

Review

## Radiological examination in low back pain patients: Anxiety of the patient? Anxiety of the therapist?

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### Abstract

A review of the recent literature shows that guidelines on the management of low back pain (LBP) have little impact on the use of radiological imagery. Among the factors which might account for the use of radiological examination, a review of the literature points to some that refer to the patient, others to the clinician and still others to the therapeutic interaction. This leads one to question the importance of radiological examination for both the patient and the physician. The matter at stake in this review is the relationship that may exist between this type of examination and the patient's and/or the physician's anxiety. If these aspects are associated or causally related, this relationship can be two-sided and is thus susceptible to affect the patient, the physician, or both. Some possible keys which emphasize the central role of the therapeutic relationship in this predicament are also reviewed.

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### 1. Introduction

Since the publication of the first guidelines for low back pain in 1994 [1], various other guidelines (a recent review lists 17 of them [2]) have been issued promoting markedly similar recommendations. Most of them advocate the use of diagnostic triage (by distinguishing non-specific low back pain (LBP), nerve root pain or specific spinal pathologies), with a thorough case history-taking and a clinical examination in order to exclude “red flags”, a neurological examination, a detailed review of psychosocial factors if there is no improvement, and to avoid radiological imaging in the absence of “red flags”.

However, in everyday clinical practice, adherence to these guidelines is relatively low with regard to diagnostic procedures (history-taking, clinical examination, radiology and specialized consultations) [3]. This raises the question of the reasons which may account for the difficulties to implement these guidelines. As for radiological imaging in particular, the litera-

ture emphasizes the extent of these difficulties and suggests a role for the anxiety of the patient but also for the anxiety of the therapist.

A recent review indicated that the proportion of radiological imaging which was requested because of LBP and could be considered as non-necessary according to clinical criteria was as high as 50% [4]. An Italian study also pointed to an over-utilisation of radiographies for acute LBP [5]. A study including more than 3 million patients consulting emergency wards in the USA because of LBP showed that 17.8% had been referred for imaging in the absence of “red flags” [6]. Similarly, the comparison of the number of MRI performed in the USA in LBP patients in 1994—i.e. when the guidelines of the Agency for Health Care Policy and Research (AHCPR) were published—and in 1996 demonstrated an almost total stability [7,8].

Various studies report on an excessive or inappropriate use of radiological imaging as compared to the guidelines; however, the possibility of a “perverse” effect of the use of these guidelines has been mentioned as well. A retrospective study including 963 acute LBP patients showed that 13% of them had been referred for imaging at the time of the first consulta-

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tion; if the recommendations of the AHCPR guidelines had been applied, 44% of the patients would have been referred for imaging, which would have meant a 238% increase [9].

Other studies investigated the practitioners' theoretical agreement with the contents of the guidelines and suggested reasons for disagreement, at least concerning some specialists. In a study carried out in the Netherlands and including 66 neurosurgeons, only 37% of the responders totally agreed with the contents of their national guidelines regarding the management of sciatica. A control of the prescriptions made by these same specialists in a sample of 156 patients nonetheless confirmed an effective use of the guidelines in their clinical practice [10].

Randomised studies have shown that a lumbar radiography was associated with increased patient satisfaction [11]—which can be independent from functional restoration or decrease in pain intensity [12]; others have also noted the possibility that these examinations may reassure the physicians [13,14]. Whilst patient expectations regarding radiological imaging can be wide-ranging, Atlas and Deeyo [15] stressed that these expectations rarely provide a sound indication for this type of examination and emphasized the importance of the role of the physician in eliciting these expectations and devising the responses which can be given.

Thus, amongst the reasons which may contribute to the use of radiological imaging, some pertain to the patient, others to the clinician, and still others to the therapeutic relationship; this leads to question the importance of these exams for both the patient and the physician. An extensive review of the implications of radiological examination from the standpoint of their diagnostic value or their economic impact would be beyond the scope of this article. This article addresses the question of the relationship which may exist between radiological examination and the anxiety of the patient and/or the physician. Theoretically, if there were an association or a causal relationship between these two variables (anxiety and radiological exams), it could be two-sided and affect the patient or his/her physician, or both.

