Use of magnetic resonance imaging in musculoskeletal pain in adults in Québec

Part 2

English summary

Une production de l'Institut national d'excellence en santé et en services sociaux

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The complete version of this guidance (in French) is available on the website of INESSS in the *Publications* section.

Équipe de projet

Auteurs

Yannick Auclair, Ph. D.

Brigitte Côté, M. D., FRCPC, M. Sc.

Coordination scientifique

Mariève Simoncelli, B. Pharm., M. Sc.

Mélanie Tardif, M. Sc., Ph. D.

Direction scientifique

Michèle de Guise, M. D., FRCPC, M.M.

Sylvie Bouchard, B. Pharm., DHP, M. Sc., MBA

SUMMARY

Introduction

Musculoskeletal pain (MSP) is a very common health problem that encompasses a vast array of conditions that affect the bones, ligaments, tendons, muscles and joints. It is sometimes severe and can limit physical functioning and significantly impair quality of life. There are many causes of MSP. Medical imaging is one of the different medical examinations for investigating the cause of such pain, and it is often used for this purpose. Magnetic resonance imaging (MRI) is indicated and is the instrument of choice in several clinical situations involving MSP. This diagnostic tool is being granted an increasing number of evidence-based clinical indications. Furthermore, MRI is sometimes used in place of more invasive and more expensive procedures. However, based on observations from various scientific publications, there is currently some debate over the possible overuse of MRI in the diagnosis and follow-up of patients with MSP. The situation in Québec in this regard is not known. It was in this context that the Ministère de la Santé et des Services sociaux (MSSS) asked the Institut national d'excellence en santé et en services sociaux (INESSS) to document this problem and to make recommendations for optimizing the use of MRI in cases of MSP.

To enlighten decision-makers and clinicians about this matter, INESSS is publishing an evaluation in three parts:

i. A description of the overall use of MRI in and a comparative analysis with the Canadian provinces and other, similar territories or countries;

ii. A summary of the guidelines for ordering an MRI for MSP;

iii. A review of the strategies and tools to promote the optimal use of MRI.

Method

Each part uses its own methodology to identify and analyze the evidence and contextual data. These analyses and reviews (systematic and narrative) were carried out in accordance with the prescribed standards of practice. The respective methodologies for the different parts are described in detail in the related documents. Stakeholder representatives (Monitoring Committee) and experts (Advisory Committee) supported INESSS at different stages of its scientific production. Supported by the Advisory Committee, INESSS's project team developed recommendations, which were then submitted to the Monitoring Committee for its opinion. Subsequently, the preliminary report was sent for external scientific review.

Results

Part 1 - Overview of the use of MRI in Québec

The information gathered is largely based on an analysis of clinical/administrative data, notably, those compiled in the databases of the Régie de l'assurance maladie du Québec (RAMQ), the Canadian Institute for Health Information (CIHI) and the Organization for Economic Cooperation and Development (OECD). These data were supplemented by a nonsystematic search of the scientific and grey literature. Several parameters were analyzed, such as the number of examinations performed, the increase in the demand, referring physician specialty, user characteristics, the number of MRI units and their use, human resources and wait times. The key observations are as follows:

- The number of MRI examinations performed in Québec has essentially tripled in the past decade.
- Musculoskeletal pain accounts for a large proportion of the MRI examinations performed in Québec. Nearly half of them target the spine or the extremities.
- The use of MRI in Québec differs according to the users' health and social services region of residence. However, because of the multiple confounding factors, the exact cause cannot be identified. The population, the conditions for access, socioeconomic factors, and differences in service and practice organization are all factors that can influence use.
- The comparison of the MRI examination rate per capita in Québec shows that the provincial rate is slightly lower than the Canadian average. It is more than two times lower than that of other countries, such as the United States, Japan, Germany and France. The literature does not mention an optimal rate.
- The data suggest that the efficiency of the use of MRI units could probably be improved at certain Québec facilities.
- The proportion of inappropriate MRI examinations performed in Québec cannot be determined from the available data.

Part 2 - Clinical indications warranting the use of MRI in musculoskeletal pain

To target the scientific evidence-based recommendations, the researchers performed a review of "appropriate use" imaging guidelines. The selection criteria were as follows: item published between 2010 and 2016; original production; based on a systematic analysis of the literature; a multidisciplinary group of professionals involved in the process; and contained recommendations from a formal expert consensus or a consensus conference. Five guidelines, respectively from the United States, France, the United Kingdom, Australia and Canada, served as a basis for the comparative analysis of recommendations. To ensure that the recommendations were in line with the latest literature, INESSS conducted an exhaustive search of systematic reviews and clinical practice guidelines. The researchers identified 53 relevant publications. They targeted the clinical indications specific to low back pain, neck pain, knee pain and shoulder pain, which, together, account for nearly three-fourths of the MRIs performed for MSP.

Overall, the recommendations pertaining to MRI were, on the whole, homogeneous. There is a consensus that the clinical indications for MRI are based on a proper clinical assessment. Abnormalities on MRI are very common in asymptomatic patients, and any assignment of causality must necessarily be made after a correlation with the clinical signs and symptoms. The recommendations stemming from this work generally reflect the consensus recommendations from international guidelines. The few discordances present were resolved by an additional literature review and by consulting experts. The detailed clinical recommendations are provided in the document pertaining to Part 2. In all, 37 clinical situations are covered.

