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Diagnostic Differences Between General Practitioners and Orthopaedic Surgeons in Low Back Pain Patients

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Abstract

Background. There is a growing consensus on low back pain treatment. However, whether this extends to diagnostic labelling is still largely unknown. The aim of this report was to compare the diagnostic assessment of low back pain patients between general practitioners trained in manual therapy and orthopaedic surgeons.

Methods. Population-based randomized controlled trial in which 160 patients with acute or sub-acute low back pain were assessed and treated by general practitioners or orthopaedic surgeons. Information on diagnoses and use of diagnostic imaging was obtained from medical records and physician questionnaires covering the ten-week treatment period. The Quebec Task Force classification and free text analysis were used to group diagnostic labels.

Results: At baseline there were no significant differences in medical history, findings at physical examination and distribution of the Quebec Task Force diagnostic classification between the patient groups, indicating that they were similar. However, there were significant differences in physicians' use of diagnostic labels for local pain and their characterisation of radiating pain. General practitioners used more terms from manual medicine and reported more pseudoradicular pain than orthopaedic surgeons, who used non-specific pain labels, reported more true radicular pain and used more x-ray examinations. Differences were found at all times from first visit to ten week follow-up.

Conclusions: There were significant differences in diagnostic assessment and use of diagnostic radiology between general practitioners and orthopaedic surgeons.

Introduction

There is a growing consensus as to how to treat low back pain. This circumstance has been manifested in numerous published evidence-based guidelines. The currently most influential publication on this subject in Sweden is the review issued by the Swedish Council on Technology Assessment in Health Care (1). There is general scientific agreement on keeping patients active and limiting medical interventions.

However, studies have shown a differential between recommendations in guidelines and actual clinical practice (2–4). Differences in low back pain diagnostic work-up, for example radiological examinations and blood tests, have been shown between physicians and chiropractors, and also among physician specialities (5,6). Therapists of different occupations and specialities often have a different case-mix, and for this reason use of different diagnostic terms might be expected (7,8). However, if they were treating the same patient category would then the same diagnostic

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labels be used? We have not found any reports on differences in diagnostic labelling for low back pain between physician specialities. Moreover, possible impact of diagnostic labelling on therapy and prognosis for low back pain does not seem to have been a focus in controlled trials.

We performed a randomised controlled clinical trial on the effects of adding manual therapy, including muscle stretching and steroid injections to the stay-active approach (9,10). The diagnostic work-up during the treatment period was done by GPs trained in manual therapy or orthopaedic surgeons. The purpose of this report was to compare diagnostic labelling and use of radiography in the two physician categories participating in this trial.

Subjects, materials and methods

Study population

The study was performed from January 1994 to December 1998 in the Swedish province of Gotland, an island in the Baltic Sea with 58000 residents. Study design, patient recruitment, therapists and therapy within the trial have been presented earlier (9). Briefly, a factorial study design was used with four treatment groups, two experimental and two reference groups. The patient flow in parts of the study relevant for this report is illustrated in Figure 1. Three hundred and sixteen patients were referred to the study, of whom 160 fulfilled the inclusion criteria and agreed to participate. For the analysis of physicians' diagnostic performance the two reference groups treated by two orthopaedic surgeons (n=71) were compared with the two experimental groups treated by two general practitioners (n=89). The study was approved by the Research Ethics Committee at Uppsala University.

Data collection

A standardised orthopaedic physical examination was performed at baseline by the recruiting physician. Relevant data were used as baseline data for this report. Information on socioeconomic data, earlier low back pain infirmity, treatment before the start of the study and symptom duration at the beginning of the study was obtained by questionnaires. No radiological screening was done during the baseline assessment.

Quality of life was assessed with the Gothenburg Quality of Life Instrument (11). For this report the Complaint Score and Well-being sub-scales were used. The Complaint Score is a list of 30 general symptoms. The patients were asked to indicate which of these symptoms they had experienced during the past three months. The Well-being sub-scale contains questions on dwelling, family situation, work situation, economy, perceived health, physical fitness, hearing, vision, memory, appetite, mood, energy, patience, self esteem, and sleep. The responses were given on 100 millimetre visual analogue scales ranging from "poor" to "excellent, could not be better".