## 2. The patient's point of view

In the last decades, the necessity of taking into account the patient's point of view in its multiple aspects has been increasingly acknowledged as a cornerstone of the understanding of various biopsychosocial characteristics and processes which have an impact in the management of the disease, and particularly of chronic pathologies.

Knowing the patients' point of view about the qualities they expect in their doctors seems an obvious issue; however, studies dealing with the "optimal" medical profile frequently used the point of view of the physicians themselves regarding what this profile should be. Conversely, Schattner et al. [16] listed the opinions of 445 in- and out-patients suffering from various pathologies. A set of 21 qualities pertaining to three domains (professional experience and quality of care, patient-centred approach, autonomy of the patient and attention to his/her preferences and rights) was submitted to the patients; they were

asked to choose the four qualities they considered most important and would like to meet in their own doctor. Results mainly showed that the most valued qualities referred first to the patient's autonomy and then to the physician's professional experience. Similarly, a systematic review based on quantitative and qualitative studies demonstrated that LBP patients display very clear expectations regarding diagnosis, recommendations and pain relief. Furthermore, patients request to be involved in the decision-making process [17].

A qualitative study investigated the importance and usefulness of radiological imaging in 93 patients aged 14–91 referred by their general practitioner for imaging of the lumbar spine. The results indicated that three quarters of them (72%) considered radiological imaging as "very important". This proportion was significantly higher in men (85 vs. 65%;  $P = 0.04$ ), in patients with a poor evolution and in those for whom a referral for imaging was inadequate with regard to the guidelines (81% vs. 51% in patients with known indications for imaging;  $P = 0.01$ ). The way patients assessed the importance of radiological imaging was associated to various clinical and anamnestic characteristics (in particular symptom duration or intensity, presence of trauma, or a personal or family history of cancer or of rheumatic diseases). The responses of the patients also stressed the presence of a relationship between their representations of the importance and usefulness of radiological imaging on the one hand and a need for emotional support from the physician, uncertainty or anxiety concerning pain and its consequences as well as the need for a precise diagnosis on the other. Moreover, the analyses of the interviews underlined the existence of beliefs related to a better performance of radiological examination as compared to a clinical evaluation with regard to expected consequences in terms of both diagnosis and treatment [4]. A French study on lumbar CT-scan also showed that patients tend to consider imaging as more reliable than the physicians' clinical diagnosis, be they general practitioners or specialists. This study underlined the importance of imaging for the patients, but also their ambivalence. Indeed, it showed that the vast majority of the patients considered that they ought to have undergone radiological imaging at an earlier stage of the treatment even though many of them (56%) believed that such an examination would not have modified their treatment. A similar proportion of the patients expected to be reassured by CT-scan [18].

The patients' preference for this type of examination plays a role in the use of radiological imaging. In a study including 522 LBP patients and 615 patients suffering from respiratory diseases, patients were asked to rate the necessity of a radiological examination on five-point Likert scales (ranging from "very necessary" to "not at all necessary") in four conditions: LBP, cough, knee pain and swelling of the knee. Scores were added and linearly transformed on a 0–100 scale for the three symptoms which did not concern the patient. While multivariate analyses indicated that the use of radiological examination was significantly increased in patients presenting with clinical characteristics such as an important functional impairment due to pain (3rd and 4th quartiles) and osteoporosis, it also showed that this use was significantly increased in patients expressing a

high degree of agreement with the necessity of a radiological examination (4th quartile) [19].

