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Rehabilitation of Patients with Low Back Disorders in the County of Uppsala

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ABSTRACT

Low back pain is a common cause of inability to work. At the Rehabilitation Centre of the Uppsala County Council an annual number of more than 100 patients with this condition undergo an investigation aimed at evaluating their capacity for work and their need for rehabilitation. By compiling and analysing the information recorded in the case journals of the patients with low back disorders during the years 1969 to 1971, it was hoped that more knowledge would be gained about the factors constituting a hindrance to rehabilitation. The present paper is a preliminary report on an analysis of 47 case journals unsystematically selected from the entire material. The study verifies a number of previously reported observations, e.g. the low frequency of roentgenological changes. It is also noted that in a remarkably large number of patients no or only slight abnormalities were found on physical examination. Compared with the results of other investigations, there was a very low frequency of concurrent psychiatric disorders and abuse of alcohol. It was considered from this analysis that the information in the case journal material in question is adequate for elucidating the relevant problems in the planned larger investigation; further, it provides motivation for a future follow-up study.

INTRODUCTION AND BACKGROUND

A large number of people of occupational age suffer from low back pain, which in many cases causes inability to work. This problem has long been a subject of research efforts, and numerous investigations have been made, especially in the industrialized countries, with the aim of shedding light not only on its orthopaedic and general medical aspects but also on its psycho-social effects. In Scandinavia, studies have been reported by Hult (1954), Gogstad (1962), Magnusson (1968), Sparup (1969), Horal (1969), Natvig (1970), Tufvesson and co-workers (1970) and Westrin (1970), among others.

In Sweden those people who because of illness or disablement are unable to carry out their ordinary work generally undergo both medical and occupational rehabilitation. With respect to the latter, in order to make a more accurate evaluation of the patient's capacity for work and need for rehabilitation, a relatively extensive investigation is undertaken.

At the Rehabilitation Centre of the Uppsala County Council, about 350 patients are investigated each year. About 35% of these are categorized as patients with low back disorders.

Despite considerable efforts at medical and occupational rehabilitation, the impression is obtained that many of these patients, because of their low back pain, have great difficulty in readjusting to working life. By compiling and analysing the information recorded in the case journals of the Rehabilitation Centre concerning patients predominantly disabled by a low back disorder, and by examining the patients 4 to 5 years later, it was hoped that more knowledge would be gained about the factors constituting a hindrance to rehabilitation. The present paper concerns the first part of the investigation, i.e. an analysis of case journals from the Rehabilitation Centre.

An attempt was made to find out whether any correlations existed between particular symptoms, in combination with objective findings, and the outcome of the rehabilitation. The patients' physical and intellectual capacities and their social situation also seemed worthy of investigation in this context. It was considered that some type or types of patients with low back pain in whom the rehabilitational measures had a particularly good or poor effect might be distinguishable. Further, it was hoped that the results of this investigation would

have practical benefits such as: (1) improvement of the routine rehabilitational investigation; (2) establishment of appropriate methods of medical treatment; (3) improvement of prognostic evaluation; (4) establishment of measures to prevent recurrence.

MATERIAL, METHODS AND DEFINITIONS

During the years 1969 to 1971, 977 patients were investigated at the Rehabilitation Centre in Uppsala. Of these, about 35% (340 patients) were considered to have a low back disorder as their main diagnosis. 1971 was chosen as the last year in order to have at least 4 years between the investigation and the planned follow-up examination or, to use a more modern term, the product control. From the relevant case journal material, 47 were selected unsystematically.

The patients were divided into age groups of 5 years, with 15 years as the lower limit and 49 years as the upper.

Patients with low back disorders get in contact with Rehabilitation Centre mainly in two ways, either through the County Employment Board, or by referral from the Department of Orthopaedics at the University Hospital of Uppsala.

Orthopaedic examination

The examination was performed at the Dept. of Orthopaedics and with a few exceptions, by the same doctor. This latter was considered an advantage and is a reasonable guarantee of relatively good uniformity in the evaluation of the signs and symptoms. The patients were classified essentially according to the same principles as were used by Lennart Hult in the Munkfors investigation in 1954.