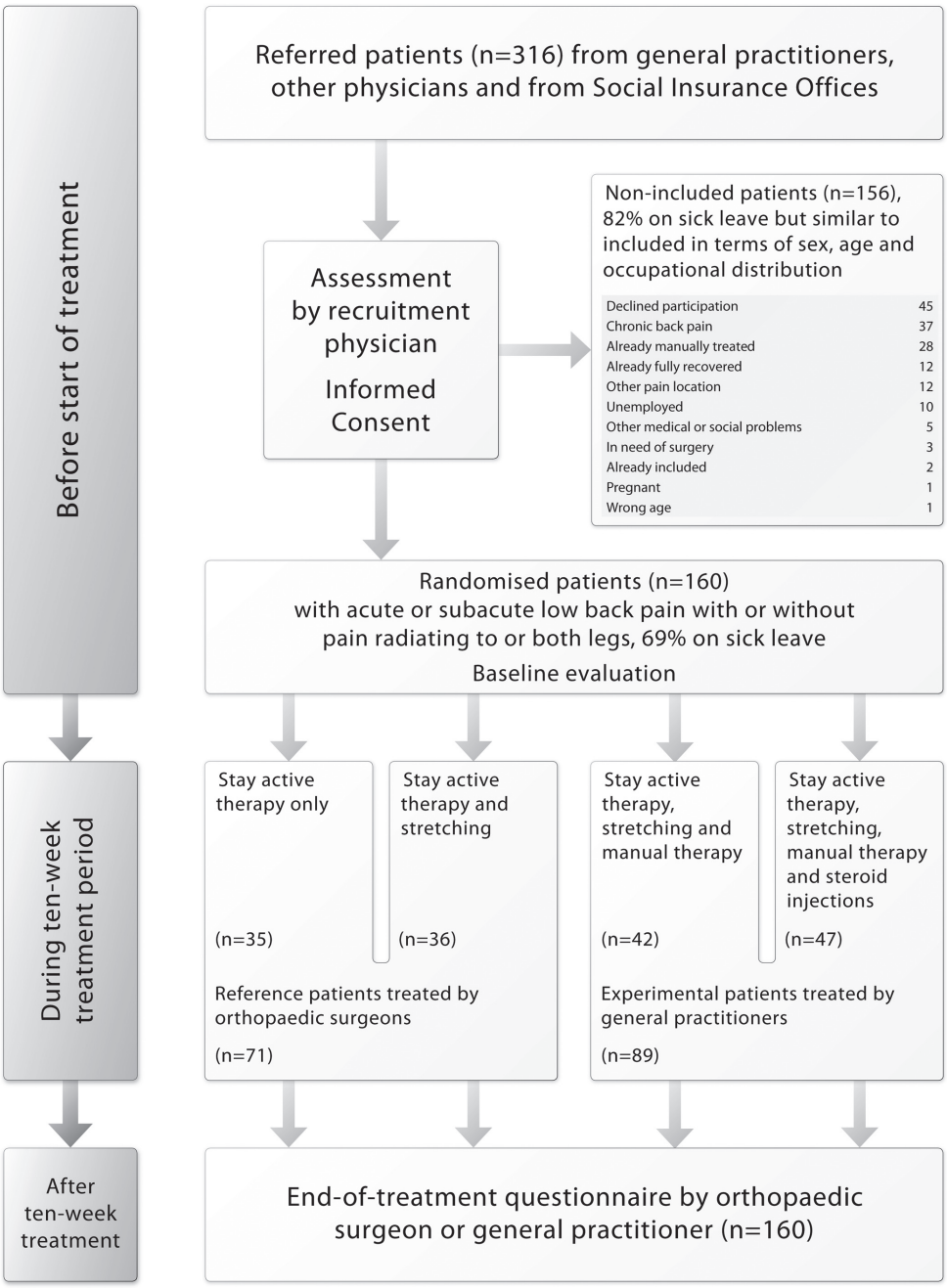

Figure 1. Flow chart of the study population.

The Disability Rating Index instrument, containing twelve disability rating variables, was used to measure function (12). Disability rating variables and pain scores were recorded on 100 millimetrevisual analogue scales ranging from no disability or pain to maximum disability or pain.

The diagnoses used over the ten-week treatment period were recorded on a pre-prepared list of diagnostic alternatives and pain characteristics with an additional open-ended alternative, by the physicians at the end of the ten-week treatment period, Figure 1. The list is identical to the alternatives listed in Table 6. No classification of these labels was done, the full dataset is presented in Table 6.

