Progress of the Attractiveness of Rheumatology Among Medical Speciality Training Candidates (MIR) in Spain

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ABSTRACT

Objective: To describe the progress of the attractiveness of rheumatology at successive MIR calls, from 1983 to 2014.

Methods: Candidates in the Spanish training system for medical doctors choose their specialties sequentially, ordered by their ranking in the qualifying exam (MIR). The highest, median and lowest rank of candidates choosing rheumatology training positions in every MIR call from 1983 to 2014 was requested from the Department of Management of Specialized Medical Training (General Department of Professional Regulation; Spanish Ministry of Health). To compare, the same data was requested for other specialties. In order to define and analyze the attractiveness of each specialty we introduce an ‘index of attractiveness’, based on the normalized difference of the actual median rank reported for each year and the average median obtained in 1000 simulations in which candidates choose specialties at random.

Results: Regarding the median of the election of rheumatology, the range went from 244th in 1983 to 3394th in 2008, showing a progressive increase over the years in absolute figures. A mathematical simulation allowed quantifying the difference between the observed median and what would have happened if specialties had been chosen by pure chance. Results show a tendency to recover the attractiveness of rheumatology in recent years.

Conclusions: After a sharp decline in the attractiveness of rheumatology during the last years of the 20th century, there seems to be a recovery.

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Palabras clave: Reumatología, Especialización, Atractivo

RESUMEN

Objetivo: Describir la evolución del grado de atractivo de la Reumatología en las sucesivas convocatorias MIR de 1983 a 2014.

Métodos: Se solicitó al servicio de Gestión de Formación Sanitaria Especializada de la Subdirección General de Ordenación Profesional del Ministerio de Sanidad español datos de elección de Reumatología en las convocatorias MIR de 1983 a 2014: número de orden de elección de la primera y última plazas de Reumatología, así como la mediana. A efectos de comparación, se solicitó la mediana de elección de otras especialidades. Para definir el grado de atractivo de cada especialidad, se realizó un análisis matemático de 1.000 simulaciones sobre la mediana que habría obtenido cada especialidad si se hubieran elegido al azar y se calculó la desviación entre la mediana observada y la mediana por azar generada mediante las simulaciones.

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Introduction

Rheumatology is the specialty that concerns the study, prevention, diagnosis and treatment of medical diseases of the musculoskeletal system and systemic autoimmune diseases (SAD). The definition of the specialty is provided in the order from the Spanish ministry that regulates the training that residents should receive to be granted official accreditation as specialists in rheumatology recognized by the Spanish government.1

Rheumatology practice has undergone significant changes in recent years, including the introduction of biological therapies or the widespread implementation of musculoskeletal ultrasound in routine clinical practice. On the other hand, the presence of rheumatologists in the body of professors teaching undergraduate and graduate medical studies appears to have shown a substantial increase in the last few years. Thus, it is to be hoped that there will have been greater exposure to the specialty by the most recent classes of medical undergraduates and graduates.2

The choice of a position for specialization using the ranking in the qualifying examination for Spanish medical residents (MIR) represents a unique and accurate observatory of the preferences of Spanish physicians toward the different specialties—medical, surgical and procedural—offered annually in the successive MIR calls.

The objective of this report was to describe the changes in the attractiveness of the specialty of rheumatology in successive MIR calls from 1983 to 2014, and to compare them with those observed in other specialties.

Methods

Every year, the Spanish Ministry of Health announces a call for specialized medical training. Both the total number of positions offered and those available for each specialty change from one year to another. The choice of a position on the part of candidates is sequential, according to the ranking of each in the year that the call is posted. Thus, once all of the positions in a specialty have been chosen, this option is no longer available for candidates whose rank is higher.

The median rank of the candidates who choose a certain specialty in each call could be understood to be an indicator of the popularity of said specialty in that year. The median is the rank of the candidate who chose the position in rheumatology that occupied the mean position of those places offered for said specialty. For example, if there are 50 available positions for a specialty in a given year and the 50 best candidates in that call choose that specialty, the median rank for that year would be 25. In practice, the real median would typically be higher, as it is not very likely that all the best candidates would choose the same specialty. In general, it can be understood that the lower the median rank of a specialty indicates a greater attractiveness of that specialty in that given year.

