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A Survey of Anatomical Items Relevant to the Practice of Rheumatology: Upper Extremity, Head, Neck, Spine and General Concepts

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Abstract

Objective. To identify those anatomical items of the upper extremity and spine that are potentially relevant to the practice of rheumatology.

Methods. Ten rheumatologists interested in clinical anatomy who published, taught and/or participated as active members of Clinical Anatomy Interest groups (6 senior and 4 junior), participated in a one-round relevance Delphi exercise. An initial, 560-item list that included 45 (8.0%) general concepts items, 138 (24.8%) hand items, 100 (17.8%) forearm and elbow items, 147 (26.2%) shoulder items, and 130 (23.2%) head, neck and spine items was compiled by 5 of the participants. Each item was graded for importance with a Likert scale from 1 (not important) to 5 (very important). Thus, scores could range from 10 (1X10) to 50 (5X10). An item score ≥40 was considered most relevant to competent practice as a rheumatologist.

Results. Mean item Likert scores ranged from 2.2±0.5 to 4.6±0.7. A total of 115 (20.5%) of the 560 initial items reached relevance. Broken down by categories this final relevant item list was composed by 7 (6.1%) general concepts items, 32 (27.8%) hand items, 20 (17.4%) forearm and elbow items, 33 (28.7%) shoulder items, and 23 (17. 6%) head, neck and spine items.

Conclusions. As a result of this Delphi exercise, a group of practicing academic rheumatologists with an interest in clinical anatomy compiled a list of anatomical items that were deemed important to the practice of rheumatology. We suggest these items be considered curricular priorities when training rheumatology fellows' in clinical anatomy skills as well as in programs of continuing rheumatology education.

Key words: clinical anatomy, regional pain syndromes, physical examination, rheumatology education

Introduction

It is generally believed that a skilled musculoskeletal examination is desirable in performing a complete and competent evaluation of patients in the rheumatology setting and is a basic requirement for the proper diagnosis of regional pain syndromes. In turn, the basic science of the musculoskeletal examination is clinical anatomy (1). Unfortunately, previous data from our group and others revealed a suboptimal knowledge of musculoskeletal clinical anatomy among rheumatologists and rheumatology fellows (2-4). Musculoskeletal clinical anatomy comprises a staggering number of items. From this universe, it would be desirable to identify those items that are most applicable to the practice of musculoskeletal medicine (5). Because musculoskeletal medicine encompasses office orthopedics, physical medicine and rehabilitation, rheumatology, and primary care medicine, a further step should be taken to adjust the larger field of musculoskeletal clinical anatomy to the basic needs of each of these specialties. Along this line, current efforts to improve the teaching of rheumatology at the pre-graduate level highlight the importance of clinical anatomy as the basis of physical diagnosis (6). The current study is an attempt to prioritize the structures of musculoskeletal clinical anatomy that are potentially most relevant to the learning, practice and assessment of rheumatologists' clinical skills. This report is limited to structures of the upper extremity and spine.

Methods

Each of the members of the Mexican Clinical Anatomy Task Force (GMAC is an acronym of its Spanish name) was asked to list the anatomical items of the upper extremity and spine felt to be relevant to the practice of rheumatology. These items were combined in a master list that may be obtained from the authors upon request. A total of 560 items were included, of which 45 were general items (8.0%), 138 (24.8%) were hand items, 100 (17.8%) forearm and elbow items, 147 (26.2%) shoulder items, and 130 (23.2%) spine items. The list was sent electronically via a one round, web-supported survey (SurveyMonkey) to all GMAC members plus five international experts from Boston (RAK) and New Orleans (JB), USA); La Coruña, Spain (FJTS); Leeds, UK (DMcG); and Toronto, Canada (SC). The latter, plus one GMAC member (JJC), were considered senior experts, while the remaining GMAC members were considered junior experts, based on their academic experience. Participants were asked to rank for clinical relevance each anatomical item according to a Likert scale as follows: 1, not important; 2, of dubious importance; 3, somewhat important; 4, important; and 5, very important. Thus, if the ten experts considered an item not important (score 1), the score for that item would be 10 (1x10); and if all considered an item very important (score 5), the score would be 50 (5x10). Therefore, the importance of each item, all participants´ scores added, could range from 10 to 50. For the final analysis, items that achieved an added score ≥40 were considered relevant for the practice of rheumatology with this score indicating that the item attained a mean ranking of at least “important.”.

Statistical analysis. In addition to descriptive statistics, one-way ANOVA and unpaired t-test (according to the number within each group) were used to compare individual and grouped experts' scores. A p-value <0.05 was considered significant. SPSS for Windows (20.0 version, IBM USA) software was used for statistical analysis.

Results

The entire range of scores was from 20 in for item #355 ("indicate origin of the subclavius muscle") to 48 for item #64 ("to know that palmaris longus tendon is a useful landmark for carpal tunnel injections"). The entire range of scores was from 20 in item #355 ("indicate origin of the subclavius muscle") to 48 in item #64. Three experts scored significantly different from the remaining seven, one higher and two lower. There was a large variation of Likert scores among the experts. The highest mean Likert score for an item was 4.6±0.7, the lowest was 2.2±0.5. The overall added scores per item were: score ≥40, 115; between 30 and 39, 367; and, between 20 and 29, 78. Tables 1 to 5 show, arranged by regions, the final list of 115 anatomical items that scored ≥40 (20.5% of the total). Broken down by categories, 7 of the basic items (6.1%), 32 (27.8%) of the hand items, 20 (17.4%) of the forearm and elbow items, 33 (28.7%) of the shoulder items and 23 (20.0%) of the head, neck, and spine items reached the relevance score.

