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Profile of the General Surgery resident: what are the changes in the 21st Century?

Perfil do residente de Cirurgia Geral: quais as mudanças no Século XXI?

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A B S T R A C T

Objective: *to verify the profile of the General Surgery residents of the Clinics Hospital (HC) of the Faculty of Medicine of the University of São Paulo (FMUSP).* **Methods**: *we evaluated the residents approved in the public contest for the Medical Residency Program in General Surgery of HC-FMUSP in the years 2014, 2015 and 2016. We carried out the study by applying a questionnaire and gathering information from the Medical Residency Commission of the Institution. We analyzed data on identification, origin of the candidate, undergraduate school, surgical teaching received, reason for choosing Surgery, residency expectations, choice of future specialty and pretensions as to the end of medical residency. We also analyzed the result of the examination of access to specialties.* **Results**: *the mean age was 25.8 years; 74.3% of residents were male. The majority (84.4%) had attended public medical schools, 68% of which were not in the Southeast region; 85,2% of the residents were approved in the first contest. The specialty choice was present for 75.9% of individuals at the beginning of the residency program, but 49.5% changed their minds during training. Plastic Surgery, Urology and Digestive System Surgery were chosen by 61.5%. Sixty hours per week work were considered adequate by 83.3%; 27.3% favored direct access to the specialty. At the end of the specialty, 53.3% intended to continue in São Paulo, and 26.2%, to return to their State of origin. A strict-sense post-graduate course was intended by 68.3%.* **Conclusion**: *the current profile of the resident reveals a reduction in the demand for General Surgery, an earlier definition of the specialty, options for increasingly specific areas and an activity that offers a better quality of life.*

Keywords: *Internship and Residency. Education, Medical. Specialties, Surgical. Career Choice.*

INTRODUCTION

Residency is a fundamental step in the training of the physician to the conditions of exercising the profession appropriately. It is a resource set up world-wide, and considered the more efficient way of deepening the knowledge in a field of medical science[1]. It was introduced at the end of the 19th Century by William Halsted, Professor of Surgery, and William Osler, Professor of Clinical Medicine, at the Johns Hopkins University Hospital in Baltimore, USA, with participation of other Professors of the Institution. In Brazil, it began in 1944, at the Hospital of the State Public Servant of Rio de Janeiro and at the Clinics Hospital (HC) of the Faculty of Medicine of the University of São Paulo (FMUSP)[1].

Residency, as a proposal since its inception, consists in training under permanent supervision, with teaching provided by the faculty, the resident having responsibility for the patient's care and participation in research, with a pyramidal progression system. The fundamental objective is to prepare the physician to act in clinical practice[2]. Among the four major areas of direct access general specialties, General Surgery is the second most popular choice, after Internal Medicine, and followed by Gynecology and Pediatrics. At HC-FMUSP, over the last years, the residency contest has displayed an average of ten to 12 candidates per position, for a two-year training course that constitutes a requirement for access to surgical specialties.

Some factors influence the choice of specialty, such as the style or quality of life, the prestige of the

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area and the economic factor. However, for most undergraduate medical students, prestige and salary are less important than a proper balance between work and a private life[3-7]. Dermatology, Otorhinolaryngology and Ophthalmology are the three most sought specialties among those with direct access, with an average of more than 15 candidates per position.

The demand for General Surgery has been declining in recent years, and this lack of interest has been attributed to the proliferation of surgical specialties, to overwork, to the greater number of female students in the medical undergraduate course, and mainly to the loss of role models to look up to, which has been referred to in numerous publications that discuss the subject[8,9]. Due to these aspects, the profile of the General Surgery resident has changed.

The objective of this study is to assess the profile of general surgery residents of the HC-FMUSP, analyzing particularities of the training in the medical undergraduate course, the choice of specialty after the initial two years and the pretensions as to the end of the training.

METHODS

We evaluated residents approved in the contest to fill the 48 vacancies/year of the Medical Residency Program in General Surgery of the HC-FMUSP, in the years of 2014, 2015 and 2016. The study was submitted to, and approved by, the Institution's Ethics Committee, under the number 679416.

We used data obtained from two sources: a questionnaire of optional filling applied in the first trimester of the program, and information from the Institution's Medical Residency Commission (COREME). We collected identification (sex, age, marital status), candidate's background, medical graduation school and number of contests participations until entering the residency.

The questionnaire also analyzed the influence to choose the residency in surgery, the expectations for the two years of training, the choice of the future specialty and aspects related to the pretensions after the end of the program.