These studies raise the question of the reasons underlying the importance patients confer to radiological examination. Their results emphasize the role of this examination in the objectivation of pain, and their capacity to explain and justify the causes of pain. In the biomedical model, the anatomical understanding of the body is based on two postulates which inform both the medical and the lay understanding and thus shape a common universe of explanation: On the one hand, the interior of the body corresponds to the visual images one has of it and these images are objective, showing the body as it really is; on the other hand, there are objective norms which allow us to identify ‘normality’ and ‘deviance’ [20,21]. In this model of the anatomical body, what is not “in the body” is “in the mind” and visualising the symptoms—by means of imaging techniques in particular—thus gains a unique importance: to see into the body should indeed allow to confirm, normalise, and thus legitimise the symptoms. Hence the classical biomedical model sets the premises of a view of the body as a repairable machine in which damaged parts might be replaced or at least fixed [22]. This reference to a body-machine can create unrealistic expectations in the patients as well as in the therapists and thus draw them into everlasting complementary, sometimes invasive, investigations which most often do not allow to reach the expected goal, namely to objectify the origin of pain. This search for a rational explanation, further stimulated by the “magical” appeal of the technological means of investigation, can trigger important misunderstandings or even the break up of the therapeutic relationship—prompted by the impossibility to reach this goal [23,24]. Furthermore, radiological examination can have consequential negative effects for the patient in terms of anxiety and of dependence with regard to treatment and therapists but also in terms of conviction to be diseased. Yet fear of being diseased can sometimes be more handicapping than disease itself [25]. This raises the question of the possible “adverse effects” of radiological imaging. Hollingworth et al. [26] suggested that MRI might contribute to the decrease of the subjective health status perception when the radiological examination shows no objective cause of pain, for example.

### 3. Role of the “clinician” factor

Taking into account the role of the therapist raises the issue of the transmission of scientific knowledge but it also brings up the question of the implementation of this knowledge in the clinical practice. Van Tulder et al. [2] analysed the quality of the guidelines for the management of acute LBP patients and pointed to numerous shortcomings, some of which referred to this implementation. More than half of the guidelines analysed in this systematic review included no pilot study in the “target” population, did not take into account the patients’ preferences, the possible organisational problems or the financial implications.

Various techniques have been used to investigate the attitudes regarding diagnosis and their implementation. Cherkin

et al. [27] surveyed these attitudes in 1100 physicians from different specialties, using vignettes describing LBP cases. This study revealed varying attitudes according to the physicians’ specialties: neurologists and neurosurgeons referred acute or chronic LBP patients twice more for imaging than the other specialists whereas physiatrists and neurologists used electromyography three times more often, and rheumatologists tended to ask for more laboratory exams. As for the emergency physicians, they asked for a high number of complementary exams and orthopaedic or neurosurgical consultations as compared to the present evidence-based knowledge [28].

Other studies carried out the same type of comparisons using “standardised” patients, i.e. volunteers trained to present with a specific clinical profile. In a study from Quebec, 108 physicians—general practitioners from private practices, teaching hospitals or residents and residents in internal medicine—made 276 consultations without knowing that they were dealing with “standardised” patients trained to mimic hip arthrosis with or without gastric problems due to NSAIDs. For a same case, costs ranged from \$21 to \$665 according to the physician and to the exams, referral to specialised consultations and prescribed medication. Differences were significant only for the cases with gastric problems. The small percentage of physicians (12.5%) who referred to a specialised consultation after the first visit was a major determinant in the cost/case differences [29].

These studies raise the question of the possible influence of the physicians’ or patients’ “objective” characteristics. Results from studies that have examined the divergences between male and female physicians are equivocal. One study indicated that female physicians referred more often for imaging than their male counterparts, whatever the gender of the patients [30]. Conversely, the results from another study showed that female physicians used less complementary exams at the first visit. This effect of the gender variable was no longer significant in subsequent consultations. Moreover, women and HMO (Health Maintenance Organisation) members were less susceptible to be referred for imaging at the first visits [31]. In the aforementioned study using “standardised patients”, the patient’s gender (for a similar clinical presentation), the physician’s gender or the interaction between both variables had no significant influence on the costs/case [29]. In a study including 182 general practitioners or internists, Franks et al. [32] evaluated the role of the factors which influence the physician’s decision to refer the patient to a specialist. Results showed that the role of factors related to the psychological attitude of the physician (e.g. attitudes towards risk and psychosocial orientation) is less important than those of factors linked to the patient or to the physician’s practice (e.g. age, gender, medical specialty, number of years of practice, type of practice or of patients), at least in the North American context of this study.