Lumbar spine insufficiency

By lumbar spine insufficiency is meant a condition with a more or less intermittent sensation of fatigue or pain located in the form of a band over the lumbar spine. The symptoms are often provoked by physical work in the forward bending position.

Recurrent lumbago

This is defined as repeated attacks of aching, pain on movement, and stiffness in the lumbar spine. Between attacks the patient is relatively free from symptoms.

Chronic lumbago

These patients have the same symptoms as the foregoing, but the symptoms are more persistent and there are no completely free intervals.

Sciatica

This group have not only symptoms from the lumbar spine but also radiating pain in the lower extremities, usually unilateral. The patient often has a concomitant sensation of numbness or paresthesia in the foot and toes.

By concurrent symptoms from the cervical and thoracic spine is meant aching, pain and stiffness in these spinal areas, in some cases combined with radiating pain in the upper extremities.

The objective findings in the orthopaedic examination were also classified in accordance with the definitions in the above-mentioned investigation by Hult:

Static spinal deformity

By this is meant deviations from the normal configuration of the spinal column, e.g. kyphosis, lordosis or scoliosis.

Restricted mobility

Extension, forward flexion and lateral flexion of the spine were evaluated. From the findings at the orthopaedic examination the patients were divided into two groups, one with restricted mobility and one with pronounced restricted mobility. This was only a rough classification but seemed to be the only one practicable at this stage of the investigation.

Lasègue's sign

This sign was tested in all patients, and for the purpose of this investigation it was considered sufficient to note only a positive finding.

Neurological deficit

By this is meant here the occurrence of sensory impairments, paresthesia, paresis, muscular atrophy and absence of the patellar or Achilles reflexes. The patients with lumbo-sacral rhizopathy were also divided into two groups according to whether or not the level of the lesion could be determined.

General medical evaluation

A detailed history was first taken, including both previous illnesses and the present condition. Any psychological disorders or abuse of alcohol were noted, and patients with such symptoms were always examined by a psychiatrist. A thorough physical examination was carried out and laboratory tests included blood analyses for haemoglobin concentration (expressed in grams per cent), red and white blood counts and sedimentation rate, and urinary analysis for protein and glucose. It was considered sufficient to record only the occurrence of disease in the respective organic systems.

Additional examinations

Roentgenological examination of the lumbar spine was performed in most patients, with special regard to disc degeneration, spondylosis and spondylolisthesis. If lumbar myelography with contrast medium was carried out, this was also noted.

Examination of isometric muscle strength was performed in all patients at the Department of Clinical Physiology of the University Hospital. This included tests of the muscle power and function in the upper and lower extremities and lumbar spine. Any pain in connection with the examination was noted. For the present

Table I. *Age distribution of the patient material*

Age	No. of patients
15–19	4
20–24	7
25–29	14
30–34	4
35–39	10
40–44	6
45–49	2
Total	47

study a recording was made only of whether the muscle strength was considered normal or reduced.

A *physical work test* was also usually included in the investigation. This also was performed at the Dept. of Clinical Physiology, using a bicycle ergometer with increasing work loads. The heart rate, respiratory frequency and blood pressure were recorded continuously. The patients were classified according to whether their physical work capacity was good, ordinary, somewhat low, low or very low.

A *psychological examination* was carried out in most cases. This was undertaken by a psychologist attached to the Rehabilitation Centre, with the aim of assessing the patient's intellectual and practical abilities. The patients were graded according to the scale: sub-normal, normal and above normal.

