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Rheumatologic skills development: What are the needs of Internal Medicine Residents?

Susan F. Kroop, MD¹, Cecilia P. Chung, MD, MPH¹, Mario A. Davidson, PhD², Leora Horn, MD, MSc¹, Julie B. Damp, MD¹, and Charlene Dewey, MD, Med¹

¹Department of Medicine, Vanderbilt University School of Medicine, Nashville, TN, USA

²Department of Biostatistics, Vanderbilt University School of Medicine, Nashville, TN, USA

Abstract

Given the burden of rheumatic disease in our society and the anticipated future shortage of rheumatologists, all internal medicine (IM) residencies need to train internists who are capable of caring for patients with rheumatic diseases. The objective of this study was to perform a targeted needs assessment of the self-confidence of IM residents in the evaluation and care of patients with rheumatologic diseases.

A 16-item, web-based self-assessed confidence survey tool was administered to participating post graduate year (PGY) 1 (N=83) and PGY3 (N=37) residents. The categories of questions included self-confidence in performing a rheumatologic history and exam, performing common rheumatologic procedures, ordering and interpreting rheumatologic laboratory tests, and caring for patients with common rheumatologic diseases. Resident demographics, prior rheumatology exposure, and career plans were also queried.

PGY3 residents had higher self-assessed confidence than PGY1 residents in all categories. Self-assessed confidence in joint procedures was consistently low in both groups and when compared to other categories. Prior exposure to a rheumatology course or elective was not consistently associated with higher self-assessed confidence ratings across all categories. PGY3 residents showed less interest in rheumatology as a career than PGY1 residents, although the interest in the topic of rheumatology was not statistically different.

Our needs assessment shows a low level of self-assessed confidence in rheumatology knowledge and skills among IM residents. Despite improvement with PGY year of training, self-assessed

Corresponding Author: Susan F. Kroop, MD, Vanderbilt University Medical Center, 1161 21st Avenue South, T-3113 MCN, Nashville, TN 37232, susan.kroop@vanderbilt.edu, Phone: 615-322-4746, Fax: 615-322-6248.
Susan F. Kroop, MD, Department of Medicine, Vanderbilt University School of Medicine, 1161 21st Avenue So., T3113 MCN, Nashville, TN 37232
Cecilia P. Chung, MD, MPH, Department of Medicine, Vanderbilt University School of Medicine, 1161 21st Avenue So, T-3113 MCN, Nashville, TN 37232
Mario A. Davidson, PhD, Department of Biostatistics, Vanderbilt University School of Medicine, 2525 West End Ave, Suite 1100, Room 11122, Nashville, TN, 37203
Leora Horn, M.D., M.Sc., Department of Medicine, Vanderbilt University School of Medicine, 1301 Medical Center Drive, Suite 1710, Nashville, TN 37232
Julie B. Damp, MD, Department of Medicine, Vanderbilt University School of Medicine, 1215 21st Ave South, MCE 5th Floor South Tower, Nashville, TN 37233
Charlene M. Dewey, M.D., M.Ed., FACP, Department of Medicine, Vanderbilt University School of Medicine, 1107 Oxford House Nashville, TN 37232-4300

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confidence remains low. To improve resident's skills and self-confidence in rheumatology, more curricular innovations are needed. Such innovations should be assessed for overall effectiveness.

Keywords

Internal Medicine; Medical Education; Rheumatology; Musculoskeletal Medicine

Introduction

Arthritis affects at least 50 million Americans [1] and musculoskeletal (MSK) complaints are one of the most common patient complaints addressed in doctors' offices [2]. The burden of rheumatic disorders coupled with an anticipated shortage of rheumatologists [3], emphasizes the importance of educating internists to handle such rheumatologic complaints. Training internal medicine (IM) residents to become competent in recognizing and initiating treatment of common rheumatic diseases as well as in MSK procedures is one potential solution.

Despite this need, less than 3% of time in medical school curriculum is devoted to MSK diseases [4]. Moreover in post graduate training, IM residents spend the majority of their time training on the in-patient service, where exposure to patients with MSK diseases may be limited [5]. The current ACGME guidelines in IM residency training now mandate one-third of training time occurs in the ambulatory setting. Increasing resident ambulatory medicine training time offers additional opportunities for exposure to patients with MSK complaints and disease [6]. Ambulatory curriculums have included clinic time, didactics, computer based cases, OSCE's and multiple choice study questions [7]. The role of subspecialty clinics in ambulatory IM education is evolving as is the knowledge of how best to design the optimal educational experience in this setting under the current constraints of space and time[8].