RESULTS

We obtained responses from 85.4% of the residents and fully evaluated the data from COREME. The mean age was 25.8 years, with a predominance of males (74.3%), and 3% were married when they entered medical residency. For 85.2% of the residents, approval took place in the first contest for General Surgery, and 14.8% had already applied for the same specialty in previous years. In addition to the residency contest at the Clinics Hospital, 61.2% had applied for other services, with an approval rate of 97.2%.

Regarding the Medical Graduation Course, 84.4% were from Public Schools, and 68% completed training in the Southeast region. Of the 144 selected residents, 49 (34%) were students graduating from FMUSP, with 66% of the places occupied by students coming from different medical schools in the country (Table 1).

Table 1. *Profile of General Surgery Residents – FMUSP (2014-2016).*

Mean age	25.8 years
Male gender	74.3%
Married	3.3%
From the Southwest region	68%
Approved on the first exam	85.2%
From public schools	84.4%
From FMUSP	34%
Participated in surgical team during graduation	48%

The choice for a surgical specialty was influenced by internships in the medical undergraduate course to 71.5%, who had the opportunity to assist and perform procedures during the internship. During graduation course, 48% reported having participated in surgical teams. The HC option was because it was a reference center.

Regarding the specialty choice, 107 (75.8%) already had the career definition to follow at the beginning of the residency. In the evolution of the training, 53 (49.5%) changed the choice after going through all

the Disciplines included in the program (Table 2). Plastic Surgery and Urology were the most desired, being the main specialties chosen along with Digestive Surgery, by 61.5%.

Table 2. *Choice of Specialty - FMUSP (2014-2016).*

Specialty defined at the beginning of the residency program	75.80%
Changed option	49.5%

In the residents' opinion, 83.3% considered the 60 hours of training per week adequate, but 16.7% considered them insufficient. In addition, 27.3% favored direct access to the specialty. Regarding the meaning of the two-year training period, the questionnaire offered three choices, with the possibility of indicating more than one: confirmation of the specialty (52.8%), acquisition of basic technical requirements (78%) and General Surgery as a path to take towards the specialty (17.1%).

Of the 144 residents who started the program, three dropped out and seven did not apply for the specialty. Of the 134 that applied, 42 (31.4%) were not approved, 83 (61.9%) continued in the HC-FMUSP and nine (6.7%) were able to find positions in other institutions (Table 3).

Table 3. *Result of the specialty access exam – FMUSP (2014-2016).*

Approved for HC-FMUSP	61.90%
Approved for other institutions	6.7%
Non-approved	31.4%

As for the expectations after residency in the specialty, 53.3% intended to continue in São Paulo, 11.9%, to work in the interior of the State, and 26.2%, to return to the State of origin. Still as plans for the future, 68.3% intended to attend Strict-Sense Post-Graduation.

DISCUSSION

The General Surgery residency of the Clinics Hospital of FMUSP offers an expressive number of vacancies, and the profile of selected residents has been changing in recent years. The candidates are young, with an average age of 25.8 years, and 25.7% are female. This number is considered significant when compared with the percentage of women who had opted for surgery two to three decades ago. The most sought after specialties for women are Plastic Surgery, followed by Vascular Surgery. Since its implementation in 2006, the Advanced General Surgery Program has trained 58 residents, of which only nine (15.5%) were women. Even though women represent almost 50%, sometimes even more, of medical students, the option for General Surgery is not proportional, because excessive workload interferes with family life. In addition, due to the lower number of women surgeons in relation to men, and the fact that few of them hold leadership positions, there is a lack of models or examples that serve as stimuli for others to follow the surgical career[6,10] .

The number of candidates per position remains constant despite the indiscriminate opening of medical schools, many of which have not yet formed their first class, but surely the number of candidates should increase in the coming years. We should note that students from schools with a deficit structure do not normally enroll in the HC-FMUSP contest, as the probability of approval is small due to the significant demand, the high level of the exam and the application costs. Thus, it is not surprising that 84.4% of residents come from Public Schools, of which 68% have completed training in the Southeast region. However, it may be surprising that only 34.7% of the residents are students graduating from FMUSP, unlike in the past, when most of the places were occupied by them. Two aspects may explain these data: first, that in 2011, there was an increase in the number of vacancies for General Surgery, from 36 to 48; second, the decrease in the number of students who choose the specialty. On average, 20 to 30 students opt for General Surgery, and even if all pass the exam, vacancies would always be left for students from other Colleges. However, this is an open competition, and HC-FMUSP has distinguished itself by selecting excellent candidates from different Medical Schools and regions of the Country. In the United States, there has been a gradual decline in the demand for General Surgery by students in the end of the undergraduate course, falling from 12% to 6%[8]. Kleinert

et al.[6] analyzed the questionnaire responses sent to 1,098 medical students in Germany and found that 14% had plans to choose a surgical specialty.