An extensive *social investigation* was performed, comprising school and vocational education, the occupational situation, absence from work, periods on the sick-list, family conditions, housing and financial situation, hobbies and any criminal record. It was considered important to get an idea, if possible, of the patients' annual incomes prior to the rehabilitational investigation and to compare them with those of the rest of the population in the years in question. Useful information on incomes was obtained from about half of the patients, but it should be pointed out that even these are only rough estimates and that the figures are therefore uncertain. The definitions of low and high incomes used by Holmberg & Ström (3) were applied in the present analyses. The income data of the low-income investigation are based on an analysis of Swedish people in 1966. In the investigation of low-income groups the income limits were listed in relation to the wages development from 1966 to 1970. The following income groups were thus defined: A low income meant an annual income of less than 20 000 Sw. kr, an average income an annual income of 20 000 to 40 000 kr, and a high income an annual income of more than 40 000 kr.

A rehabilitational investigation always results in a recommendation, and at present there are more than 50 different alternatives. The alternatives most relevant for patients with low back disorders may be summarized as follows: Return to previous work; change to different occupation; vocational training (patients who have not previously had such training); re-training (patients with previous vocational training who are trained for another occupation); higher education (junior secondary school, upper secondary school, university or equivalent); contribution towards a business; and retirement pension.

RESULTS

Of the 47 patients, 34 were men and 13 women. Four of them were of foreign nationality.

Thirty-three of the patients were referred for the investigation by the County Employment Board, and the rest by the Department of Orthopaedics at the University Hospital.

The age distribution is presented in Table I. All age groups are represented, though somewhat unevenly.

The general medical examination revealed that one patient had concurrent cardiopulmonary disease, 3 patients gastrointestinal diseases, 3 patients urogenital diseases and one patient contact allergy. Four of the patients were suffering from psychiatric disorders and 3 were heavy drinkers.

The results of the orthopaedic examination are given in Tables II and III. In 31 patients, i.e. the majority, lumbar spine insufficiency was the dominant symptom. Sixteen suffered from lumbago or sciatica. A few patients also had concurrent symptoms from the cervico-thoracic spine. In 19 of the patients no abnormal findings were made at the orthopaedic examination, and in the remaining 28 the main finding was restricted mobility of the lumbar spine, but in no case was this restriction pronounced.

Thirty-one patients had a roentgenological examination of the lumbar spine. In 8 patients, one or several discs in the lumbar spine were lower than normal, indicating degeneration. 10 patients also exhibited osteophytes on the margins of the vertebrae (spondylosis deformans). In one patient

Table II. *Symptoms at the orthopaedic examination*

Lumbar spine insufficiency	31
Lumbago recurrent	2
Lumbago chronic	4
Sciatica, back symptoms predominating	4
Sciatica, leg pain	0
Sciatica, equally troubled by both	6
Concurrent symptoms from cervico-thoracic spine	4
Concurrent lesion or disease of lower extremities	3

Table III. *Findings at orthopaedic examination*

No abnormalities	19
Static spinal deformity	10
Restricted mobility	20
Greatly restricted mobility	1
Lasègue's sign positive	12
Neurological deficit with established level of lesion	2
Neurological deficit with level uncertain	3

Table V. *Occupational situation prior to the rehabilitational investigation*

Housewife	1
Unqualified gainful employment	32
Qualified gainful employment	14
Light gainful employment	16
Heavy gainful employment	30

with sciatica and with neurological deficit, lumbar myelography with contrast medium was performed, with no evidence of herniation of the discs.

Examination of the isometric muscle strength revealed reduced muscle strength in 15 of the patients and normal strength in the remainder. A physical work test was performed in 38 patients. In 9 of them the physical work capacity was above normal, in 24 normal and in 5 subnormal.

The results of the psychological examination, which was carried out on 40 of the patients, can be seen in Table IV. The social investigation showed that 32 of the patients had only completed the compulsory school education, one patient higher school education and 15 patients vocational training.

Table V shows the occupational situation of the patients prior to the rehabilitational investigation. It is seen that the majority—about 30 of the patients—had heavy, unqualified work.

Fairly reliable information concerning annual incomes was obtained for 23 patients and are divided into low, average, and high incomes in Table VI. About half the patients whose incomes could be ascertained lay within the average income group, a few had a high income and the rest, mostly women, were in the low income group.

