

Correlation Study of Training, Assessed and Community Prevalent Rheumatologic Diagnosis in a single Rheumatology Training Center

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Abstract. The objective of this study is to assess the concordance between the rheumatic diagnoses seen by training-fellow and to correlate with the assessed diagnosis by the Mexican Accreditation Council for Rheumatology (MACR) and the prevalent diagnosis. An observational study in a single rheumatology-training center was made. The training rheumatologic diagnosis (TRD) was defined by the number of consultations of each diagnosis by clinical records. The assessed diagnoses (ARD) were defined by the number of questions evaluated in the board examination, and the community prevalent (CPRD) ones were defined by the frequency of the diagnosis by Community Oriented Program for Control of Rheumatic Diseases (COPCORD) evaluation. 6279 medical records were reviewed. 854 (13.6%) were first-time evaluations, while 5,400 (86.4%) were women with a mean age of 47.9 (SD 15.45) years. The Spearman correlation coefficients of the 32 different diagnoses were: TRD vs. ARD, 0.492 ($p = 0.004$), TRD vs. CPRD 0.597 ($p = 0.01$) and ARD vs. CPRD 0.624 ($p = 0.01$). Although, the most common musculoskeletal disease in our community did not obtain the frequency observed by students or evaluated in the written exam, but a moderate correlation was observed in this study.

Keywords: Medical education, rheumatology training programme, objective structured clinical exams, OSCE.

INTRODUCTION

The importance to improve the curricula for rheumatology fellow-residents in order to achieve a mastery of the knowledge, skills, and attitudes necessary to practice rheumatology competently has been reported (Criscione-Schreiber *et al.*, 2017). This knowledge is evaluated by their performance on certifying examinations.

In Mexico, the postgraduate program in rheumatology aims learning of musculoskeletal and autoimmune disorders, and every specialist in rheumatology require from 4 to 6 years of training, 2 years of rheumatology and 2 to 4 years of Internal Medicine in order to be graduated by the university. This is the case of the Universidad Autónoma de Nuevo Leon, where this study was carried out, as its Faculty of Medicine's postgraduate program requires to have completed the training in the Specialty of

Internal Medicine (4 years) and then carry another two years of training in the Sub-specialty of Rheumatology.

In Mexico, in order to be certified by the Mexican Accreditation Council for Rheumatology (MACR), the graduates require passing an examination where their skills on rheumatology will be evaluated. Also, in order to be a candidate to be examined by certification examination, a physician must complete the requisite predoctoral and medical education, meeting the training requirements, the licensure requirements and the procedural requirements of the MACR.

This evaluation consists of both, a multiple-choice question (MCQ) test and an objective structured clinical examination (OSCE) (Pascual *et al.*, 2015; Tervo *et al.*, 1997).

In this examination, the Mexican Rheumatology Board (MBR) intent is to evaluate the 6 core competency areas; patient care, medical knowledge, systems-based practice, practice-based learning and improvement, professionalism, and interpersonal and communication skills as described by Criscione-Schreiber *et al.* (2017). Although, due to the time this board examination takes to carry out, not all the item could be evaluated as a whole.

In 2015 and 2016, Forty-three and thirty-seven candidates respectively, underwent both tests and 5 candidates received a failing score each year in the examination of the MACR (Pascual-Ramos *et al.*, 2017).

The programs in each training centers depend on each University criteria, and the MACR works to homologate the training and skill-achievement process with the same evaluation process.

We could infer that there is some discordance between each training program and the evaluation processes. This could be explained by heterogeneity in the prevalence of rheumatic diseases for every population. Peláez-Ballestas *et al.* (2011) described an epidemiological study by Community Oriented Program for Control of Rheumatic Diseases (COPCORD) methodology of 19,213 individuals in 5 regions in our country where they found a prevalence of musculoskeletal pain in 25.5%, osteoarthritis in 10.5%, back pain in 5.8%, rheumatic regional pain syndromes in 3.8%, rheumatoid arthritis (RA) in 1.6%, and fibromyalgia in 0.7% (Peláez-Ballestas *et al.* (2011). They found different prevalence by region of the same pathologies, and also, the nature of the main training center (second or tertiary care health centers) and the patient referral pipeline.

To assess this possible discordancy, the aim of this study is to describe the rheumatic diagnoses seen on daily basis by training-fellow, and correlate with assessed diagnosis by MACR and the diagnosis prevalent in our community.

METHODS

An observational study was conducted from March 2014 to March 2015 in a single rheumatology-training center at Northern Mexico University Hospital (Universidad Autónoma de Nuevo León). The training rheumatologic diagnosis (TRD) was defined by the number of consultations of each diagnosis made by clinical records. If one patient with rheumatoid arthritis was seen 3 times in the study period, it counted as 3 times. The assessed rheumatologic diagnoses (ARD) were defined by the number of questions evaluated in the written part of the board examination, and if there were 5 questions regarding rheumatoid arthritis, it counted as 5 times. Finally, the community prevalent rheumatologic diagnosis (CPRD) were defined by the frequency of the diagnosis by COPCORD with a pain score (Rodríguez-Amado *et al.*, 2011).

We made descriptive statistics and used the Spearman's Rho to evaluate the correlations of the diagnosis frequencies by each category.

