PARTICIPANTS' OPINION ON ANTWERP SUMMER SCHOOL ON VACCINOLOGY

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ABSTRACT

Antwerp University was formed of three institutions, currently with over 20,000 students, of which 19% are from other countries. In addition to the many courses and educational programmes offered, the Antwerp University organizes several summer schools on various topics. One of these is the summer school on vaccinology for students. This year's edition brought together two groups of foreign participants of which some were students of an international master programme (Erasmus Mundus Leading International Vaccinology Education, LIVE), and some were students or graduates in medicine, biology, biochemistry, public health and other related fields. The courses were very well organized and the themes varied from the epidemiology of infectious diseases and the effectiveness of different immunization programmes to information about the immune system. Several vaccines have been discussed, with information concerning the prevention of infection, their mechanism of action, efficacy, mode of administration and possible side effects. The courses were completed by workshops on vaccine administering, communication and on how to prepare a presentation.

Keywords: summer school, vaccinology

REZUMAT

Universitatea Antwerp a fost formată din trei instituţii, în prezent având peste 20.000 de studenţi, dintre care 19% sunt din alte ţări. Pe lângă numeroasele cursuri şi programe educaţionale oferite de Universitatea Antwerp, aceasta organizează şi câteva şcoli de vară pe diverse teme. Una dintre acestea este şcoala de vară despre vaccinuri pentru studenţi. Ediţia din acest an a reunit două grupuri de participanţi străini, o parte erau studenţi ai unui program internaţional de master (Erasmus Mundus Leading International Vaccinology Education, LIVE), iar o parte au fost studenţi sau absolvenţi de medicină, biologie, biochimie, sănătate publică şi alte domenii relaţionate. Cursurile au fost foarte bine organizate, pornind de la epidemiologia bolilor infecţioase şi eficienţa diverselor programe de imunizare, până la informaţii despre sistemul imun. Au fost luate în discuţie mai multe vaccinuri, fiind prezentate informaţii referitoare la infecţia prevenită, mecanismul lor de acţiune, eficienţă, mod de administrare şi posibile reacţii adverse. Cursurile au fost completate de organizarea unor sesiuni de activităţi practice privind administrarea vaccinurilor, comunicare şi realizarea de prezentări.

INTRODUCTION

The University of Antwerp is relatively new and it was formed from three institutions: Universitaire Faculteiten Sint-Ignatius Antwerpen, Rijksuniversitair Centrum Antwerpen and Universitaire Instelling Antwerpen [1]. The first two were founded in 1852 and focused on trade and economy, especially due to the existence of the Port of Antwerp [1].

Approximately a century later they became universities, each with additional courses [1]. Shortly after the founding of the third institute, in 1973, they began to cooperate under the name of the University of Antwerp, and since 2003 they have started to function as in the current form, reaching over 20 000 students, of which 19% are international students, coming from 116 countries [1].

The Summer School on Vaccinology for Students

Antwerp Summer University offers several summer courses, addressing diverse themes from applied economy to law and vaccines. One of these is the Summer School on Vaccinology for Students. The group organizing this course, now in its ninth edition, is located at the Centre for the Evaluation of Vaccination.

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The Summer School on Vaccinology organized by the University of Antwerp this year brought together two groups of students, one part were participants of an international master programme (Erasmus Mundus Leading International Vaccinology Education, LIVE), and the others had different fields of activity, from medical students to doctors, graduates of public health, biotechnology or biology and related fields. This year's participants were from several countries, including: France, Greece, Turkey, Italy, Armenia, Albania, Georgia, Bulgaria, Spain, Slovakia, Ukraine and others. The number of participants was under 50 and organizers took care to balance the gender and country of origin of the participants (Fig.1). When registering for this school, students can apply for a scholarship; the deadline is at the beginning of May. The trainees of this summer school were very diverse regarding their background and had different levels of experience in the field, which probably was a challenge for the organizers also due to the fact that the group was larger than in other years.

Beside the professors' involvement, two PhD students were very committed in organizing the summer school, offering complete information about the course and advising the participants on certain scientific issues.

The organization also involves volunteer students from the European Medical Students Association - Antwerp. They are in charge of answering all the questions of the participants before their arrival about the logistics of the accommodation, weather how to get from and to the airport, if it is better to take the bus or train or any other queries. They also take care of the participants, they help them get to the campus, and every day they offer them a small social program. After courses, they organize short visits to the city and present information regarding the history of places and buildings or stay in the campus and discuss on various themes.

Not only the university is involved in the organization of the summer school but also the representatives of the mayoralty. One evening at the beginning of the summer school, the representatives gave a short speech about the city, about the university and about the possibilities offered by them.

The structure of the summer school included courses, vaccine administration workshops, communication skills improvement sessions and team work.

Courses took one week and were held at the Campus Drie Eiken of the University of Antwerp, Belgium. They were organized at the beginning of July, addressing both students and graduates in medical and related science domains. The courses were held by professors from Antwerp University and other experts from across Europe. The courses were diverse, managing to address several vaccines one at a time, discussing each one from an epidemiological point of view and their mechanism of action.