During the 3 years immediately preceding the investigation, 25 of the patients had been on the sick-list for more than 6 consecutive months or for short, frequent periods.

Four patients were unemployed at the time of the investigation. The family situation can be seen in Table VII. The majority of the patients (36) were married or cohabiting, and 20 of these had a gainfully employed husband/partner. The housing situation could be regarded as unsatisfactory in 6 cases. Twenty-two of the patients stated that they had active hobbies, and in 10 of them these involved physical activity. Two of the patients had criminal records.

The recommendations resulting from the rehabilitational measures are listed in Table VIII. The two predominant recommendations were change of occupation and vocational training.

DISCUSSION

As it was the intention to analyse the entire case journal material, it was considered necessary when selecting patients for the present pilot study only to take into account the completeness of the journals, and not the exact distribution of the total material with regard to sex, etc. For the same reason it was not considered to satisfy statistical demands of randomness.

The results reported here are derived from a small portion of a series of patients who underwent rehabilitational investigation during 3 consecutive years. As mentioned previously, the present study is to be regarded as a preliminary report for the planning of a broader investigation including the whole series of patients. No definite conclusions can therefore be drawn concerning the patients

Table IV. *Psychological examination*

Subnormal intellectual ability	4
Normal intellectual ability	26
Above normal intellectual ability	10
Subnormal practical ability	3
Normal practical ability	24
Above normal practical ability	13
Examination not performed	7

Table VI. *Distribution of incomes prior to rehabilitation*

Low income	7 (1 man, 6 women)
Average income	13 (12 men, 1 woman)
High income	3 (men)
No evaluable information	24

Table VII. *Family conditions*

Married or cohabiting	36
Husband or wife gainfully employed	20
Sole family supporter	3
Single without duty to support family	2
Separated or divorced at time of investigation	3
Family problems	3

with low back disorders undergoing rehabilitational measures.

In choosing the lower age limit consideration was taken of the fact that an increasing number of people undergo rehabilitational measures at a very young age and often at the end of the compulsory school period. The upper limit of 49 years may seem rather low, but this limit was chosen for practical reasons, so that all patients in the material should have a true possibility of utilizing the recommendations following the rehabilitational investigation. The total rehabilitation of a patient is often a long procedure and in practice covers several years. This material was somewhat unevenly distributed between the age groups. Thus there were two peaks, the 25–29 year group and the group of 35–39 years. This age distribution will certainly not reflect that of the total material, which could only be roughly estimated but which probably has a peak at 35–49 years. For this pilot study it was considered most important, however, to include patients from every age group.

Most of the patients had symptoms of lumbar spine insufficiency and only a few had more severe conditions such as lumbago and sciatica. In 19 of the patients, normal conditions were found on examination, and in the rest only mild disorders were observed. Other investigations on similar materials (e.g. Natvig, 1970) have revealed a considerably higher frequency of both mild and severe symptoms and signs. This may be explained by the fact that the age distribution of the present small series of patients probably deviates somewhat from that of the total material, in which it is expected that higher ages will predominate.

Among the 31 patients who underwent roentgenological examination, pathological changes were found to only a very small extent. La Rocca & Macnab (1970), and previously other authors, have demonstrated the limited value of roentgenological examination of patients with low back pain. Even from a prognostic aspect the roentgenological examination is not reliable, especially in young working people. In the younger age groups it is probably realistic, therefore, to assume that a correct evaluation can be made without roentgenological examination.

Other somatic diseases were present to a strikingly small extent, and it is of even greater interest that only 4 patients had a history of psychiatric disorder and only 3 were heavy drinkers. Other investigations of this category of patients have revealed psychiatric disorders in about 40% and alcoholism or abuse of alcohol in 18% (Natvig, 1970). This may be explained by a non-representative age distribution, but the low figures are interesting.

The majority of the patients were tested for muscle strength, physical work capacity and intellectual capability. On the whole it may be said that the patients appeared to be normal in these respects.