In addition, to broaden the evaluation of diagnostic assessment, the patient records were scrutinized for the whole ten week treatment period and all diagnoses were recorded verbatim. First diagnosis, i.e. the first occurring diagnosis for each patient was analyzed separately since the following diagnoses for each patient may not be independent of previous diagnoses. No fixed intervals or time points were used. The visits were scheduled to suit the clinical needs of each patient.

The Quebec Task Force classification (QTF) (13) was used to group the diagnostic labels into objective categories, Table 1. It is a wellknown and previously evaluated system, it is independent of therapist speciality or occupation and there is scientific support for the prognostic value for presence of pain radiating into the legs (14,15). The classification is based on criteria such as pain radiation, whether surgery has been performed, and radiological test results. If diagnoses could be placed into more than one category, the category with the highest number was used. Diagnoses unrelated to low back pain were included in category eleven. Application of the QTF diagnostic classification was limited to data from patient records, questionnaire data were not enough detailed to allow QTF system classification.

Diagnoses within QTF group 1 were divided into three subgroups. The first group consisted of nonspecific labels, the second group of "dysfunctions" in the sense used by manual therapists (16,17), and the third group of all other specific labels (18). The diagnostic labels assigned by the study physicians are shown in Table 1.

Statistical analysis

Data were analysed with the SAS and JMP programme package (19,20). Partial non-response (missing data in questionnaires) was less than 1%. Two reference and four experimental patients had no diagnoses in their medical records. Summary statistics, such as proportions, means and measures of dispersion, were computed with standard parametric methods. Differences between the groups in continuous variables were tested with Student's t-test or analysis of variance, while discrete data were tested with the standard chi square test. Adjustment for possible confounding caused by differences between the groups in mean number of reported diagnoses did not affect the results. For this reason only non-adjusted data are presented. Variation between and within physician groups was measured with chi-square estimates. Only two-tailed tests were used. P-values less than 5 percent were regarded as statistically significant.

Table 1. Classification system of the Quebec Task Force (QTF) on Spinal Disorders and labels used by physicians. Labels within class 1 are sub-grouped

Class	QTF label	Labels used by physicians
1	Low back pain without radiation of pain below the gluteal folds, no neurological signs	*Non-specific labels:* low back pain; low back insufficiency pain *Specific manual diagnoses:* lumbar dysfunction; pelvic dysfunction; thoracic dysfunction *All other specific labels:* discogenic pain; muscular pain**;** short muscles; iliolumbar ligament pain; hip joint pain; sacroiliitis; lumbosacral transitional vertebra; herniated disc
2	Low back pain with radiation of pain not beyond the knee, no neurological signs	Muscular inflammation; piriformis syndrome/tendalgia/ tendinitis; pelvic dysfunction; sacroiliitis; trochanteritis
3	Low back pain with radiation below the knee, no neurological signs	Low back and ischiadic pain; low back and radiating leg pain; low back pain with specified nerve root syndrome; specified nerve root syndrome only; disc herniation with or without specified disc level or nerve root; spondylosthesis; sacroiliac pain; piriformis tendalgia
4	Low back pain with lower-extremity radiation and neurological signs	Low back and ischiadic pain; low back and radiating leg pain; low back pain with specified nerve root syndrome; specified nerve root syndrome only; disc herniation with or without specified disc level or nerve root; pelvic dysfunction; sacroiliac pain; trochanteritis
5	Presumptive compression of nerve root based on radiographic tests (e.g. spinal instability, fracture)	–
6	Compression of nerve root confirmed by imaging tests (e.g. computerized tomography, magnetic resonance imaging)	Low back and ischiadic pain; low back and radiating leg pain; disc herniation with or without specified disc level or nerve root; pelvic dysfynction
7	Spinal stenosis confirmed with radiologic tests	–
8	Post surgical status, <6 mo following surgery	–
9	Post surgical status, >6 mo following surgery (asymptomatic, symptomatic)	Low back pain, postoperative status; low back pain with specified nerve root syndrome; disc herniation or scar tissue with or without specified disc level or nerve root; pelvic dysfunction
10	Chronic pain syndrome, treatable active disease has been ruled out	–
11	Other diagnoses (e.g. metastases, visceral disease, compression fracture, spondylitis)	Abdominal pain; non-steroid anti-inflammatory drug allergy; prostatitis

