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Results of an International survey on Spinal Imaging by the ASNR/ASSR/ESNR/ESSR "Nomenclature 3.0" Working Group

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Abstract

Aim: The aim of this manuscript was to determine if there is a need for updating the classification of lumbar disc pathology consensus, "Nomenclature 2.0".

Methods: We did a social media and email-based survey on preferences regarding the use of classification on MR Spine reporting. A 15-question online survey was sent out to members of the ASNR/ASSR/ESNR/ESSR between February and March 2022.

Results: A total of 600 responses were received from 63 countries. The largest number of responses came from Italy and the USA. We found that Nomenclature 2.0 Classification of lumbar disk pathology was largely used by 71.28% of respondents. However, classification on stenosis is used less often, as 53.94% and 60% of respondents do not use any classification of spinal canal stenosis and foraminal stenosis, respectively. Asking which part of Nomenclature is subject to improvement, the majority asked for the implementation of a Structured Report Template even if

58.85% of respondents do not use any template at the moment. 54% routinely use a clinical information questionnaire.

Conclusions: These results highlight the importance of an updated Nomenclature 3.0 version integrating the classifications of lumbar disc disease and spinal canal and foraminal stenosis. Further attention should be made to develop a robust endorsed Structured Report Template.

Keywords

- Spine

- Imaging

- Nomenclature

- Disc

- MRI

Introduction

The nomenclature and classification of lumbar disc pathology consensus, currently at version 2.0[1,2], is a milestone paper, guiding general and subspecialized radiologists for over 20 years. In 2020 "The Lumbar Spine Nomenclature 3.0 working group", a joint task force consisting of members of ESNR (European Society of Neuroradiology)-ESSR (European Society of Muculoskeletal Radiology)-ASNR (American Society of Neuroradiology)-ASSR (American Society of Spine Radiology) was created to evaluate the next update. The first step was to assess the current utilization of 2.0 nomenclature in both academic and private practice settings. A secondary objective consisted of questioning radiologists regarding their perception of the shortcomings of the current classification, which could serve as a guide for future revisions. Finally, we explored the usefulness of developing a dedicated Structured Reporting Template (SRT) and Clinical Information questionnaire.

Methods

An online survey was developed by The Lumbar Spine Nomenclature 3.0 working group", a joint task force composed of members of ESNR-ESSR-ASNR-ASSR on the online software Survey Monkey (SurveyMonkey Inc.). The survey was designed and tested by all authors, and board-certified radiologists, prior to its dissemination. The survey was anonymous and contained a total of 15 questions (Table 1) focused on the preferences of reporting Spine MRI. All questions were designed with multiple-choice answers. It was disseminated via e-mail to all members of The European Society of Neuroradiology (ESNR) and Europeans Society of Musculoskeletal Radiology (ESSR) and more broadly to an international radiologist audience via social media using the author's personal accounts (Twitter, Facebook, LinkedIn) and during the ASSR Annual Meeting in Austin, Tx (USA). The survey was conducted between January and February of 2022. We used a weighted average for each answer choice, calculated for rating scale questions, automatically generated by the SurveyMonkey software.

Results

A total of 600 responses were received from 63 countries. Talking about demographics, the largest number of responses came from Italy (21.87%) and the USA (21.70%) (Figure 1). The most represented age group was 35-44. Neuroradiologists were the large majority (73.46%), followed by general radiologists (18.70%) and musculoskeletal radiologists (7.85%) (Figure 2). The majority work at university hospitals (45.24%), followed by private practitioners (21.37%) and community hospitals (19.43%). Most respondents work in a country where subspecialization is recognized (76.76%). Asking what percentage of work is dedicated to spinal imaging, the average answer was 42%. 64.86% declared to report 51 or more spine examinations each month. 71.28% of respondents routinely use 2.0 nomenclature classification (Figure 3).

When asked which parts of the current nomenclature would they want to be elaborated upon or revised (Question #9) (Figure 4) the majority (25.30%) indicated that the next version should incorporate a standard reporting terminology (SRT) although 58.85% do not currently use structured reports, more illustrations by drawings (7.42%), revision of classification (6.75%) and the glossary (5.56%). 22.60% preferred an update of all the sections, whereas 16.6% had no opinion. Modic or disco-vertebral endplate signal changes classification is largely used by the respondents (74.41%). 53.94% stated that they do not currently use any classification system for spinal canal stenosis (Figure 5a) or foraminal stenosis (Figure 5b) (60%). Similarly, the majority of respondents (62.88%) stated that they do not use a classification system for degenerative disk changes. 54.73% of respondents routinely use a clinical information questionnaire.