As already mentioned, this demand is decreasing due to several aspects. The choice is focused on the specialties that allow a better style and quality of life than that determined by the General Surgery, which involves a long time of training, intense dedication in the care of critically ill patients, prolonged period confined in the operating room and countless shifts. Interestingly, that these aspects did not seem to have as much relevance in the past.

Of the residency graduates in General Surgery in the United States, only 30 to 40% act like general surgeons. The option is for other specialties, with a growing tendency for "mini or sub-specialties"[5]. The surgeon who in the past saw the patient as a whole now acts in a certain body segment, when not in only one organ, or in the care of an exclusive disease. One striking fact is the tendency for the surgeon to specialize early, which is the subject of continuous discussion by several surgical entities, including the American Surgical Association and the American College of Surgeons[11,12]. Due to the extraordinary technological advance, the "Halstedian" of training that has formed countless generations of skilled surgeons must be modified, incorporating the new achievements, especially the practice in laboratories and simulators[13,14]. We are in the era of video-surgery and robotics, which is the present and future of surgery. Because of scientific advancement, technology and the development of medical knowledge, new and young doctors aspire to be "super experts". The trend towards sub-specialization is inevitable. Among the several factors, one contributing aspect is the presumed inverse relationship between the surgical volume of a surgeon and the rate of operative complications and mortality. Patients want to be treated in centers of excellence and by surgeons with expressive experience on specific diseases[9,15,16].

Approximately 50% of the selected residents had encouragement to choose the specialty during the undergraduate course, through participation and help in operative procedures linked to a surgeon or surgical team. At the beginning of training, 75.8% of them already showed preference for the specialty to which they would apply at the end of the second year of residency. This has been referred to as frequent, since usually at the end of the undergraduate course the student has already defined the specialty to pursue. However, 49.5% of the residents changed their choice after completing all the stages in the different disciplines. In recent years, Plastic Surgery and Urology, along with Digestive System Surgery, have been the most sought after areas among the nine offered at the end of training. More than 60% of the residents who completed the two years of General Surgery at HC-FMUSP chose them. However, we have observed in recent years that of the 48 residents who complete the training, only eight to 12 (20%) make the option for Digestive Surgery or General Surgery Advanced Program (the greater number for the former), the remaining 80% opting for other specialties.

In the Medical Residency Program in Brazil, there are crucial problems. Thirty percent or more of the undergraduate students do not have access to any residency program, since the number of positions is less than the number of graduating physicians. The options for those who do not have access to residency are enrollment in the Armed Forces, work in the Family Health Program, outpatient clinic/health clinic or in emergency care/emergency room. This, as a rule, occurs without the doctor still having adequate training for the professional exercise. Another issue is the fact that 30% of those who finish the General Surgery residency do not have access to the specialty because the number of scholarships is also lower, which determines a bottleneck in the training program. The option is to work as a General Surgeon, especially in Emergency Room, waiting for a new attempt to complete training in the near future. In this way, they work in one of the most complex and challenging areas of surgery, which is emergency surgery, forced to make quick decisions and face complex procedures for which they are not adequately trained. Coleman *et al*.[15], in working with residents after five years of training, found that 38% of them did not feel prepared or confident for General Surgery practice. Even after a long training time, training may be incomplete. In Brazil, the situation is even more complex, given the limited quality of many programs and the time devoted to training the surgeon. In recent

years, there has been a concern about the effectiveness of training in order to make residents confident and competent, especially after reducing workload. This has generated studies analyzing different aspects of resident education and training[17-22].

In our area, Santos and Salles[23,24] developed a way to evaluate the technical ability of General Surgery residents that will receive the specialist title at the end of the program. They selected surgical procedures of small, medium and great difficulty. The conclusion was that the proposed evaluation is objective, practical and easy to apply. The assessment of technical ability and knowledge are fundamental in the qualification and certification of the surgeon.