Table 2. Demographic data and medical history at baseline in the four treatment groups. 95%CL=95% confidence limits

	Orthopaedic surgeons		General practitioners		Diff GPs'-Orthop. surgeons' patients	
	stay active only	stay active, stretching	stay active, stretching, manual therapy	stay active, stretching, manual therapy, injections	difference	95%CL
Age, years	42	42	42	41	0.5	–2.2;3.2
Females, %	37	33	48	53	15.4	0;30.9
Body Mass Index	24.6	25.8	25.9	24.5	0	–1.2;1.2
Smokers, %	46	42	43	47	1.3	–14.4;17.0
Mandatory education only, %	29	31	31	28	–0.4	–14.0;14.8
Heavy or very heavy occupation, %	54	44	48	51	0.1	–15.7;16.0
Regular physical leisure time activity, %	31	33	19	19	–13.3	–26.8;0.2
Previous LBP history						
Previous similar LBP, %	77	89	88	81	1.1	–10.5;12.8
Same location, %	96	81	84	97	2.7	–8.0;13.4
Same character, %	82	74	65	82	–4.3	–19.3;10.8
Time since first acute period, yrs	10	7	10	11	1.7	–0.7;4.2
Number of episodes	5	3	4	4	–0.3	–1.8;1.2
Mild chronic pain last two yrs, %	33	34	43	40	7.4	–9.3;24.2
Mean VAS in chronic complaints, mm	23	21	23	20	–0.8	–7.6;6.1
X-ray because of LBP, %	51	39	29	36	–12.5	–27.7;2.7
Hospital admission for LBP, %	6	3	7	9	3.6	–4.0;11.3
Lumbar surgery, %	0	3	5	2	2.0	–3.0;6.9
Sick-leave due to LBP >1 mo, %	14	17	12	15	–2.0	–13.1;9.1
Current LBP episode						
Mean duration of episode, days	25.5	35.1	24.6	25.1	–5.5	–13.6;2.6
On sick-leave at baseline, %	77	56	69	72	4.6	–10.0;19.2
Pain last 24 hours, mm	55	49	53	57	2.5	–4.9;9.9
Pain last week, mm	51	58	60	48	–1.0	–7.9;5.8
Disability Rating Index	57	52	60	61	6.1	–0.1;12.4
Well-being score	68	71	71	69	0.7	–3.0;4.3
Complaint score	9.6	9.3	9.2	8.5	–0.6	–2.0;0.8

Results

Baseline data

Patient characteristics and medical history are shown in Table 2. There were no significant differences among the four treatment groups, or between the two groups treated by GPs and orthopaedic surgeons, respectively, regarding demography, previous low back pain infirmity, symptom duration, or sick leave during the two years before the start of the study. The pain score, disability rating index, and quality of life scores were similar in the groups. Findings at the baseline physical examination are summarised in Table 3. Restricted mobility, and local and radiating pain caused by movement were frequent in all groups, with no significant differences.