As a first step to address this problem, we performed a targeted needs assessment on faculty and IM trainees to better understand the needs for advanced competency-based training in rheumatology at a single academic medical center in the United States (US). We sought the opinions of teaching faculty who encounter rheumatologic problems in the ambulatory setting. We evaluated IM resident self-assessed confidence in MSK diagnostic and procedural skills as well as in the care of patients with common rheumatologic diseases. Additionally, we sought to identify factors that may affect their self-confidence in these skills. This paper describes the findings of our needs assessment and outlines the steps planned to address the training issue.

Materials and Methods

Setting and participants

Our needs assessment was conducted within a large U.S. IM residency training program at Vanderbilt University Medical Center. Participants included clinical teaching faculty in IM and rheumatology. Post graduate year (PGY) 1 (N=83) and PGY3 (N=37) IM residents participated in this assessment.

Assessment

We queried six IM and eight Rheumatology faculty preceptors on the question: “What should a good internist know about MSK diseases?” Based on these answers, we constructed a 16-item, web-based, self-assessment survey that was administered to participating residents. Using a visual analog scale (VAS) (0=not confident, 100=extremely confident), the survey tool consisted of four main categories: self-assessed confidence in 1. performing a rheumatologic history and exam, 2. performing common rheumatologic procedures (knee injection and aspiration and shoulder and trochanteric bursa injection), 3. ordering and interpreting rheumatologic tests including Erythrocyte Sedimentation Rate (ESR), C Reactive Protein (CRP), Rheumatoid Factor (RF), Anti-Cyclic Citrullinated Peptide Antibody (anti-CCP), Antinuclear Antibody (ANA), and 4. caring for patients with osteoarthritis (OA), rheumatoid arthritis (RA), systemic lupus erythematosus (SLE), gout and fibromyalgia (FM). Additional questions addressed residents’ gender, interest in rheumatology as a topic and career, prior exposure to rheumatology and career plans. Surveys were developed, administered, and maintained through Research Electronic Data Capture (REDCap™) Version 6.4.4 - © 2015 Vanderbilt University. The web-based survey was sent via email to all categorical and preliminary PGY1 IM residents (N=83) just prior to the onset of their one week mandatory rheumatology block rotation from February 2013 through June 2014. All PGY3 IM residents (N=37) were invited via email to complete the survey between February and June 2013. Residents gave consent by completing the anonymous survey. This study was approved by the institutional review board at Vanderbilt University (IRB121497).

Analysis

Baseline characteristics are reported as median and interquartile range (IQR) for continuous variables and frequency (percentage) for categorical variables. The analyses were done in two steps. First, statistical differences between PGY1 and PGY3 survey results were tested. Second, within each PGY year group, scores for self-assessed confidence from trainees with prior rheumatology exposure were compared to those without prior rheumatology exposure. In addition, the PGY1 and PGY3 survey results were compared to each other. The results were statistically analyzed via two-sample Wilcoxon rank-sum (Mann-Whitney) tests using STATA 13.0 (Stata Corp. College Station, TX, USA).

Results

A total of 71/83 (86%) PGY1 and 31/37 (84%) PGY3 IM residents responded to the survey. The characteristics of the responding residents are described in Table 1. Twenty eight (39%) PGY1 IM residents identified prior exposure to rheumatology as follows: 20/28 (71%) had a medical school course, 14/28 (50%) had rheumatology attending contact, 12/28 (43%) had cared for a rheumatology patient, and 5/28 (18%) identified exposure due to a personal or family medical issue. Of the PGY3 IM residents, 22 (71%) planned careers in subspecialty medicine, whereas only 9 (29%) planned careers in General IM. Fifteen of the 31 (48%) stated that they had done a rheumatology elective. There was no difference in the interest in rheumatology as a topic between the PGY1 (median 62, IQR51-73) and PGY3 groups (62,

32–79), but there was a decrease in the interest in rheumatology as a career in the PGY3 group (18, 1–53) when compared to the PGY1 group vs (49, 24–48), $p < 0.01$).