The problem of uncertainty and the anxiety that may be related to this uncertainty seems to be involved in the use of radiological imaging. Espeland and Baerheim [33] carried out a qualitative study aiming to investigate the factors which influence the decision to refer a low back patient for imaging. A dimension referring to the physician’s anxiety emerged from

content analysis, clustering factors such as lack of time, concerns about legal consequences, fear of missing a severe pathology or feeling to lack sufficient clinical abilities to refrain from referral for imaging. In the same study, physicians have conversely mentioned the risk of uncertainty that radiological imaging can induce in the patients and in their physicians as well: some physicians may feel uncertain with regard to the degenerative findings evidenced in many radiological exams and wonder whether they are able to explain the patients' symptoms. These uncertainties may be conveyed to the patient and thus increase his/her anxiety [33].

This attempt to decrease uncertainty in the patient and/or in the therapist by means of radiological imaging or of other resources does not exclusively concern LBP patients. A study investigating satisfaction and evolution in patients suffering from ankle trauma showed that referral for imaging at the first visit did not lead to significant differences in terms of patient satisfaction or improvement although the majority of the physicians (78%) considered that patient expectations had influenced their decision of referral for imaging [34].

#### 4. Interaction between both parties

Patients' "unvoiced requests" seem to play an important role: such requests are indeed associated with less symptom improvement and render the consultation more difficult for the physician [35]. Another study from the same research group confirmed these findings and showed the importance of the refusal to carry out complementary exams in the patient's perception of the attention given to and the satisfaction of his/her expectations. Such a refusal appears to generate much more discontentment in the patients than the refusal to provide medical information or to perform a physical examination [35], thus confirming the conclusions of other studies that have shown that patients tend to consider technological investigations as more trustworthy than clinical examination [4,18].

Besides, as noted above, randomised studies have shown that a radiological examination in patients suffering from LBP for less than 6 weeks was associated neither with a functional improvement nor with a decrease in pain severity but with an increase in the physician's workload [11,12]. Conversely, patients who were referred for imaging were more satisfied with treatment than the others even though pain had improved in both groups, with and without radiological examination. Similarly, the results of a study investigating clinical and economical consequences one year after referral for MRI vs. plain X-rays in LBP patients demonstrated that patients referred for MRI expressed higher satisfaction and reassurance rates; however, this was not significantly associated with functional recovery or health-related quality of life improvements [36].

An American study examined the reasons which may account for the absence of impact of an intervention devised to decrease the use of radiological examination in LBP patients. Analysis of the data from focus groups indicated that physicians mainly reported non-clinical factors to explain their refer-

ral for imaging; these factors included the social and symbolic functions that these exams may fulfil when it comes to solve the tensions and conflicts linked to the necessity to satisfy the demands of the patients as well as those of the health organisation. Indeed, referral for imaging may then be perceived as allowing to maintain the therapeutic relationship by showing to the patient that his/her expectations and worries are taken into account in spite of the constraints of the health insurance system and/or the physician's limitations [37].

These exams are thus likely to meet several purposes that are not mutually exclusive. They can be at the crossroads of various clinical and relational questions pertaining to the patient as well as to the therapist and to their interaction. They are not the only possible matter at stake in the therapeutic relationship. A qualitative Australian study showed that general practitioners' attitudes regarding patients' autonomy varied according to the physicians and the various aspects of the treatment [38].