Table 3. Physical examination findings at baseline. 95%CL=95% confidence limits

	Orthopaedic surgeons				General practitioners					
	stay active only		stay active, stretching		stay active, stretching, manual therapy		stay active, stretching, manual therapy, injections		Differences between GPs' and Orthopaedic surgeons' patients	
	n	%	n	%	n	%	n	%	difference %	95%CL
Lameness due to low back pain, %	9	26	14	40	15	37	17	37	3.9	–11.3;19.1
Severe observed pain influence, %	0	0	1	3	1	2	2	4	5.9	–8.9;20.7
Observed movement difficulties or pain scoliosis	4	11	3	8	6	14	7	15	4.7	–5.7;15.2
Flattened lumbar spine, %	8	23	8	22	7	17	11	23	–2.3	–15.2;10.6
Lumbar tenderness, %										
Interspinal	13	37	19	53	20	48	25	53	5.5	–10.3;21.3
Paravertebral	16	46	20	56	20	48	26	55	1.0	–14.8;16.8
Tender sacroiliac joint, %	12	34	10	28	10	24	17	36	–0.6	–15.2;13.9
Trendelenburgs sign positive	15	43	16	44	18	43	22	47	1.3	–14.4;17.0
Restricted flexion	16	46	12	33	16	38	18	38	–1.2	–16.6;14.2
Restricted Extension	24	69	17	47	27	64	26	55	1.8	–13.8;17.4
Restricted Side-bending	27	77	17	47	28	67	30	64	3.2	–12.0;18.4
Local pain caused by flexion	29	83	26	72	36	86	38	81	5.7	–6.8;18.1
Local pain caused by extension	26	74	19	53	32	76	32	68	8.5	–6.1;23.2
Local pain caused by side-bending	29	83	25	69	36	86	39	83	8.2	–4.2;20.6
Pain radiating to uni/bilateral leg from flexion	25	71	22	61	28	67	29	62	–2.2	–17.2;12.9
Pain radiating to uni/bilateral leg from extension	20	57	15	42	21	50	23	49	0.1	–15.7;16.0
Ipsilateral leg pain on side-bending	19	54	13	36	20	48	22	47	2.1	–13.6;17.9
Contralateral leg pain on side-bending	17	49	11	31	21	50	21	45	7.8	–7.9;23.4
Positive straight leg raising test (SLR), %	5	14	11	31	14	33	13	28	7.8	–6.2;21.8
Pseudoradicular pain, %	1	3	3	8	3	7	3	6	1.1	–6.6;8.8
True radicular pain, %	5	14	10	28	13	31	13	28	8.1	–5.7;21.8
Superficial sensitivity altered, %	3	9	8	22	11	26	9	19	7.0	–5.5;19.4

Table 4. First diagnoses from medical records classified according to Quebec Task Force on Spinal Disorders. Class 1 also divided into subgroups. Numbers are not necessarily mutually exclusive. n.s.=not significant. n= number of patients

		Orthopaedic surgeons		General practitioners		
		n	%	n	%	p
Distribution over Quebec Task Force Classes (n=154)						n.s.
1	Pain with no radiation	47	68.1	60	70.6	
2	Pain with proximal radiation	4	5.8	8	9.4	
3	Pain with distal radiation	8	11.6	4	4.7	
4	Pain with radiation to lower limb and neurological signs	5	7.3	9	10.6	
5	Presumed nerve root compression, after X-ray	0	0	0	0	
6	Confirmed spinal nerve root compression	2	2.9	2	2.4	
7	Spinal stenosis	0	0	0	0	
8	Post surgical status, 1–6 months after intervention	0	0	0	0	
9	Post surgical status, > 6 months after intervention	1	1.4	2	2.4	
10	Chronic pain syndrome	0	0	0	0	
11	Other diagnoses	2	2.9	0	0	
Diagnoses within Quebec Task Force Class 1 (n=107)						<0.0001
	Low Back pain, Low back insufficiency	39	83.0	12	19.0	
	Dysfunction	0	0	47	74.6	
	Discogenic pain, hip pain, muscular pain, sacroiliitis	8	17.0	4	6.4	

Diagnoses from patient records

The average number of diagnoses during the ten-week follow-up period was 1.3 in the reference groups and 2.4 in the experimental groups ($p<0.0001$). When the first occurring diagnosis from patient records was classified according to the Quebec Task Force classification, class 1 (pain with no radiation) diagnoses were the most common and there were no significant differences between the two physician groups, Table 4. The first diagnosis was typically assigned 2–3 days after inclusion, with a mean time after inclusion of 3.4 days, with no differences between physician groups. The diagnostic patterns were similar when all subsequent diagnoses for each patient were taken into consideration, Table 5.

However, within the class 1 diagnostic group there were major differences in the physicians' choice of diagnostic labels ($p<0.0001$). The general practitioners mainly used "lumbar dysfunction" and "pelvic dysfunction" while the orthopaedic surgeons predominantly used a non-specific low back pain label. The results for all diagnoses from patient records were similar to those for the first diagnoses, Tables 4 and 5. For first diagnoses in the class 1 diagnostic group the between-physician group variation was large (chi-square 79.2, 2 degrees of freedom) compared to that of the within-physician group (5.8 and 3.4, 2 degrees of freedom), indicating consistency within physician groups but not between groups. For all diagnoses the corresponding chi-square values were 108.5, 3.1 and 12.2.

