THE TREATMENT OF INTERVERTEBRAL DISC PROTRUSIONS WITH SALT

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The following quotation comes from the report of the October 1954 meeting of the Orthopaedic Association.

Q. One third of all orthopaedic outpatients complain of low backache. Has the panel any suggestions for coping with this vast number?

A. The panel has none.

If the question were put to a panel today the answer would be essentially the same.

Backache and neckache with its associated conditions viz., sciatica and brachial neuritis form about 12 per cent of the cases seen by general practitioners, and therefore the importance of this type of case is undisputed.

It was a feeling of inadequacy that prompted me to study the treatment of backache and other aches, which are given a variety of names, or lumped together and called rheumatism.

The orthodox approach consisting of shortwave diathermy, massage, exercises and immobilization with plaster gives disappointing results, and I was tempted to look round for more unconventional methods. I studied Dr Cyriax's approach to the problem and was impressed. His system of diagnosis should be taught to every student. Armed with it he would go into general practice knowing how to examine the painful shoulder, the painful neck, or the painful back, something he cannot do at present.

Convinced of the need for this kind of positive physiotherapy, a clinic was set up in which selected cases were treated with manipulation and traction. The results were encouraging but in my opinion too many cases were responding incompletely, or taking rather a long time to recover fully.

After treating about 200 patients I came to the conclusion that the majority of cases of backache were due to varying degrees of intervertebral disc protrusion primarily, but I felt there were factors operating other than mechanical strains producing the derangement.

In 1952, Charnley reported on the ' imbibition of fluid as a cause

of herniation of the nucleus pulposus '.

To reduce any oedema that might be present in the disc I gave a number of patients mersalyl twice weekly, or saluric three times weekly, but the results were disappointing. Sometimes there was a dramatic improvement for 24 hours but it was never maintained.

The fact that some cases of lumbago rapidly improved and others persisted was puzzling. Eventually an hypothesis was conceived which postulates that due to a loss of sodium for various reasons (e.g. chilling, emotional stress, or infection) minor variations in osmotic pressure occur and when the pressure is temporarily lowered the nucleus pulposus, which has strong hydrophilic properties, takes up fluid. If there is no further loss of sodium the fluid is absorbed rapidly and the lumbago quickly improves; but if the factor responsible for the loss of sodium still operates and body stores of sodium are low then the attack continues. To correct this, salt is administered.

The Investigation

Two hundred cases have been observed in this investigation. Diagnosis was based on a thorough clinical examination; unfortunately x rays are of little value in this type of case. A careful history was taken; movements of the spine were examined noticing limitation or pain in any direction; muscles and tendon reflexes were tested.

TABLE I
DISTRIBUTION OF INTERVERTEBRAL DISC PROTRUSIONS

Type of case	*Group A*		*Group B*	
	No. of cases	*Percentage*	*No. of cases*	*Percentage*
Number of cervical discs..	35	28	15	21
Number of dorsal discs ..	6	5	3	4
Number of lumbar discs..	86	67	55	75

All patients received a course of manipulation or traction depending on the type of case. Manipulation was carried out without an anaesthetic and traction consisted of a pull of 90 + lbs. for about 30 mins. daily. Sodium chloride was administered in 1G. enteric coated tablets to group B.; if the patient objected to their size 0.5G. tablets were dispensed. The dose was the same in every case viz. 8G. daily. There were very few complaints about thirst in spite of the fact that fluids were restricted to 3 pints daily. When patients were given a prolonged course of tablets to prevent recurrences, the blood pressure and weight were recorded at the beginning and end

of treatment. The readings did not alter except for a loss of weight in a few cases.

TABLE II

RESPONSE TO TREATMENT AND THE AVERAGE NUMBER OF TREATMENTS REQUIRED

Response	*Group A*	*Group B*
Percentage patients symptom free	68	83
Percentage improved	26	12
Percentage unchanged	6	5
Average number of treatments	7	4

The percentage of cases with neurological signs, e.g. muscle weakness, diminished tendon reflexes, pins and needles or combinations of these was not more than 15 per cent, but if one includes restricted straight leg raising the percentage goes up to 71 in group A, and 75 in group B. It will be seen that the number of patients rendered symptom free was greater and the average number of treatments required was less in group B who were receiving sodium chloride.