#### 5. Can something be done about it?

Whereas some studies illustrated the absence of impact of interventions aimed at decreasing referral for imaging [7,37], others pointed to the possibility to reduce these exams without negative effects on patient satisfaction. Klein et al. [39] analysed the use of radiological examination and the referral for specialised consultations in LBP patients along with the surgical intervention rates in the 9 months before and 9 months after an education course for primary care physicians. As for radiological exams, referral for CT-scan and MRI decreased by 81% and 28%, respectively. However, the authors did not report on the practical modalities of the intervention; besides, the question remains of how the specificities of each country's health system may influence these aspects and thus of the difficulty to transpose a model from one socio-economic and cultural context to another.

Recent articles underlined the lack of knowledge of patients and therapists regarding the intrinsic risks related to the use of ionising radiations [18,40,41]. It has been suggested that adequate information concerning these risks could contribute to the decrease of referral for imaging in the absence of specific clinical criteria.

A vast amount of data in the field of therapeutic relationship and prevention gives ample evidence that providing information is not sufficient to modify representations, behaviours, or related emotional reactions. The situation is obviously similar in the field of radiological imaging. As for exams where the patient experiences a double anxiety (with regard to the exam itself and with regard to its result) as it is the case with mammography, the use of information videos proved inefficient to soothe both aspects of anxiety [42]. The anxiety related to the exam itself—as it is often the case with MRI—can be easily alleviated using medication [43]; however, this does by no means solve the uncertainty and anxiety that the radiological examination is supposed to address. Far from decreasing uncertainty and anxiety, the examination may on the contrary in-

crease them. Indeed, Barton et al. [44] have demonstrated the deleterious effect that a mammography can have when the interpretation of the images is delayed.

Other studies emphasised the importance of the various components of the doctor-patient relationship in the sorting out of the most adequate ways to respond to the patient's requests in order to maintain or increase his/her trust and thus to improve the treatment and its results [45]. On the basis of the results of their qualitative study, Espeland et al. [4] suggested to take the patient's uncertainty and anxiety into account and to address them individually and specifically, using the clinical examination, information and explanation of symptoms. The role and the importance of clinical examination in the management of any back pain problem need to be emphasised with the patients and with the physicians as well.

Little et al. [46] proposed that the physicians should investigate their patients' expectations in order to avoid misunderstandings. In a one-year follow-up study, Kerry et al. [47] concluded to the absence of impact of an early referral for imaging on the evolution of LBP patients; however, they noted that such a referral could be considered in very anxious patients. Various studies have shown that reassurance provided by the physician, personal interest, providing medical information and careful listening are important components of patient's satisfaction insofar as they go a long way toward meeting the patients' perceived needs. These needs include the reduction of both the cognitive and the emotional uncertainty in a situation of stress and vulnerability. But, as a survey from the American academy of orthopaedic surgery stressed, important divergences may exist between the patients' and the surgeons' point of view regarding the quality of the doctor-patient relationship, especially in terms of listening and availability of time [48].

The way the patient grasps and understands what is happening to him/her as well as his/her expectations regarding himself/herself, the treatment, his/her future are undoubtedly key elements of the evaluation and comprehension of the various cognitive and emotional aspects which may modulate the responses to pain; besides, the importance of the therapist's responses to the patient's requests is far from negligible. The therapeutic relationship is thus a cornerstone as it allows for the discussion and negotiation of the patient's expectations as well as of acceptable and realistic goals so that congruent decisions can be made, taking into account evidence-based knowledge and patient representations and health preferences [49–52].

It may be helpful to remember that the very practice of medicine involves uncertainty at the diagnostic, therapeutic, and prognostic levels; the dilemma between evidence-based knowledge and the implementation of these data in the treatment/management of a given individual case is, so to speak, an integral part of the practice of medicine along with the necessity to cope with the uncertainty intrinsic to scientific data [53].

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