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Survey of training and education of cytotechnologists in Europe

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Objective: This report presents the results of a survey of the training and education of cytotechnologists (CTs) in 15 European countries and suggests guidelines on which future education should be developed.
Methods: A questionnaire was sent to 25 countries in 2011: 14 with and 11 without a European Advisory Committee of Cytotechnology (EACC) member or representative. We received responses from 18 countries, among which three were excluded from the survey because they did not have CTs in training.
Results: The number of fully trained and employed CTs in these 15 European countries varied from 35 to 2600. The level of responsibility for most CTs in 14 of these countries was intermediate (signing out negative and inadequate gynaecological samples), whereas seven also had a minority of CTs at an advanced level (signing out abnormal gynaecological samples). Basic education was equally divided (7/8) between countries requiring a bachelor degree or training in medical technology before entry into cytology training. The training in cytology was given as a separate course/education or a combination of separate courses and in-house training, but was often confined to gynaecological cytology. It was recognized that CTs should extend their activities with the advent of human papillomavirus (HPV) testing and vaccination. The training requirement for CTs was usually decided by the national professional society. Most cytology training programmes were accredited by academic institutions at university level and were recognized nationally in almost all of the countries. For most of the countries, the optimal education in the future should be at university level with a diploma in cytotechnology certified or accredited by the European Federation of Cytology Societies.
Conclusion: The survey showed variation in basic education and cytology training, especially with respect to non-gynaecological cytology, although graduate entry was favoured. The role of CTs is changing and the education and training programmes need to adapt to these changes.

Keywords: training, education, cytotechnologists, Europe, human papillomavirus, vaccination

Introduction

The education and training of cytotechnologists (CTs) is a challenge all over the world. In the last decade, with the introduction of human papillomavirus (HPV) testing and vaccination, it is predictable that, in the future, there will be modification in the cervical screening programmes with a substantial reduction in the number of cervical specimens. The introduction of these new primary screening methods represents a potential challenge for modifications in the CT training programmes. We believe that ancillary techniques as well as non-gynaecological cytology should be included in training to develop multiskilled and flexible CTs for future needs in cytopathology.[1–4]

A survey of training and education in Europe was executed by the members of the European Advisory Committee of Cytotechnology (EACC) in 2006, as was done for medical training.[5] An updated overview was needed to obtain information that could help to harmonize the training and education of CTs in Europe. A survey for practising CTs in different

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European countries was launched to provide a basis for the establishment of future general guidelines for minimum requirements for training and education. The EACC, which is under the auspices of the European Federation of Cytology Societies (EFCS), executed a survey in 2010 and in 2011 with a revised questionnaire.

Materials and methods

A questionnaire, based on that used in the EACC survey in 2006, was prepared by the current EACC members at that time. The survey was executed in spring 2010 and the results were presented at the EFCS meeting during the 17th International Congress of Cytology in Edinburgh in May 2010. The questionnaire used in this survey was discussed at the meeting and it was decided to improve the questionnaire by adding some questions, specifying other questions, which could be confusing and, most importantly, including documentation on who responded to the questionnaire.

The updated, extended and revised version of the questionnaire was sent to 25 European countries in 2011 (14 countries with an EACC member and 11 countries with EFCS members but no EACC representative). From each country, one representative CT or medical doctor was responsible for the given answers: Austria (J. Stani), Belgium (F. Willocx), Croatia (V. Anic), Denmark (D. Ejersbo), Finland (S. Ihalainen), France (H. Debaque), Germany (R. Schulzke), Greece (I. Anagnostopoulou), Italy (C. Alphandery), Norway (M. L. Eide), Portugal (M. Praca), Slovenia (I. Srebotnik Kirbis), Spain (M. Santamaría), Sweden (A. Domanski), Switzerland (S. Hintermann), the Netherlands (R. Salet-van de Pol), Turkey (B. Önal) and the UK (A. Wilson).

The survey was divided into five parts: basic education, training in cytology, accreditation and certification, continuing education, including quality assurance, and suggestions for optimal education. The questions included issues related to the numerical state, academic level and required number of slides examined under supervision prior to signing out cervical cytology cases.

Results

We received answers from all 14 representatives from countries that were EACC members (Austria, Belgium, Croatia, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Slovenia, Sweden, Switzerland and the UK) and the following countries without an EACC member at that time: Greece, Portugal, Spain and Turkey. We did not receive answers from Albania, Hungary, Macedonia, Poland, Romania, Russia or Slovakia. The replies from Italy, Greece and Turkey were excluded from this survey because: (1) we did not receive a completed questionnaire from Italy; (2) in Greece, cytotechnology is not an official profession and screening is performed by cytopathologists; (3) in Turkey, cytotechnology is not an official profession, although a few biologists (<20) with an MSc or PhD are practising as CTs in some gynaecology and private laboratories. This left 15 countries with replies, all except two of which had an EACC representative. The approximate number of fully trained and employed CTs in different European countries varied from 35 to 2600 (Table 1).