It is necessary to be cautious in properly interpreting this estimator of attractiveness. For example, if, for a certain specialty, there are 100 positions one year and 50 the next, the median in the case that all the best candidates chose that specialty would be 50 and 25, respectively. This indicates that the median by itself is not a valid quantitative indicator of attractiveness for comparing the popularity of specialties over the years.

To rectify this situation, we created a normalized popularity index based on the difference between: (1) the mean median obtained by 1000 computer simulations in which the candidates chose the specialty at random and (2) the real median of each specialty for each year. This difference was appropriately normalized in relation to the total number of positions for each year.

To carry out this simulation, we asked the Department of Management of Specialized Medical Training of the General Department of Professional Regulation of the Spanish Ministry of Health, Social Services and Equality to provide data on the choice of the specialty of rheumatology in the MIR calls from 1983 to 2014. Specifically, we requested the number of positions of rheumatology offered each year and the highest and lowest ranks, as well as the median rank, of candidates choosing rheumatology in each MIR call. To enable comparisons with other specialties, we also asked for the number of positions offered and the median rank for cardiology, dermatology, endocrinology, internal medicine and allergology, as well as the total number of positions offered encompassing all of the specialties in each call (Ntot). The simulation shows the choice of the best Ntot of the MIR candidates for each year. In the simulation, the candidates choose a specialty of among the 6 named above on which they had data, and a seventh option referred to as “other”, which includes all the other specialties available for the MIR on which there was no data, and including those candidates who opted for not choosing a position in each call.

In the simulation, the candidates chose the specialty at random. The possibility of choosing a certain specialty, including “other”, concludes when all the available positions for that specialty have been chosen. From that point on, the random selection in the simulation is restricted to the other specialties. At the end of each simulation round, each candidate of the Ntot will have been assigned a specialty (including the possibility of “other”).

After each simulation, the median rank for each specialty was calculated. As the choice was random, this median varied from one simulation to another. Subsequently, we calculated the mean of the medians of 1000 independent randomly assigned simulations. This generated a mean median for each specialty for each year.

The popularity index was generated by comparing the median obtained at random with the real median for each specialty for each year. If the real median was lower than the randomly produced median, it could be considered that the specialty was popular; otherwise, if the real median was higher than the randomly generated median, it could be considered that the specialty was not popular.

To achieve a normalized quantitative measure that can be compared over a period of years, we utilized the following popularity index:

\[
I = \frac{\text{Mean median of the simulations} - \text{Real median}}{N_{\text{tot}}}
\]

It could be that the outcome numerical measure of the simulation would change if we utilized the data relative to all of the
specialties included in the “other” category. However, we would not expect changes in the shape of the curves. As a measure of verification, we calculated another simpler popularity estimator that consisted in dividing the negative median of each specialty by the number of total positions available each year. We observed that the qualitative behavior (curves) of this simpler index was similar to that obtained by simulation.

Results

Table 1 shows the number of the first position chosen, the median and the number of the last position chosen in the specialty of rheumatology in the calls from 1983 to 2014. The best rank in the order of choice of the first position in rheumatology was in the 1984 call, in which number 2 of the MIR candidates chose that specialty, whereas the call in which the first position in rheumatology was highest was that of 1999, in which the first position chosen was number 995. With respect to the number with which the last position offered was chosen, it ranged between number 629 in the 1984 call and number 4913 in the calls of 2007 and 2012. Concerning the median, the range falls between number 244 in the 1983 call and 3394 in the call of 2008; it can be observed that, in absolute terms, there is a progressive increment over the years.

As the median is influenced not only by the attractiveness of the specialty among the MIR candidates, but by the total number of positions and the number of positions offered in each specialty, the mathematical simulation utilized enabled the quantification of the deviation between the median observed and the one that would have resulted if the specialties had been selected by pure chance.

Table 2 shows the total number of positions offered, the positions offered in each specialty and the medians according to choice in rheumatology, as well as dermatology and cardiology (currently considered to be highly attractive among MIR candidates), internal medicine (a specialty that was often chosen in the 1980s), endocrinology (a medical specialty that currently has a somewhat greater attractiveness than rheumatology, but less than dermatology and cardiology) and allergology (a specialty that has a moderate attractiveness at present). Fig. 1 shows the change in the differential of the median observed as opposed to that calculated with random selection in rheumatology versus the other specialties analyzed. There is a trend toward recovery of the attractiveness of rheumatology after a nadir seen at the end of the 1990s. From a graphic point of view, there are 2 upward slopes: one very steep starting around 2000 and the other, with a shorter duration, that started in 2008 and with an apparent plateau effect that commenced in 2010.