The summer school provided information on the various actions taken by the World Health Organization (WHO) to improve immunization and what would be the targets at the moment.

After presenting the importance, effectiveness, impact, and targets of vaccination programmes, the courses addressed topics such as the immune system, providing an informational basis from which we

could refresh or improve the knowledge of how certain vaccines work, making it especially useful considering the participants different backgrounds, and the fact that a basis is needed in understanding the topic. Courses have had a logical succession, with the most widely used vaccines being presented. The teaching mode of each course was very detailed and very well organized starting from the description of the infectious agent, to the possible consequences of the infection, to the type of vaccine, the mode of administration, possible adverse reactions, the vaccination rate in various parts of the world and recent research directions. One of the courses concerned vaccines that are not usually introduced into the national vaccination programme of most countries and are recommended for those who travel to certain areas of the globe. What was more interesting was explaining and exemplifying how to think when discussing with a person who will travel to a particular area, how to present the dangers and how to make a decision whether to recommend a specific vaccine or not.

The complexity of the vaccines research, development, and manufacturing was addressed during the summer school as well. The case of influenza vaccine was a good example, due to the particular complexity of this vaccine, where there is a need of worldwide strain surveillance by WHO in order to decide which viral strains should be part of the next season formulation and to alert of any pandemic strain, but also how the pharmaceutical companies are able to produce the vaccine in a race against the clock, how an egg free vaccine production can solve future issues and satisfy an eventual high demand, how the change from trivalent vaccine to the recommended quadrivalent vaccine has increased the vaccine efficacy. Moreover, the use of adjuvants for antigen sparing in pandemic influenza vaccines, and the possible future use of intradermal vaccination and vaccine patches were discussed along with the Phoenix of influenza vaccination that will be the development of a protective vaccine with the shared epitopes from the M2 and HA proteins.

In another course the vaccine hesitancy was tackled along with the use of more effective ways to communicate with people who hesitate to vaccinate their children or themselves, their reasons and how to handle the situation in different cases. After that course, we had a little group work, where we had to prepare various themes on how to act especially in terms of communication. For example, one of the groups had to present how they would implement the Human Papilloma Virus (HPV) vaccination in a school, especially on how they would inform the parents and what they would convey, which would be their information plan. The participants presentation was not only with regard to vaccine procurement, but they also thought about making posters about HPV infection and vaccination, small informative leaflets and also having meetings with the parents to discuss, expose fears and receive answers about their concerns. Also, the diversity of nationalities provided different points of view concerning their own country and situation. It was clear that even the same vaccine requires personal communication and in some cases also country to country communication. One clear example was the case of the HPV vaccine, where an approach that was valid for some students from Belgium, France or Spain was not for other students from countries such as Pakistan, Iran or Lebanon which proposed a different approach due to their cultural differences.

In addition to courses, the summer school also included a hands-on workshop on how to administer a vaccine with the most common way of administrations in vaccination that is intramuscular injection; during the course other methods of administrations were taught such as intradermal and their potential benefits as antigen sparing were also discussed. During the practical workshop, we were divided into small groups and under the supervision of a person in the organization first we were told how to properly administer an intramuscular vaccine from how to prepare what we need up to how to dispose of the needles and so on. After the explanations, we made injections under guidance in a manikin or on each other.

After each course the students were asked to complete an anonymous evaluation form in order to assess their knowledge level, what they would like to find out and their opinion regarding the course [2].

The course evaluation was based on different activities. Firstly, the students had to elaborate a brief report before the beginning of the course about the national vaccine schedule, policy and what kind of Polio vaccine is used nowadays in their own countries and if the vaccine had changed recently and the cause behind. The final examination of the participants consisted on a set of multiple choice questions related to the content discussed during the course and also a final presentation. The presentation was done by groups, each group having a specific theme, for example one had to expose the problem of measles and congenital rubella syndrome in their own countries. The final presentation also included

a practical part called "elevator pitch" where one participant in each group would try to persuade a person to vaccinate itself or vaccinate their child in 2-3 minutes maximum, the time that would be available in a real situation. The discourse was supposed to be convincing in a short time and to be realized as a discussion between two people meeting in an elevator.

I think it was positive to change the composition of the working groups for each activity, having the opportunity to get to know each other better and to improve the ability to work with people we have not worked with until then.

Another strong point of the programme was the opportunity to build a good network, where we were able to have and keep the contact with people all around the world and also with different roles in the vaccinology fields, from professors, PhD students and workers in the field of vaccinology, to international students with different backgrounds. All of us shared an interest in infectious diseases, immunology, microbiology, health policy and vaccinology, and this network will be useful in our future careers.