It is evident from the social investigation that the education of most of the patients ended with the compulsory school period, after which they had unqualified, heavy work.

As mentioned previously, it was difficult to obtain reliable information from the case journals concerning the patients' incomes prior to the rehabilitational investigation. Information on income was available for only about half of the patients. In a few cases this information concerned hourly wages, in others weekly or monthly wages and in a few, the annual income. Thus it must be pointed out again that the income figures are uncertain. Nevertheless the patients were placed in their respective income groups with respect to annual income. It may also be mentioned that the income distribution showed similarities to the statistics for all gainfully employed persons reported in the 1966 state investigation of low-income groups. The well known sex difference with re-

Table VIII. *Recommendations of rehabilitation centre following investigation*

Return to previous work	2
Change of occupation	16
Vocational training	15
Re-training	4
Higher education	7
Contribution towards a business	2
Pension	1

spect to income is also evident in this small material.

It was found that half of the patients had been on the sick-list for long periods prior to the rehabilitational investigation. This is an unexpectedly low figure in view of the fact that low back pain is one of the main causes of absence from work on account of illness, and that there was a waiting period of several months for investigation at the Rehabilitation Centre.

The housing situation could be regarded as unsatisfactory for only 6 of the patients. As this is a very important factor socially, which is certainly of considerable importance for adjustment to employment, it should be of interest to find out whether this low figure is representative for the total material.

The recommendations of the Rehabilitation Centre for this group of patients comprise seven alternatives. The two predominant recommendations were change of occupation and vocational training. In only one case was an early retirement pension suggested. Since there is reason to expect that in the total material from the years in question there will be a greater number of patients in the age group 40–49 years, the latter alternative, an early pension, will probably have a higher frequency in the planned, broader investigation. The recommendations will probably have their greatest interest, however, when related to the occupational situation of the patients 4–5 years after the rehabilitational investigation. It is planned to elucidate this question in a future follow-up study.

REFERENCES

1. Gogstad, A. C.: Psykiatriske klienter i attförings-institutt. Nord Psykiatr Tidskr *1:* 1962.
2. Gogstad, A. C.: Etterundersökelse av rehabiliteringsforanstaltninger. Nord Med 8, XI, 1962, *68:* no. 45, 1962.
3. Holmberg, P. & Ström, H.: Låginkomstutredningens första betänkande i sammandrag. Allmänna Förlaget, Stockholm, 1970.
4. Horal, J.: The clinical appearance of low back disorders in the city of Gothenburg. Acta Orthop Scand, Suppl. *118,* 1969.
5. Hult, L.: The Munkfors Investigation. A study of the frequency and causes of the stiff neck brachialgia and lumbago-sciatica syndromes, as well as observations on certain signs and symptoms from the dorsal spine and the joint of the extremities in industrial and forest workers. Acta Orthop Scand, Suppl. *16,* 1954.
6. Hult, L.: Cervical, dorsal and lumbar-spinal syndromes. A field investigation of a non-selected material of 1 200 workers in different occupations with special reference to disc degeneration and so-called muscular rheumatism. Acta Orthop Scand, Suppl. *XVII, 17,* 1954.
7. La Rocca, H. & Macnab, I.: Value of pre-employment radiographic assessment of the lumbar spine. Canad Med Ass J *4:* 49, 1969.
8. Magnusson, R.: Rehabilitering av skogsarbetare med ryggbesvär. Läkartidn No. 5, 1968.
9. Natvig, H.: Sociomedical aspects of low back pain causing prolonged sick leave. Acta Socio-Med Scand *2–3:* 117, 1970.
10. Sparup, K. H.: A sociomedical evaluation of back insufficiency. Scand J Rehab Med *1:* 74, 1969.
11. Tufvesson, B., Cardell, H. & Martelius, E.: Rehabilitering av 240 ryggpatienter. Läkartidningen, No. *46,* 1970.
12. Westrin, C. G.: Low back sick-listing. A nosological and medical insurance investigation. Acta Socio-Med Scand *2–3:* 127, 1970.

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