Part 3 - Strategies and tools to promote the optimal use of MRI

A review of systematic reviews and health technology assessment (HTA) reports was conducted to identify effective tools and strategies to promote appropriate imaging. The information was supplemented by a brief review of the grey literature from comparable jurisdictions to identify initiatives of interest.

Among the organizational strategies evaluated, computerized physician order entry (CPOE) shows a moderate level of evidence in the imaging literature. It can be effective in influencing the appropriateness and volume of imaging orders, especially when certain implementation conditions are present: CPOE in an integrated-care system, CPOE with integrated clinical decision

support, and audit and feedback in the implementation of these tools. Clinical decision support tools, such as appropriateness criteria reminders on a standardized order form, are promising. The implementation strategy depends, among other things, on the clinical setting (hospital or ambulatory) and its level of computerization.

Another organizational strategy identified is the creation of interdisciplinary MSP teams to support primary care physicians. Their role is to triage cases requiring a consultation or specialized examinations, to quickly perform a clinical evaluation of the patient's musculoskeletal system, to facilitate access to effective treatments, and to improve efficiency (including access to advanced imaging). The United Kingdom has built on these teams in its health-care system. They include health professionals with advanced training in MSP (physiotherapists, occupational therapists, primary care physicians with an interest in MSP, and others). These teams have been presented in the literature as a promising avenue for accessing timely and appropriate care and, indirectly, for appropriate imaging, and this strategy should be explored in greater depth.

Financial and governance strategies are mainly illustrated by initiatives in Australia, Ontario and the United States. Financial strategies in the United States and Ontario have been implemented to limit coverage for certain examinations or the fees paid for them. Ontario uses a multifaceted intervention for low back pain that combines the aspect of differentiated remuneration, training for professionals and access to interdisciplinary teams. The impact of this project is being assessed. In the United States, the legal framework and the accreditation of imaging clinics are used to guide referral practice ethics. The objective of the Australian initiative in the area of governance was three-fold: an increase in private imaging resources accredited for coverage by the public plan, a reevaluation of fees to prevent an incentive effect, and more stringent requirements with regard to examination appropriateness and to quality and safety criteria. During the midpoint evaluation, the initiatives aimed at improving imaging order appropriateness proved more difficult to implement than expected and had not yielded the desired efficiency gains, while at the same time, there had been a large increase in the number of examinations due to the opening up of coverage in private-sector imaging.

Implementation strategies aimed at health professionals, such as audit and feedback and educational materials as isolated interventions, have not been shown to be statistically effective in the case of imaging, but they could have a clinically significant impact in multifaceted interventions. Medical education initiatives aimed at equipping physicians to field patient requests have not been found to have an impact on imaging utilization, but initiatives for training physicians to view differently the role of imaging in evaluating a patient are underway and should be followed. In the studies consulted, implementation strategies aimed at patients (media campaign) have not been shown to have a meaningful effect on behaviours in the medium term. Strategies aimed at better informing patients and including them in the approach to ensure appropriateness should be explored.

In the diagnostic area of interest here, the literature supports the implementation of tailored strategies in health-care facilities, and there are several promising avenues: reminders, CPOE and interdisciplinary MSP teams.

Conclusion

The overview of the use of MRI in MSP in Québec confirms that its use is growing. A comparison with other jurisdictions shows that this use is not one of the highest and that there is probably room for increased productivity at certain existing facilities. However, there are no data for commenting on the appropriateness of these examinations. For the vast majority of the clinical

indications, there is a consensus among the international appropriate use guidelines. Experts in Québec are in agreement with these indications, and clinical tools have been proposed. Of the organizational strategies for optimizing MRI appropriateness, the most promising one is CPOE with clinical decision support. Interdisciplinary MSP teams are an avenue of interest that warrants further evaluation. Financial and governance strategies have been put in place in other jurisdictions, but their impact on the efficiency of MRI in MSP varies. In implementation strategies targeting health professionals, the use of audit and feedback has not had a statistically significant impact on optimizing imaging appropriateness in MSP, but quality improvement initiatives that use audit and feedback are promising. The effectiveness of implementation strategies targeting patients should be monitored in the literature and in the ongoing initiatives in Québec. Since the implementation context is of great importance for the effectiveness of strategies and tools, a gradual implementation approach with results monitoring is recommended for the strategies proposed for Québec. Indicators for monitoring appropriateness do exist, but the feasibility of implementing them in Québec depends on the information systems. These indicators should be developed for Québec, together with CPOE.

Recommendations

Several ways to optimize MRI appropriateness were raised during the discussion. In light of the available data and the Québec context, INESSS recommends:

1) That the MSSS:

- Create a standardized MRI order form (with the relevant indications) for musculoskeletal pain for referring physicians;
- Pilot and evaluate CPOE with clinical decision support for imaging (ideally, these systems should permit the use of collected data);
- Explore the assessment of the appropriateness and feasibility of setting up interdisciplinary MSP teams in a continuum of MSP care.

2) That CISSSs and CIUSSSs:

- Institute the means to support quality improvement activities with audit and feedback in their clinical facilities on the appropriateness of MRI in MSP.

3) That the medical federations (the FMOQ and FMSQ) and university programs:

- Set up innovative activities and training and maintenance-of-compet ence tools for musculoskeletal pain in a context of intervention appropriateness.