When PGY3 IM resident survey results were compared to PGY1 IM resident results, the PGY3 IM residents self-assessed confidence results were statistically higher than PGY1 self-assessed results in all categories. Self-assessed confidence in joint procedures was consistently lower in both groups compared to history, physical exam, lab interpretation and patient care.

Figure 1 illustrates the comparison of results of PGY1 IM resident surveys between those who reported prior rheumatology exposure compared to those without prior exposure. Self-assessed confidence in rheumatology history taking, performing a rheumatologic exam, injecting trochanteric bursa, ordering and interpreting ANA and RF, and caring for patients with OA, RA, and SLE were statistically higher in those PGY1 residents with prior exposure to rheumatology. However, there was no difference in survey results between the two groups in performing procedures such as knee injection or aspiration and shoulder injections, ordering and interpreting ESR, CRP and anti-CCP lab tests, and caring for patients with gout or FM.

When comparing PGY 3 IM residents who did or did not take a rheumatology elective, the self-assessed confidence was higher for rheumatology exam skills, shoulder injection, ordering and interpreting ESR, CRP, and anti-CCP in those residents who took a rheumatology elective. Previous rheumatology elective experience did not result in a higher self-assessment in rheumatology history taking, knee injection or aspiration, trochanteric bursa injection, ordering and interpretation of ANA and RF, and in the care for patients with OA, RA, Gout, SLE or FM (Figure 2).

Discussion

This study shows that IM residents are not confident in the diagnostic and therapeutic skills required to recognize and care for patients with rheumatologic diseases in the IM setting. In both PGY1 and PGY3 IM residents, the self-assessed confidence in performing rheumatologic procedures was lower than other aspects of the diagnosis and care of the patient with rheumatologic disease. The PGY3 IM residents' self-assessed confidence in rheumatology history, exam, procedures, lab interpretation and patient care was higher in all categories than PGY 1 IM residents. Prior exposure to a rheumatology course or elective did not consistently improve PGY1 or PGY3 IM residents' self-assessed confidence in all aspects of diagnosing and treating patients with rheumatologic disease. In addition, although PGY1 and PGY3 residents show equivalent interest in the topic of rheumatology there was a decrease in interest in rheumatology as a career in the PGY3 IM residents compared to the PGY1 IM residents.

The low self-confidence of IM residents in rheumatology knowledge and skills we report agrees with the results reported by others. Prior studies of other IM programs from different countries showed that resident self-confidence was lower in rheumatology than that of other subspecialties [9, 10]. In contrast to the results of Katz and Oswald [9] who found that

increasing year of training was not associated with higher self-confidence in rheumatology, in our residents, there was a significant difference between the PGY3 self-assessed confidence and the PGY1 self-assessed confidence. This may be due to the fact that all our residents are required to do a mandatory one week ambulatory rotation, not considered an elective, in rheumatology whereas all of the Canadian residency programs do not require this. This rotation, regardless of how limited, may increase their learning about MSK and rheumatologic diseases.

In our study, prior exposure to rheumatology at the PGY 1 level was associated with increase in self-assessed confidence at performing rheumatology history and examinations but at the PGY3 level was associated with increase in self-confidence of rheumatologic examinations but not history taking skills. This may be due to the focus of the instruction at the Undergraduate Medical Education level for PGY1 on history and exam, and possible washout effect involving rheumatology histories at the PGY 3 level. If the PGY3 do not consistently use their rheumatologic knowledge and skills, then any benefit of prior instruction/exposure may be lost.

Prior exposure to a rheumatology course or elective was not consistently associated with improved confidence in all aspects of rheumatologic procedures, ordering and interpreting lab results, and care for patients with common rheumatologic diseases. This differs from the results of Katz and Oswald [9] whose results revealed that completion of a rheumatology rotation, as well as performance of a yearly MSK OSCE and more frequent rheumatology teaching was associated with higher self-confidence. Rheumatology curricula including formal didactics, case-based learning and an information package have been shown to increase resident satisfaction and self-confidence [10]. However, additional studies show that a rheumatology specific curriculum may not result in an improved performance in OSCE or on board scores [11, 12]. Specific rheumatology skill workshops have been shown to improve mean comfort level with knee and shoulder arthrocentesis [12, 13]. Differences in curriculum content, instructional methods and timing may be a factor in these mixed results. To address this issue, we plan a curricula change to combine these educational modalities during a single block rotation and study the impact of this change including objective measures of performance including OSCE's, board scores and chart audits.