The level of responsibility (Table 1) for the majority of CTs in 14 of the 15 countries was at the intermediate level (report and sign out negative and unsatisfactory cervical cytology specimens, undertake rescreening and offer a differential diagnosis of abnormal specimens). Denmark, Finland, Germany, the Netherlands, Sweden, UK and Portugal also had a minority of CTs at an advanced level (report and sign out normal and abnormal cervical cytology specimens), whereas Austria, Finland, Norway, Portugal and the UK additionally had CTs at the basic level (cannot report or sign out cytology specimens).

Basic education

The basic educational standard requirement for entry to cytotechnology training is either a medical/laboratory technologist or biomedical scientist with a bachelor degree (Table 1). In Austria, Denmark, Finland, France, Norway, Slovenia and Sweden, it is only possible to enter cytotechnology training with a bachelor degree; however, a bachelor degree is not mandatory in Belgium, Croatia, Germany, the Netherlands, Portugal, Spain, Switzerland or for cytoscreeners in the UK. Subjects that are generally included in the basic education are cytology, cell biology, molecular biology and/or biochemistry. We do not know whether the requirements for obtaining a bachelor degree are the same in each country.

Table 1. Approximate number of fully trained and employed cytotechnologists (CTs) in different European countries

Country (number of CTs)	IAC	QUATE	Level of responsibility	Education before CT training	Nature of CT training	Accreditation of CT training
Austria* (300)	22 (7.3%)	32 (10.6%)	Basic, 13 Intermediate, 280	University of Applied Science bachelor degree**	In-house; gyn only allowed	University; only gyn
Belgium* (±300)	Few (–)	Few (–)	Intermediate	MLT and/or 3-year bachelor or masters degree	In-house; gyn only allowed	Not recognized
Croatia* (225)	0 (–)	0 (–)	Intermediate	High school or university bachelor degree	Separate course; gyn & non-gyn	Degree
Denmark* (175)	19 (10.8%)	≈ 130 (≈ 74.3%)	Intermediate, 165 Advanced, 10	3-year bachelor degree	In-house only	IAC and QUATE
Finland* (±200)	40–50 (20–25%)	0 (–)	Basic, some Intermediate, some	University of Applied Science bachelor degree	Separate and in-house; gyn only allowed	Not recognized
France* (±800)	17 (2.1%)	0 (–)	Intermediate	MLT – bachelor degree	Separate course gyn & non-gyn	University
Germany* (2600)	Few	German exam similar to QUATE	Intermediate, ≈ 2450 Advanced, ≈ 150	MLT – high-school	Separate and in-house; gyn only	Certificate
Netherlands* (600)	107	Few	Advanced, 300 Intermediate, 300	Secondary/high school +/– bachelor degree	Separate course; gyn & non-gyn	High school
Norway* (130)	20 (15.4%)	20 (15.4%)	Basic, very few Intermediate, most	3-year bachelor degree	Separate and in-house; gyn and non-gyn	University
Portugal ≈ 90	60	20	Basic/inter-mediate, most Advanced, few	MLT	Separate and in-house; gyn and non-gyn	80 Registered with Cytology Society
Slovenia* (35)	0 (–)	1 (2.9%)	Intermediate	3-year bachelor degree	Separate course; only gyn	Certificate
Spain	10–15 (–)	No data	Intermediate	Technicians	Separate course; gyn & non-gyn	Diploma
Sweden* (220)	18 (8.1%)	5 (2.3%)	Advanced, 20–29 labs Intermediate, all labs	Medical technologists – master degree	Separate course; gyn & non-gyn	University Degree
Switzerland*	Number not known	Number not known	Intermediate (most)	MLT	Separate course; gyn & non-gyn	Certificate of proficiency
UK* (±1300)	No data	No data	Basic, 20 Intermediate, 1250 Advanced, 65	MLT and 3-year bachelor degree (except gyn cytoscreeners)	Separate and in-house; gyn only	Diploma

IAC, International Academy of Cytology; QUATE, Committee on Quality Assurance, Training and Education; gyn, gynaecological cytology; non-gyn, non-gynaecological cytology; MLT, medical laboratory technician/technologist.
*Countries with European Advisory Committee of Cytotechnology member.
**Courses offered for CTs and other professions.

Training in cytotechnology

The training in cytology is given as a separate course in seven countries (Croatia, France, the Netherlands, Slovenia, Sweden, Switzerland and Spain). In five countries (Finland, Germany, Norway, UK and Portugal), it is possible to have training/education as part of a general programme of in-house training in the laboratory and as a separate course. In three countries (Austria, Belgium and Denmark), education is given as part of a general programme of in-house training in the laboratory. The duration of training in cytology as part of a general programme of in-house training in the laboratory varies from 3 months up to 2 years. In most countries, gynaecology cytology is associated with non-gynaecology cytology in the education. In five countries (Austria, Germany, UK, Portugal, Slovenia), gynaecology cytology is separated from non-gynaecology cytology in the training. The duration of training in gynaecology cytology is from 30 to 120 credit points, or 90 to 165 hours. The duration of training in non-gynaecological cytology (only a few answers) is from 20 to 180 credit points, or from 3 months to 369 hours. The duration of joint training is from 30 to 120 credit points, or from 100 to 640 hours. The possibility of joining just one part of the education (only education for gynaecology cytology) is accessible in seven countries (Austria, Belgium, Finland, Germany, Norway, UK, Portugal), but not possible in seven countries (Croatia, France, the Netherlands, Slovenia, Sweden, Switzerland, Spain). Subjects included in the curriculum are mostly gynaecology and non-gynaecology cytology, staining methods, molecular techniques, and also considerable variation in anatomy, pathology, histology, quality assurance, etc.