Table 5. All diagnoses from medical records classified according to Quebec Task Force on Spinal Disorders. Class 1 also divided into subgroups. Numbers are not necessarily mutually exclusive. n.s.=not significant. n= number of patients

		Orthopaedic surgeons		General practitioners		
		n	%	n	%	p
Distribution over Quebec Task Force Classes (n=154)						n.s.
1	Pain with no radiation	54	58.1	142	66.0	
2	Pain with proximal radiation	9	9.7	18	8.4	
3	Pain with distal radiation	17	18.3	18	8.4	
4	Pain with radiation to lower limb and neurological signs	6	6.4	22	10.2	
5	Presumed nerve root compression, after X-ray	0	0	0	0	
6	Confirmed spinal nerve root compression	3	3.2	6	2.8	
7	Spinal stenosis	0	0	0	0	
8	Postsurgical status, 1–6 months after intervention	0	0	0	0	
9	Postsurgical status, > 6 months after intervention	1	1.1	8	3.7	
10	Chronic pain syndrome	0	0	0	0	
11	Other diagnoses	3	3.2	1	0.5	
Diagnoses within Quebec Task Force Class 1 (n=115)						<0.0001
	Low Back pain, Low back insufficiency	42	77.8	29	19.2	
	Dysfunction	0	0	111	73.5	
	Discogenic pain, hip pain, muscular pain, sacroiliitis	12	22.2	11	7.3	

There were also differences between physician groups for diagnoses indicative of pain radiation down into the legs. However, numbers were small and the results inconclusive. In all patients with pain radiating only into the thigh, labels of "piriformis syndrome" or "trochanteritis" were used. In patients with radiation below the knee "dysfunction"-labels decreased while non-specific labels with or without indication of a specific nerve root were more common.

Reported diagnoses from physician questionnaires at end of treatment period

The average number of diagnoses for the ten-week follow-up period was 1.6 in the reference groups and 1.9 in the experimental groups (p=0.05). In half of the reported diagnostic categories there were significant differences, Table 6. One third of the experimental patients received a diagnosis of "Pseudoradicular pain", while this label was given to only two reference patients. Since the number of verified herniated discs reported by questionnaire also included herniated discs known before the study start, it was larger than the number from the patient records.

Diagnostic work-up

Orthopaedic surgeons ordered twice as many X-ray examinations than GPs, p<0.0001, Table 6. Use of advanced imaging was not significantly different. A her-

Table 6. Diagnoses and reported work-up from physician questionnaire among 160 patients. Numbers are not mutually exclusive. n.s.=not significant. n= number of patients

	Orthopaedic surgeons		General practitioners		
	n	%	n	%	p
Reported diagnoses during the ten-week study period					
Lumbago (Low back pain without specification)	52	73.2	82	92.1	<0.005
Low back insufficiency pain	11	15.5	8	9.0	n.s.
Pseudoradicular pain	2	2.8	27	30.3	<0.0001
True radicular pain	14	19.7	16	18.0	n.s.
Suspected lumbar disc herniation	16	22.5	17	19.1	n.s.
CT/MRI verified disc herniation	4	5.6	10	11.2	n.s.
Thoracic pain	3	4.2	13	14.6	<0.05
Miscellaneous diagnoses*	12	16.9	5	5.6	<0.005
Diagnostic work-up					
Lumbar X-ray	40	56.3	22	24.7	<0.0001
CT, MRI, myelography	16	22,5	12	13.5	n.s.

* Contains: discogenic pain, facet-joint pain, hyper-reactive lower back, muscular pain, morning stiffness, piriformis muscle tendinitis, postoperative herniated disc pain, relapsing coccygeal pain after fracture, sacroiliitis, spinal stenosis, spondylosthesis

niated disc was verified in 46% of the neuroradiological examinations among GP patients, as compared to 33% among the orthopaedic surgeon patients, a non-significant difference. Among the GP patients eight (9.1 %) were referred to an orthopaedic surgeon for surgical evaluation.

Discussion

The diagnoses used for local low back pain were assigned differently by GPs and orthopaedic surgeons, and the assignments were consistent within each professional group. For local pain GPs predominantly used the label “dysfunction”, while the surgeons primarily used non-specific labels. In comparison with number of cases with radiologically verified herniated discs the orthopaedic surgeons were more likely to use the label “(suspected) herniated disc” and less likely to use the label “pseudoradicular pain”. They also used more diagnostic imaging than the GPs.