The difference in interest in rheumatology as a subject and as a career between the PGY1 and PGY3 IM residents is intriguing. Over 50% of rheumatology fellows reported their first exposure to rheumatology in medical school[14], however the overall medical student exposure to rheumatology is limited[15]. The opportunity for a rheumatology rotation in the first year of IM residency has been associated with the likelihood that the trainee may choose rheumatology as a career [9, 16]. Further work needs to be done to identify and address any other factors that are involved in residents' subspecialty decisions once they commence their post graduate training. Further elucidation of these factors might enable a curriculum adjustment during early training that increases career interest in rheumatology.

This study has some limitations. First, it is from a single academic institution. Second, the small number of residents surveyed may not be a representative sample from other institutions and thus our results may not be generalizable to all institutions. Third, the survey

measures self-assessed confidence, which may not accurately reflect trainees' competence. In a literature review of continuing medical education, Davis et al found 7 out of 20 studies showed a positive association between self-assessment and observed competence [17]. In studies involving MSK education, results from both Smith et al [10] and Leopold et al [18] show similar improvements in self-confidence and objective assessments measures. Thus, further evaluation of competency measures should be included in the evaluation of future curriculum changes. Additional objective outcome measures in the care of patients with rheumatologic diseases by IM residents are needed including chart audits and will be analyzed in future studies.

To address the need to support and encourage resident training in rheumatology and assist IM and rheumatology program leaders in competency based medical education, we plan a rheumatologic ambulatory curriculum revision at our institution. Changes will include increased subspecialty ambulatory clinic time, online rheumatologic cases and subject-based information content, as well as a rheumatologic skills training session during the rheumatology subspecialty rotation. IM resident rheumatology subspecialty Entrustable Professional Activities are currently under development nationally with input by rheumatologists and will guide future curricular content. These may include the evaluation and early management of new inflammatory arthritis, appropriate utilization of rheumatologic laboratory tests, and co-management with subspecialists in the care of complex patients. Measuring outcomes of additional curricular changes will be important in improving the abilities of IM residents to care for patients with rheumatologic diseases. This may lead to more routine patients being managed by internists leading to a more complex referral case mix for rheumatologists. Secondary effects are to potentially increase recruitment of IM residents to pursue rheumatology subspecialty training. In conclusion, our needs assessment shows a low level of self-assessed confidence in rheumatology knowledge and skills among IM residents at our institution. Despite improvements with PGY year of training, self-assessed confidence remains low for a variety of rheumatologic skills. Further intervention for curricula changes in IM residency programs paying particular attention to proven educational techniques, with input and feedback from the rheumatology community is necessary to address this issue.

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Panel 1: Self-rated confidence in rheumatologic basic skills

Panel 2: Self-rated confidence in ordering and interpreting laboratory tests

Panel 3: Self-rated confidence in patient care

Figure 1. Self-confidence survey results: PGY-1 Internal Medicine residents by prior exposure to rheumatology status

* $p < 0.05$, error bars represent 95% confidence intervals (C.I.), PGY-1 with no exposure (n=43), PGY-1 with exposure (n=28)

Panel 1: Self-rated confidence in rheumatologic basic skills

Panel 2: Self-rated confidence in ordering and interpreting laboratory tests

Panel 3: Self-rated confidence in patient care

Figure 2. Self-confidence survey results: PGY-3 Internal Medicine residents by prior exposure to rheumatology elective

* $p < 0.05$, error bars represent 95% confidence intervals (C.I.), PGY-3 with no prior elective (n=16), PGY-3 with prior elective (n=15)

Table 1

Resident Demographics

	PGY 1 (n=71)	PGY3 (n=31)
Gender (Female)	34 (48%)	18 (58 %)
Preliminary Internal Medicine	10	Not applicable
Categorical Internal Medicine	53	27
Combined IM/Pediatrics	8	4
Career plans:		
General IM	12	9
Subspecialty IM	49	22
Undecided	10	Not applicable