Regrettably, Brazil is perhaps the only country in the world that grants the title of Specialist in General Surgery after only two years of residency. Of the two years of training, excluding the two months of vacation, there remain 22 that are distributed in ten or 12 areas/specialties, and on average 40 to 45% of the total workload is related to the stage in the General Surgery Service. In fact, it is a residency of "Surgery in General" and not of General Surgery. In this analysis, one should also consider the reduction of the workload for 60 hours per week, further reducing the resident's stay in the Hospital. This was the subject of a recent editorial of the journal of the Brazilian College of Surgeons, entitled "Will two years be enough?"[25]. The award of the title of specialist in General Surgery, the broadest area of Surgery, after a period of short and insufficient training, deprives the formation of the General Surgeon. In countries of the European Union and in the United States, the recognition of professional qualification is linked to training of four to six years and the performance of a number of operative procedures. HC-FMUSP offers 46 vacancies for the nine surgical specialties. As many candidates opt for the same specialty, and because it is an open contest, the number of non-selected is significant. Of the residents who completed the two years of training, 31.4% were not approved, and 61.9% remained in the institution. Those who are not selected are among those who have applied for the most popular specialties. Regarding the perspectives, more than 50% intend to remain in São Paulo, including those from other states. A strict post-graduate degree is in the plans of almost 70%.

It is disturbing for a resident to consider these initial two years of training as a means of passage to the specialty. This explains the position of not showing interest or enthusiasm for procedures that are more complex and for the care of critical or complicated patients. The resident does not want to act on procedures that he/she may never see or perform again. These observations are most evident in the second year of residency, especially in the second semester, when the selection exam for the specialty is nearing. The resident is more concerned with studying for the test than with learning. The other surgical specialties depend on General Surgery for education, clinical practice and research[8].

Another aspect to emphasize is that the significant majority understands the 60 hours of work per week as sufficient. However, this time is considered inadequate for surgical training, and the resident has the right to interrupt activities once this workload limit has been reached. The reduction of the workload aims to offer the resident time for rest or study, but it is common the practice of paid night shifts outside the educational institution, compromising the normal activities of the following day.

This study presents limitations, since it evaluates the population of a single institution, in a short period of time, and with limited number of residents. Although amenable to criticism, it certainly reflects the current state of the General Surgery residency in our midst. In view of the residents' profile, it is necessary to review the training time for the General Surgeon's training, as well as to discuss the need for the test to enter the specialty. We should reflect if direct access to the specialties would not be a more effective attitude from the economic point of view and for the Surgeon's formation.

We conclude that the current residents' profile, when compared with the not-so-distant past, reveals a reduction in the demand for General Surgery, a trend towards early definition of the specialty, options for increasingly specific or restricted areas, and an activity that offers better quality of life. The analysis of this study reflects the characteristics of the general surgery resident, which are probably related to the inherent values of the current generation.

R E S U M O

Objetivo: verificar o perfil dos residentes de Cirurgia Geral do Hospital das Clínicas (HC) da Faculdade de Medicina da Universidade de São Paulo (FMUSP). **Métodos:** foram avaliados os residentes aprovados no concurso do Programa de Residência Médica em Cirurgia Geral do HC-FMUSP nos anos de 2014, 2015 e 2016. O estudo foi realizado por meio de coleta de dados de questionário e informações obtidas da Comissão de Residência Médica da Instituição. Foram analisados: dados da identificação, origem do candidato, escola da graduação, ensino cirúrgico recebido, razão da escolha pela Cirurgia, expectativas na residência, escolha da especialidade futura e pretensões ao término da residência médica**.** Também foi analisado o resultado do exame de acesso às especialidades. **Resultados:** a média de idade foi de 25,8 anos, sendo 74,3% do sexo masculino. A maioria (84,4%) cursou a graduação em escolas públicas, sendo 68% no Sudeste; 85,2% dos residentes foram aprovados no primeiro concurso. A escolha da especialidade estava definida em 75,9% no início da residência, porém 49,5% mudaram ao longo do treinamento. Cirurgia Plástica, Urologia e Cirurgia do Aparelho Digestivo foram escolhidas por 61,5%. Consideraram adequadas as 60 horas semanais 83,3%. Eram favoráveis ao acesso direto à especialidade 27,3%. Ao término da especialidade 53,3% pretendiam continuar em São Paulo e 26,2% retornar ao Estado de origem. A pós-graduação *stricto sensu* era pretendida por 68,3%. **Conclusão:** o perfil atual do residente revela redução na procura pela Cirurgia Geral, definição mais precoce da especialidade, opções por áreas cada vez mais específicas e uma atividade que ofereça melhor qualidade de vida.

Descritores: Internato e Residência. Educação Médica. Especialidades cirúrgicas. Escolha da Profissão.

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