From the participants opinions

From the point of view of a medical microbiologist at the beginning of my training, the summer school was an important point. I have been able to understand better and have a more general, wide and complex view of the dynamics of infectious diseases and the various vaccination programmes. Currently, I teach microbiology classes to the students of the Carol Davila University of Medicine and Pharmacy in Bucharest, Romania. I believe that the information gathered in this summer school has helped me better understand how immunization programmes function and therefore I am better prepared to explain to students why some programmes work in some WHO regions, while in others could not be applied and many more. Each country has a role in epidemics because an infectious disease is driven not by the infected people, but by those who are vulnerable. For these reasons, we need an immunization plan and well established actions in such situations, because there are still many issues to solve. Also, when I participated in an epidemiology symposium in Romania, possible new epidemic outbreaks in Europe were discussed and when talking about poliomyelitis and what research is being done in the field; the polio research unit 'poliopolis' was mentioned, which we had the opportunity to visit at the Antwerp University campus.

Another aspect that I think the summer school has been of real use was regarding my PhD thesis, which I have recently started. Participating in these courses made me see its structure differently and the course I will follow in its development.

From the point of view of a biotechnologist studying in the pharmaceutical branch, it was a truly forming experience. The summer school shifted me a lot from what my formation was. I am usually led to analyse and act with, predominantly, molecular approaches in the medical and biological sciences. In particular on the subject of vaccinology, our focus is, in a reductive exemplification: pathogen, vaccine and try to obtain the best possible profile of safety and efficacy for the products on which we work.

But even reaching the highest standards for vaccine production, the immunization programme, sometimes is not as effective as the product itself.

The comparisons that we had, between intra- and extra-European geographical areas that are very distant from each other, were very important, as we have had a lot of different ways of dealing with vaccination in different countries and with successful results.

All this has led me to reflect on how an effective immunization programme necessarily includes more parts and professional figures for a certain population, which brings with it a specific historical and cultural background to consider but also taking inspiration from what has led others to success.

As a scientist, I am often more focused on the organic aim by forgetting that, broadly speaking, we work with the person. Thanks to this experience, I started thinking much more about the human factor in what is the equation of the fight against infectious diseases.

Finally a special mention is required for the Summer School on Vaccinology. This year, 23 students from the Jenner Promotion (2016-2018) of the Master Erasmus Mundus Leading International Vaccinology Education (LIVE) participated for the first time in the Summer School on Vaccinology. The LIVE programme is a European Master approved by EACEA, where the students have to study for 2 years in at least 3 different European countries (Spain, Belgium and France) and in 5 different universities (UA, UJM, UCBL, UB and UAB) and they are awarded with 3 different degrees plus the supplementary European Diploma. The first semester of the master starts in Barcelona, Spain where the students enroll in the national Master Advance Immunology given by the UB and UAB.

In this period of 5 months, from September until January, the students acquire a good knowledge in immunology that is required in the vaccinology field. Afterwards, in February, the students move to Antwerp, Belgium in order to start the second semester, where they are trained in tropical and infectious diseases, an introduction in clinical trials and regulations and also two weeks of training in the Pharmaceutical Company GSK, ending the first year of master with the Summer School on Vaccinology in Antwerp. Later on, in September, the students start their second year of master in Lyon, France where they obtain a better knowledge in communication on vaccines, epidemiology and project management. In this semester the students have also a course on vaccines formulation at the University of Laussane, Switzerland and at the pharmaceutical company Sanofi Pasteur, France and another course in preclinical and clinical trials at the CEA (The French Alternative Energies and Atomic Energy Commission). Finally, the last semester is dedicated for the development of the master thesis, where the students can decide to do their internship in different companies, research centres or universities all around the world, for instance the Butantan Institute in Brazil, the University of Arkansas for Medical Sciences in the United States of America, the CNRS in France or the pharmaceuticals companies Sanofi-Pasteur in France, Merial in France, GSK in Belgium or Janssen in the Netherlands are some examples of places where the students are going to start their internship from February until July. During the whole programme the students develop personal skills such as the capability to adapt to other cultures and places, team-work in multidisciplinary environments due to the diversity of the background of the LIVE students (Biotechnologists, Biomedical Engineers, Biologists, Medical Doctors, Veterinarians and Pharmacists etc. among other). These experiences provide to the students all the elements, skills and training necessities to build the future generation of vaccinologists.

From the point of view of a current student of the Master LIVE, I consider the programme as a unique opportunity with high quality professors, exceptional organizing universities and excellent partnerships in which we can find more than 47 institutions including several big pharmaceutical companies that provided not only theoretical knowledge but also the applied and practical knowledge necessary in the field of vaccinology. All together make the LIVE master the perfect choice for those people that are interested in applying the scientific knowledge in immunology, microbiology, infectious diseases, but also other transversal fields such as health policies and communication (For more information related with the Master LIVE visit: http://live.univ-lyon1.fr/). Personally, I highly recommend the summer school on vaccinology because I consider it an exceptional course where the students can have a week of intense and deep training in vaccinology, where all the main points are discussed and provided to the students, making it an unforgettable experience.

CONCLUSIONS

What helped our development were not just the classes and group activities, but also our discussions between us outside the courses and the establishment of the links between people with quite different backgrounds, learning out about each other's education or research systems.

The Summer School on Vaccinology is not just a week of classes; it does not end after the exam but continues through the network established between the participants and the organisers, connecting people from different areas of the health sector and from very different domains. This is extremely useful for international cooperation and forms a basis for the scientific development itself.

Conflict of interests

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