The academic level possessed by instructors/training officers at workplaces varies from senior CTs, members of staff with master or bachelor degrees, with International Academy of Cytology (IAC) examination certificates, cytopathologists and pathologists. The required number of slides screened with supervision before the CT trainees can sign out cervical specimens is from 770 to 7000, but mostly around 1000. The approximate number of persons training to be a CT varies from three up to 25 each year.

Who decides the training requirements for CTs in the country? In six countries, it is a professional society, in three the ministry of education, the government in two and not specified in four countries.

Accreditation and certification

Cytology training programmes are accredited by an academic institution at university level in six countries (Austria, France, Norway, Spain, Sweden and Portugal) and at high school level in one country (the Netherlands). In other countries, cytology training programmes are accredited by other institutions, such as professional societies, ministry of health or education and institutions that carry out the above-mentioned training; in one country, training is without accreditation. Training programmes are recognized nationally in almost all of the countries, except Belgium and Finland, where training programmes are not officially recognized.

Students who complete the training programme are awarded a diploma in France, the Netherlands, Norway, Spain, Switzerland and UK, a degree in Croatia, Finland and Sweden and a certificate of competence in Austria, Belgium, Denmark, Germany, Portugal and Slovenia. In Denmark, the certificate of competence is provided by a Committee on Quality Assurance, Training and Education (QUATE) examination.

Continuing education and quality assurance

With regard to arrangements and strategies for continuing education in cytology, almost all countries have annual meetings and courses that are usually not mandatory, but are mandatory for all staff reporting cervical cytology in the UK and Norway. Congresses are also represented in most of the countries, but are not mandatory. The other options accessible are slide seminars, one-day meetings and workshops. Table 1 summarizes the number of CTs who have taken and passed the examinations of QUATE and IAC.

On the question, 'Is the EuroCytology website learning platform widely used in their countries?', all participants answered that this platform was not widely used in their countries.

An organized external quality assurance (EQA) scheme is running in the following countries: in Finland, Germany, Sweden and UK once a year; in the Netherlands every 1–3 years; in Croatia and Austria on a voluntary basis; in Slovenia four times a year but only for immunocytochemistry; in Spain four times a year; and in Switzerland once every second year. Belgium, Denmark, France

and Norway did not have an EQA running when the survey was executed.

What is the optimal education?

Finland, the Netherlands, Norway, Switzerland and Portugal believe that they have optimal or close to optimal education of CTs. All the other countries answered that they do not have the optimal education of CTs in their country and believe that the optimal education will be at university level. Each participant had the opinion that a diploma certified or accredited by EFCS would, or probably would, enhance the acknowledgement of CTs in Europe.

Discussion

The results of this survey are a summary of the existing and accessible education and training of CTs in 15 European countries. We believe that a bachelor degree in biomedical/laboratory science should be the minimum requirement before entry into cytotechnology training. Although it seems that this is the minimum requirement for most of the CTs in the respondent countries, we do not know whether the requirements for obtaining a bachelor degree are the same in each country. This needs to be investigated further. The competence level of basic education is important to achieve a certain standard before training in cytology in order to develop CTs for the future needs in cytopathology. The situation in the other European countries is unknown and the EACC is trying to recruit members from these countries.

In the authors' opinion, this study reveals a very clear and alarming rate of inaccessible and inadequate training of CTs in some European countries, especially with respect to non-gynaecological cytology. As a result of the introduction of new methods, which CTs, according to the authors, could perform, it is necessary to insist on an efficient, harmonized and complete education (gynaecological, non-gynaecological and additional methods) of CTs in Europe. The authors propose basic education for the future generations of CTs at the university level of laboratory/biomedical science (bachelor degree) and at least 1 year of training in cytotechnology, which should be accredited by EFCS. EACC members are working on preparing the plans and training programmes for CTs in Europe.

Conclusion

The results of this survey provide valuable information on the current situation of cytotechnology training and education in 15 European countries. We have discussed the similarities and differences in these European countries, as well as suggestions for the development of optimal education based on the current needs and deficiencies. The survey also provides EACC with the basis for developing recommendations for minimum requirements for the education and training of CTs in Europe, including suggestions for a general curriculum (gynaecological cytology, non-gynaecological exfoliative cytology and fine needle aspiration cytology, including ancillary techniques). The role of CTs in Europe is changing, and the education and training programmes need to adapt to these changes.

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