RESULTS

6279 medical records were reviewed, and 854 (13.6%) were of first-time evaluation. 5,400 (86.4%) were women, with a mean age of 47.9 (SD 15.45) years. There were 32 different diagnoses seen on training consult, asked in the exam or prevalent in the community. The most prevalent TRD was rheumatoid arthritis (RA) with 1776 consultations (28.28%), the most prevalent ARD was RA with 35 questions (15.28%), and the most prevalent CPRD was soft tissue pathologies with 2230 participants (43.1%). There were twelve ARD not seen on residence training consultation nor prevalent in the community including polymyalgia rheumatica, reactive arthritis, Takayasu's arteritis, giant cell arteritis, Paget's disease, Marfan's disease, polyarthritis nodosa, rheumatic fever, amyloidosis, among others.

The most discordant and prevalent diagnosis were soft tissue rheumatic pathologies, most seen in the community but just present in the ARD in 4.37%, and TRD in 8.82%.

Descriptive statistics are shown in Table 1.

The Spearman correlation coefficients of the 32 different diagnoses were: TRD vs. ARD, 0.492 ($p = 0.004$), TRD vs. CPRD 0.597 ($p = 0.01$) and ARD vs. CPRD 0.624 ($p = 0.01$). Table 2.

DISCUSSION

To the best of our knowledge, this is the first study to evaluate this comparison. The results show that the correlation coefficients are acceptable. There are diagnoses evaluated that were not prevalent, nor seen in the residence. See Table 1.

The specialty of rheumatology is characterized by being a specialty that is required to evaluate some rare diseases that are not usually seen during rheumatology training, but in the certification exam they form an important part of the examination

The OSCEs have been used to compare the effect of tutor skills on the delivery and acquisition of musculoskeletal physical examination skills by medical students (Pascual-Ramos *et al.*, 2017; Melo *et al.*, 2017). Both OSCEs and traditional assessment tests build on academic theory and in some cases we pretend to evaluate skills about diseases seen by the fellow-residents in their training.

There is a discordant evaluation in the number of questions about soft tissue diseases, which are very prevalent and are part of the differential diagnosis of rheumatologic pathologies, but these pathologies are not seen to be very frequently in the third level hospitals.

Table 1. Training, assessed and prevalent rheumatologic diagnoses.

	Resident		MRC		COPCORD	
	n	%	n	%	n	%
RA	1776	28.28	35	15.28	307	5.93
OA	1061	16.90	9	3.93	2017	38.98
SLE	800	12.74	27	11.79	13	0.25
Soft tissue	554	8.82	10	4.37	2230	43.10
FM	476	7.58	5	2.18	0	0.00
Sjögren S	357	5.69	7	3.06	0	0.00
Osteoporosis	307	4.89	5	2.18	0	0.00
SSc	170	2.71	11	4.80	4	0.08
APS	111	1.77	10	4.37	0	0.00
Spondyloarthritis	111	1.77	5	2.18	27	0.52
Myositis	99	1.58	10	4.37	0	0.00
Juvenil Arthritis	87	1.39	3	1.31	0	0.00
PsA	86	1.37	5	2.18	0	0.00
Vasculitis ANCA	79	1.26	5	2.18	0	0.00
Raynaud	61	0.97	5	2.18	0	0.00
Crystal arthropathies	58	0.92	15	6.55	576	11.13
Connective tissue	45	0.72	0	0.00	0	0.00
AOSD	13	0.21	0	0.00	0	0.00
PMR	7	0.11	5	2.18	0	0.00
ReA	7	0.11	5	2.18	0	0.00
Behcet	6	0.10	0	0.00	0	0.00
Takayasu	5	0.08	5	2.18	0	0.00
Henoch	3	0.05	0	0.00	0	0.00
Giant cell	0	0.00	6	2.62	0	0.00
Paget	0	0.00	6	2.62	0	0.00
Marfan	0	0.00	5	2.18	0	0.00
Polyarteritis nodosa	0	0.00	5	2.18	0	0.00
Rheumatic fever	0	0.00	5	2.18	0	0.00
Amyloidosis	0	0.00	5	2.18	0	0.00
ASIA	0	0.00	5	2.18	0	0.00
Mixed cryoglobulinemia	0	0.00	5	2.18	0	0.00
Hemophilia	0	0.00	5	2.18	0	0.00

Rheumatoid Arthritis (RA), Osteoarthritis (OA), Systemic Lupus Erythematosus (SLE), Fibromyalgia (FM), Systemic Sclerosis (SSc), Antiphospholipid Syndrome (APS) Psoriatic Arthritis (PsA), Adult Onset Still's Disease (AOSD), Polymyalgia rheumatica (PMR), reactive arthritis (ReA), Autoimmune/Inflammatory Syndrome Induced by Adjuvants (ASIA), Mexican Rheumatology Council (MRC), Community Oriented Program for Control of Rheumatic Diseases (COPCORD)

An evaluation of the residency program would allow for the establishment of rotation plans for residents so that they would be exposed to the pathologies least seen in their training program.

The weaknesses of this study, we can mention the

following; no procedural capabilities were assessed. Efficiency in the examination was not evaluated. No hospitalized patients were evaluated. We did not evaluate the clinical cases that the resident evaluates daily.

Table 2. Statistical correlation between diagnoses.

		RESIDENT	MRC	COPCORD
RESIDENT	Correlation coefficient	1	.492**	.597**
	p value	.	0.004	0
MRC	Correlation coefficient	.492**	1	.624**
	p value	0.004	.	0
COPCORD	Correlation coefficient	.597**	.624**	1

Mexican Rheumatology Council (MRC), Community Oriented Program for Control of Rheumatic Diseases (COPCORD).

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CONCLUSION

Although, the most common musculoskeletal disease in our community did not obtain the frequency observed by students or evaluated in the written exam, we observed a moderate correlation. We considered it is important to enhance the knowledge and improve the examination according to the most prevalent diseases to prepare the future rheumatologists.

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