The study was performed within the framework of a clinical trial. The design may cause some limitations, such as a small number of physicians and the fact that physicians participating in a clinical trial may be assumed to have a more than average interest in the subject studied, limiting generalisability of the results. However, also the alternative design, to let a larger group of physicians examine the same patients, has limitations. First, such a design can only provide cross-sectional data, i.e., the patients are usually seen only once, which means that diagnoses under these

conditions are preliminary and not based on observation over time or clinical work-up. Secondly, repeated examinations of the same patients by several physicians may affect the results. The design chosen for this study is therefore most probably providing more reliable and clinically valid results than alternative designs.

Use of a questionnaire with listed diagnosis alternatives may to some extent have affected the labels chosen. However, the similarity in results from questionnaire data and medical records where the wording was spontaneous indicates that the potential bias due to questionnaire use is small. The similarities between the groups in baseline data including demography, previous and current low back pain and the similar distribution across QTF diagnostic groups suggests that the groups were similar in all diagnostically relevant aspects. The differences in diagnostic labelling between the two physician groups are therefore most probably not due to differences between the patient groups. We have therefore no reason to believe that the results are affected by dissimilarities between groups or by methodological bias.

Swedish GPs are trained by orthopaedic surgeons during their undergraduate training, including their management of LBP. Therefore the diagnostic assessment in the two groups is influenced by the same training but applied to different patient populations. Orthopaedic surgeons normally have no training in manual therapy, this training is more common among GPs.

Although variations in diagnostic labelling have been assumed, we have not found any reports of studies with controlled design on this subject. However, the validity of many diagnostic labels versus the true underlying cause of the condition has been questioned. (21–24) The debate continues and cannot be easily resolved since there is no accepted gold standard for low back symptoms and diseases (25,26). According to some authors dysfunctions are the most common causes of low back pain (2) and use of such labels is widespread among manual therapists (16).

However, within the medical community, the existence of dysfunctions is controversial since the assumptions about underlying pain mechanisms are regarded as insufficiently evidence-based (21,25,27) Bogduk called them "metaphors, with no established biological correlates" and stated that labels specifying an anatomical cause of pain cannot be established without invasive procedures or radiological analyses (24,28).

Given this debate it may be concluded that for the time being there are no absolutely right or wrong diagnostic labelling alternatives among those used in this study. A practical way of handling this dilemma is so called diagnostic triage, where patients are classified into the three groups, suspected serious underlying disease, signs of nerve root pain, and all others with so-called non-specific pain (21). Another way of dealing with this problem has been proposed by Blomberg (17).

The more frequent suspicion of herniated discs by the orthopaedic surgeons in our study might be caused by a focus on true radicular pain since their primary task is normally to select patients for surgery. One possible reason for the difference in use of diagnostic imaging may be that training in manual therapy gave the GPs a

basis, with a larger diagnostic and therapeutic toolbox, to continue the treatment further without resorting to diagnostic imaging, consistent with the favourable natural history of low back pain, the demonstrated effectiveness of the experimental treatment to decrease pain and disability and that the GPs saw their patients more often and could assign a larger number of diagnoses to them (9).

The choice of diagnostic labels may have effect on the further course of the condition. When stay active management is the goal caution must be exercised in relation to labels both of dysfunctions and of specific pathology so that these are not used as excuses for inactivation and cause fear avoidance and inappropriate illness behaviour (21,29–31). Specific diagnoses such as "herniated discs" on worker compensation certificates have been shown to indicate poorer return to work prognosis than non-specific labels (18). The more valid but less descriptive non-specific terms used by the orthopaedic surgeons may lead to lower expectations from patients on the effectiveness of treatment since they send the message that the physician does not know what is wrong (24). To the extent that the different use of diagnostic labels is an integral part of different treatment strategies the choice could be important since it may be linked to positive results from manual treatment both in terms of choice of treatment and by direct effects of the labelling itself.

It may be valuable to consider the influence of physicians' diagnostic labels on choice of treatments in future trials on low back pain. Also, even if it is not explicitly stated, physiotherapists' choices of treatment are determined by their own evaluations of and their diagnoses of the patients' condition. This was not studied in this trial but may also be valuable in future studies. Similarly, a possible causal connection between diagnostic labelling and prognosis should be studied through randomised controlled trials with sufficiently wide inclusion criteria (32).

Conclusions

There were differences in diagnostic labels used by general practitioners trained in the manual therapy system and those used by orthopaedic surgeons in patient groups similar at baseline. Indications of different use of radiological examinations were also found.

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