Discussion

The system for the choice of MIR positions is characterized as being centralized, is absolutely meritocratic and is extended throughout all of Spain. This selection system, governed by the order of preference of the candidates, represents an extraordinarily precise vantage point from which to view the attractiveness of the different specialties among physicians who graduated from Spanish medical schools, who represent the main body of candidates for MIR positions. Our study demonstrates a severe crisis in the attractiveness of rheumatology, which appears to be recovering in recent years.

It is difficult to define the causes responsible for the profound deterioration in the attractiveness of the specialty that commenced at the end of the 1980s. Rheumatology went from being an attractive specialty, that was chosen by MIR candidates who ranked among the very first, to be one of the least demanded specialties. This all occurred with no relevant change in the content of the specialty. The lack of interest in rheumatology that started to take shape at the end of the 1980s had a clear impact on the advice that recent medical graduates received from residents and young rheumatologists, immersed in an imminent future of unemployment and precarious contracts.³

The specialty of rheumatology is essentially clinical. There are no complex techniques, like digestive endoscopy or bronchoscopy. It is based on the specialization of the work, as in other medical specialties like dermatology, endocrinology, allergology, medical oncology and neurology. It has the added attractiveness that the field includes the management of SAD,¹ and is the medical specialty that specifically trains its residents in the management of the complex situations presented by patients diagnosed with those processes.

Over the last 20 years, there have been substantial changes that may be responsible for the apparent recovery of the attractiveness of rheumatology: the introduction of ultrasound in rheumatic diseases and of biological agents, as well as a greater presence of rheumatologists on medical faculties.

The extraordinary efforts of the school of ultrasound of the Spanish Society of Rheumatology (SER) have added a sixth sense to the examination of the musculoskeletal system performed by rheumatologists,⁴ with the use of ultrasound in rheumatic diseases and to be essential to our activity,³ although it is not recognized as such by the official training guidelines.¹

Another point of inflection is the introduction of biological therapy, which has revolutionized the management of diseases like rheumatoid arthritis, ankylosing spondylitis, nonradiographic axial
This takes us to the last factor of the equation: the perception that medical students and future MIR candidates become acquainted with the specialty of rheumatology throughout their training. In this respect, the presence of rheumatologists on the undergraduate teaching staff is fundamental. Their comportment with undergraduates and what they transmit to students results to a great deal in conveying the attractiveness of rheumatology among MIR candidates. If rheumatologists are capable of transmitting its added value, their enthusiasm and its health outcome, it is unquestionable that the attractiveness of the specialty will continue this upward trend, as recent data seem to indicate. For this purpose, programs like ReumaAcademia, endorsed by the SER, are of maximum strategic importance when it comes to promoting the presence of rheumatologists on the faculty of medical schools.

The reduced attractiveness of the specialty of rheumatology is not a question involving Spain alone, and has been the subject of reflection in Canada, the United States and the United Kingdom.7–10 Surveys in different countries have demonstrated that the opportunity of being able to complete a rotation in rheumatology during the period of core studies in residency or while in medical school increases the probability that residents or students ultimately choose rheumatology as their definitive specialty. In fact, it seems to be important that exposure to rheumatology occurs as soon as possible since interest in the specialty wanes the longer this contact takes to come about.10

We do not know the distribution by age and sex of the candidates, or where they are from. Their expectations in terms of professional and economic aspects and hopes of future contracts are also unknown, as is the need for certain requirements for access to specialized training. It is not possible to speculate on the
influence of other determining factors that might have modified
the attractiveness of rheumatology over the course of years.

In short, our study indicates that the attractiveness of rheu-
matology among MIR candidates is recovering, and that a realistic and
enthusiastic transmission to medical students and, in the future, to
residents during the period of medical core studies, showing what
the specialty signifies for patients, is probably the best recipe for
consolidating and enhancing this recuperation.

Ethical Disclosures

Protection of human and animal subjects. The authors declare
that no experiments were performed on humans or animals for
this study.

Confidentiality of data. The authors declare that no patient data
appear in this article.

Right to privacy and informed consent. The authors declare that
no patient data appear in this article.

Conflicts of Interest

The authors declare they have no conflicts of interest.

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