The patients who were improved only were in my opinion cases of a mixed lesion, viz., a degree of intervertebral disc protrusion combined with strain of one of the interspinous ligaments, or of the posterior sacro-iliac ligament. These were treated by injection with a proliferating solution, as were also the patients who remained unchanged. This small group had a purely ligamentous lesion.

It was interesting to note that less than 5 per cent of the total number of patients attending the clinic for treatment of backache or neckache were unsuitable. These included patients with secondaries in the spine, or with such a marked psychogenic overlay that it was deemed unwise to start treatment. Ages ranged from 15 to 72 with an average age of 38.

One patient who developed a severe sciatica with weakness of the tibialis anterior, extensor hallucis longus and the peroneal muscles refused to have manipulation or traction, and was treated with sodium chloride only. Within a week his pain was much better and the affected muscles stronger. Within four weeks of the commencement of treatment he returned to work with only slight weakness of the muscles.

Discussion

Charnley (1952) drew attention to the fact that though the acute lumbago syndrome can follow severe strain in lifting weights, more

often it starts without recognizable injury, or if any injury is encountered then it is usually trivial. He showed that the nucleus pulposus could take up more saline than other tissues, and against resistance of 150—300 mm. Hg. The controls absorbed some saline but did not generate pressure.

Chilling which is often blamed by patients for causing lumbago may be a predisposing factor in an attack of disc protrusion. Bass (1954) noted that although cold diuresis did not invariably occur, there was always an increased excretion of sodium chloride and magnesium in response to cold. I am suggesting that loss of sodium as a result of chilling causes a temporary fall of osmotic pressure, and the nucleus draws in fluid. One of three things may then happen. The swelling may be so great as to rupture the annulus with the dramatic onset of backache for no apparent reason, or the protrusion may not develop until the person bends or lifts a weight. The third possibility is that the fluid is absorbed and the unsuspecting victim escapes. Cases of intervertebral disc protrusions are seen as frequently during hot weather as in the wintertime. This may be explained by the fact that there is a loss of sodium in perspiration.

Depression and emotional upset may lead to an increased excretion of sodium as reported by Crammer (1959) and de Wardener and Miles (1953). This in my opinion explains why the highly strung apprehensive type of person does not respond so satisfactorily to any form of treatment for backache, unless he is receiving sodium chloride, when the response is markedly better.

The evidence suggests that fluid changes resulting in increased pressure do occur in the intervertebral discs and are responsible for many attacks of backache. I also think it possible that much non-rheumatoid rheumatism may be due to the same cause.

Conclusion

It is probable that an adequate salt intake will do much to prevent attacks of lumbago, sciatica, and other pains due to disc protrusions although it may not prevent them entirely, because one can imagine a temporary massive loss of sodium under certain circumstances.

I do think, however, that an adequate amount of salt in the diet is essential to a rapid recovery from an attack of ' slipped disc '. I am quite convinced that energetic early treatment with manipulation or traction combined with sodium chloride therapy prevents months of disability.

Summary

A hypothesis is put forward in which it is suggested that minor

variations in osmotic pressure due to sodium loss for a variety of reasons, may lead to swelling of the intervertebral discs with lumbago, sciatica, or fibrositis resulting.

An investigation is described which shows that treatment is much quicker and considerably more effective in a group of patients receiving sodium chloride.

Acknowledgment

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THE AUSTRALIAN COLLEGE OF GENERAL PRACTITIONERS

The third issue of the Australian College's *Research Newsletter* has been published by the executive of the research committee of the Australian Council, under the editorship of the chairman of the research committee, Dr J. G. Radford. Dr W. A. Breinl describes a morbidity survey, at present in its pilot stages. He uses an index card, 6″ by 4″, for each diagnosis, and records upon it in columns the details of the patient, the number of attendances, time lost off work, investigations undertaken, specialists consulted, and disposal. The system seems simple enough to be maintained under the conditions of practice, and should give useful results.

The Australian College is also collecting material from patients with suspected virus infections to determine the pattern of virus diseases in general practice. This investigation originated in the New South Wales Faculty, and it is hoped that it will gather momentum and lead to the formation of a regular Epidemic Observation Unit. Plans are announced for an accident survey and for a study of the prophylaxis of recurrent furunculosis. An obstetric survey is also contemplated.

The Queensland Faculty of the Australian College publish a regular newsletter, and this gives details of research activities, conferences, and other college news.