Discussion

Spine MR imaging is one of the most common exams performed in radiology practice, primarily due to the large prevalence of degenerative spine disease[3,4] with increasing numbers spine MRI's being performed during recent years[5]. Degenerative spine disease results from a combination of various risk factors, especially genetics, aging, lifestyle and ergonomic factors work, leading to disc and adjoining bone related pathologies. One of the lingering common issues, however, is that in routine clinical practice, the interpretation and description of radiological findings are so nebulous with different terminologies being used to define similar abnormalities[6]. This leads to confusion and unclear reporting[7,8,9]. This is not a recent problem: after the introduction of MRI several working groups tried to define correct terminology, resulting in the "Lumbar Spine Nomenclature", now in its second version since 2014, with the additional involvement of referring clinicians in the redaction of the paper.

The first aim of our survey was to assess the current implementation of this classification, in order to refine and improve a future 3.0 version.
With our survey, we were able to determine the demographics of our respondents and showed that there is a high prevalence of neuroradiologists interpreting spine imaging. Interestingly, most of the respondents work in a country with recognition of Neuroradiology and/or Musculoskeletal Radiology as a subspecialty, spending a substantial time of their clinical work reporting spine imaging. This underscores the importance of our survey.

Although 71.28% of the respondents use of 2.0 Nomenclature, there is still room for improvement in order to increase the nomenclature as a universal reference standard among radiologists and referring physicians. Interestingly, most of the respondents expressed that a specific SRT ideally should be standardized for spine imaging interpretation. This result is notable as in responses to Q14 of the survey, the majority currently do not use a SRT, but they recognize the added value of a clear and concise template (Q9). The respondents to this survey also conveyed that not only do they want guidance in what descriptive words to use but also in

appropriate use: how and where to use them. Furthermore, the responses highlighted the need for updating the drawings and the glossary of standardized terminology.

Other findings of the survey show that the Modic classification is largely used in reporting of Spine MRI, as 74% of respondents integrated this classification in their routine reports. This is important as information from recent years have shown this correlation to chronic low back pain. On the other hand, from the responses we noted that there is a definite need to integrate a standardized classification for foraminal and spinal canal stenosis. Grading of spinal stenosis, including central spinal stenosis[10,11], lateral recess stenosis, and foraminal stenosis[12] is useful not only to harmonize reports but also to stratify patients for potential treatment . The latter is relevant as there is some clinical correlation of spinal stenosis grades with patients' complaints, especially in foraminal stenosis.

Unlike the previous versions, the 3.0 Nomenclature should focus on the harmonization of grading degenerative disc disease. Currently, two grading systems are in wide use: (1) Pfirmann grading[13] and (2) radiology-adapted Thompson grading[14]. However, these should be easy to combine since they use some of the same criteria, namely disc height and T2-signal intensity of the disc. Since there is a plethora of grading systems, choosing an appropriate system is pivotal in acceptance in the radiological community. As with all grading systems, ideally, they should be (1) easy to remember, (2) easy to use with clear and unequivocal criteria and (3) clinically significance. Although more than 50% of the respondents use a clinical questionnaire, further standardization may lead to a better correlation between imaging findings and clinical symptomatology. Efforts should be made to seek advice from referring physicians.

We are aware that the results of this survey may not reflect the enitre radiologic community's needs, especially due to the relatively small number of respondents, but we think that the mixed audience (general, neuro- and MSK radiologist) is a representative sample of the radiologists interpreting spine imaging.

Conclusions

The classification of lumbar disc pathology consensus, "Nomenclature 2.0", is a milestone paper that is currently used in the clinical practice of radiologists reporting spinal examinations. According to the results of our survey,however, this classification would benefit from a 3.0 update, adapted to the needs of radiologists and technological treatment changes and improvements. Efforts for improvement should focus on a robust Structured Report Template, descriptive illustrations, and integration of classification for spinal canal and foraminal stenosis.

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