:

It showed that physical activity was an important aggravating factor in majority of the cases.These observations are close to those of Peyton and Simmons (1947), where in more than 70% of the cases, pain was aggravated by bending and coughing. Friberg (1939) reported coughing and sneezing as the pain aggravating factors. In Poppen's series (1945), 52% of cases had sciatic radiation of pain on coughing or sneezing and 47% of the cases were constipated.

CLINICAL PRESENTATION:

Commonest mode of presentation in the present series was low back pain with radiation to lower limbs, which was present in 65% of the cases (Group A- 70%; Group B- 60%). It was unilateral in 46% of the cases (Right- 26%; Left- 20%) and bilateral in 19% of the cases. 35% of the cases had low backache only. Stiffness of the back was present in 43% of the cases (Group A- 45%; Group B- 41%).

Poppen (1945) reported that recurrent low back pain was present in 95% of the cases of low back pain and in many cases it preceded the sciatica. Armstrong (1958) reported that backache was the commonest presenting symptom in 69% of the cases with disc lesion. Sharma and Sankaran (1980) in a series of 117 cases of prolapsed intervertebral disc, reported backache with sciatica in 76.1%, backache only in 12.8% and sciatica only in 11.1% of the cases. Hirsch (1965) concluded that analysis of patients' symptoms in low backache discloses a complex picture with marked variation in the distribution of pain and varying degrees of impaired function.

It was observed that tenderness of the spine was the commonest physical sign, being present in 77% of the cases. Limited motion of lumbar spine was present in 70% of the cases. Decreased lumbar lordosis and muscle spasm were present in 60% and 58% of the cases respectively.

THE FREQUENCY OF THE ABOVE SIGNS VARY FROM 40% TO 70% IN THE STUDIES CONDUCTED BY FRIBERG (1939), PEYTON AND SIMMONS (1947), O'CONNELL (1951) AND ARMSTRONG (1958).

References

1. Addison RG. Care of the back. Management of Low Back Pain 1982: 205-231.
2. Airon RK, Bansal RK, Jain AL. Plain radiography in lumbar disc prolapse. Ind J Orthop 1981; 15: 183.
3. Anderson JAD. Back Pain and Occupation. The lumbar spine and backpain 1980; 2: 57-82.
4. Armstrong GR. A monograph of lumbar disc lesions. 2nd ed. 1958.
5. Bergenudd H, Nilsson B. The prevalence of locomotor complaints in middle age and their relationship to health and socio-economic factors. Clin Orthop 1994; 308:264-270.
6. Bergquist- Ullman M and Larsson U. Acute low back pain in industry. A controlled prospective study with special reference to therapy and confounding factors. Acta orthop scand, suppl 1977; 170:1.
7. Brown MD. The pathophysiology of disc disease. Orthop Clin N Amer 1971; 2:359-70.
8. Frymoyer JW, Cats-Baril WC. An overview of the incidences and costs of low back pain. Orthop Clin North Am. 1991; 22:263-271
9. Kulkarni GS. Conservative care of Back pain and Backschool therapy. Text Book of Orthopedics and Trauma. 1999; 1(3): 2770-2785.
10. Kelsey J, White AA. Epidemiology and impact of low back pain. Spine 1980; 5:133-142
11. Klaber Moffett JA, Chase SM, Portek I, Ennis JR. A

controlled, prospective study to evaluate the effectiveness of a back school in the relief of chronic low back pain. Spine 1986; 11(2): 120-2
12. Twomey LT, Taylor JR. Physical Therapy of the Low Back. New York, NY: Churchill Livingstone Inc; 1987.
13. Nachemson A. Lumbar intradiscal pressure. The lumbar spine and backpain 1980; 2: 341-358
14. Waddell G. Hamblen DL. The differential diagnosis of backache. The practitioner 1983; 227:1167.
15. Zachrisson Forssell M. The Swedish back school. Physiotherapy 1980; 66:112-4.

Author Information

Rishabh Gupta, MS
Senior Resident, Postgraduate Department of Orthopaedics, Government Medical college Jammu

Nipun Kalsotra, MBBS
Junior Resident, Postgraduate Department of Orthopaedics, Government Medical college Jammu

Younis Kamal, MBBS
Junior Resident, Postgraduate Department of Orthopaedics, Government Medical college Jammu

Tarsem Lol Motten, MS
Senior Resident, Postgraduate Department of Orthopaedics, Government Medical college Jammu

Rakesh Kumar Gupta, MS
Senior Resident, Postgraduate Department of Orthopaedics, Government Medical college Jammu

Dara Singh
Professor and HOD, Postgraduate Department of Orthopaedics, Government Medical college Jammu