When junior experts (PV-O, JEN-Z), MAS, CH-D) were compared with senior experts (JJC, JB, RAK, FJTS, DMcG, SC), the only discrepancy for list inclusion was encountered for item #384 ("to identify supraspinatus m. by inspection and palpation"). The senior experts rated this item significantly higher.

Discussion

In this survey, 115 of the 560 initial items list (20.5%) were considered potentially important for rheumatologic practice. It was of interest that for each of the anatomical regions approximately 20% of the items reached consensus. This finding suggests that the initial listing was equally weighted, and representative of each region and that all regions were considered important. In retrospect, this uniformity may also reflect the workshop-derived knowledge gained by the instructors in their interaction with fellows and practicing rheumatologists. Indeed, the clinical relevancy of the initial 560 item list may reflect the many “Meet the Professor” sessions and workshops given by some of the senior experts at the ACR meetings and elsewhere for over 30 years. Because of the interactive nature of these sessions, which were attended by fellows and rheumatologists from the US and abroad, the knowledge of the teachers was probably enriched by the participants´ questions, criticisms, and feedback therefore adding a potential bias

To the best of our knowledge, our survey is the first to list and prioritize the anatomical structures of the upper extremity, head, neck and spine that may be relevant to the practice of rheumatology. A similar study on the pelvis and lower extremity is underway.

These findings may be useful for curricular development in rheumatology training, as well as to design postgraduate education programs aimed at upgrading the clinical skills of participants. Establishing a repository of anatomic items that have been vetted as most central to the competent practice of rheumatology has direct relevance to mandates of the Accreditation Council for

Graduate Medical Education's (ACGME) Next Accreditation System (NAS) of milestone reporting for rheumatology trainees. Similarly our work dovetails well with the rheumatology Entrustable Professional Activities (EPA) established by a workgroup convened under the auspices of the American College of Rheumatology that include reference to skills in physical examination and performance of procedures, both of which depend significantly on an adequate knowledge of clinical anatomy (7).

In our view, mastering clinical anatomy may improve diagnosis in the regional pain syndromes and upgrade the assessment of the musculoskeletal system in patients with systemic rheumatic disease. Furthermore, joint and soft tissue injection skills may be increased by a more accurate knowledge of the involved structures. Also, as perceived by the GMAC members (CH-D and PV-O) who pursued full training in musculoskeletal ultrasonography (MSU), clinical anatomy and MSU nurture each other: the former gives the larger picture, and the latter, the details. We further believe that an improved anatomical understanding of musculoskeletal disorders may result, where they are unavailable, in a lesser utilization of expensive imaging procedures.

There are several strengths to our study. First, the initial items list was prepared independently by members of a group devoted to the teaching of rheumatologic musculoskeletal clinical anatomy. A second strength is that the item list was circulated for scoring to internationally recognized experts in academic clinical rheumatology who are not members of our core GMAC group. A third strength is the high concordance between the ratings of senior and junior experts indicating consistency and validity in the ranking of anatomic importance

independent of seniority. A fourth, albeit indirect strength is that a rather similar percentage of relevance was found in each of the surveyed anatomical regions. This similarity suggests that the list of candidate items was correctly weighted.

There are also several limitations to our study. One is that only one round of answers took place. However, additional rounds would have had the undesirable consequence of decreasing the number of items, which as it is, appears small enough from a practical viewpoint. Another limitation of our design is that the survey is only applicable to rheumatology, but misses other specialties that overlap in the care of patients with musculoskeletal conditions, such as Orthopedics, Physical and Rehabilitation Medicine, Neurology and Primary Care Medicine. However, in a recent study in which we compared the practical knowledge of clinical anatomy of orthopedic and rheumatology fellows, the pre-workshop knowledge was similar in the two groups (4). This finding suggests the applicability of the surveyed items to the orthopedic group as well. Furthermore, many attendees of our clinical anatomy workshops in Latin America have been Physical and Rehabilitation Medicine fellows and specialists, and the feedback we have received has been consistently favorable. Formal studies including Physical and Rehabilitation Medicine fellows and General and Family Medicine fellows would be of great interest. A final limitation is that many potentially important items in a clinical setting did not reach consensus. This is an inherent limitation of Delphi studies, and those items may be subsequently added if there is group agreement.

We believe our study contributes to a virtuous paradigm, the promotion of rheumatologic clinical anatomy to a higher level often reserved in rheumatology training programs for training fellows in immunology or advanced therapeutics.

A deeper knowledge of clinical anatomy can only help in the care of the 7 to 30% of patients with regional pain syndromes seen in outpatient rheumatology practices (8-12). Furthermore, and probably just as important, is our belief that a deeper knowledge of the involved structures may improve the clinical evaluation of patients with systemic rheumatic diseases in whom bone landmarks, joints, tendons, entheses, bursae, vessels, and nerves are often involved (13). Thus, many benefits may be derived from an enhanced knowledge of clinical anatomy among rheumatologists. It is our hope that this Delphi exercise, in which a range of international experts participated, will contribute to highlight the clinical anatomy that underlies rheumatology training and practice.

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