

Special themed issue: Education in clinical chemistry and laboratory medicine in various European countries

The state and the problems of the education in the sphere of clinical laboratory diagnostics in Ukraine

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Abstract

The question of the medical laboratories staff training is currently in the focus of attention in Ukraine. Laboratory technicians with a college degree are prepared in the medical colleges for two or four years depending on school educational level. During their practice they are assessed every five years on completing the additional improving course. The position and their job responsibilities are defined by the Ministry of Health Protection. Bachelors of clinical laboratory diagnostics (CLD) are trained in medical universities obtaining the appropriate license. The position and their job responsibilities are similar to laboratory technicians' ones. The CLD specialists are prepared by the CLD departments in the medical academies of postgraduate education or medical universities' faculties of postgraduate studies. Those graduates, who have already acquired a degree in Medicine or Biology are eligible for the training program. Biologists pass courses of specialization for five month whereas doctors pass the specialization for ten month including four month practice. If the doctors wish, they can do the masters degree program within doing the specialization. However, because their position and job responsibilities are not determined by the Ministry of Health Protection of Ukraine, masters are allowed to practice their profession at the level of specialists. The specialists that practice clinical biochemistry, laboratory immunology, microbiology and medical genetics have to take the additional appropriate two-three month specialization courses. During their practice, specialists are assessed every five years. For assessment the commission takes into account the quantity of credits that a specialist has received within five years. Credits are earned for attending the scientific conferences, publishing scientific works, books or handbooks, professional training and pre-assessment module courses. The position and their responsibilities are defined by the Ministry of Health Protection of Ukraine. Currently there is no system in Ukraine for higher academic education for professionals in clinical laboratory diagnostics. We are aware of this fact and are committed to the improvement of the Ukrainian teaching clinical laboratory diagnostics system.

Key words: clinical laboratory diagnostics; laboratory staff; education

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Introduction

Clinical laboratory diagnostics (CLD) is a wide medical scientific discipline which encompasses different disciplines and fields in different countries. In Ukraine, within the scope of the profession of Clinical laboratory diagnostics are the following fields: laboratory hematology, clinical cytology, clinical biochemistry, laboratory immunology, laboratory coagulation and hemostasis, microbiology, medical laboratory technology and quality control management.

CLD as the science and as the profession is dedicated to:

- provide the use of the all possible laboratory methods for diagnosis and prevention, to estimate the treatment's efficiency and safety; ensure dynamic monitoring; remission control; assess disease recurrence and prognosis;
- the standardization of the laboratory methods according to internationally accepted standards and recommendations;

- assure and manage the quality of pre-analytical, analytical and post-analytical phases in the laboratories at all levels.

Education

The profession of CLD is regulated by the Ministry of the Health Protection. Following legal issues are defined:

- the scope of the CLD profession and the area of its sub-specializations: clinical biochemistry, laboratory immunology, medical genetics and microbiology;
- types of graduates, that are allowed to be trained in CLD;
- calendar plans, study programs, topic plans, course-books and workbooks for teaching medical professions;
- rules and orders concerning medical institutions' staff competences and responsibilities;
- medical professions list that are allowed for teaching in the concrete educational institution.

All medical institutions, private laboratories and medical educational institutions have to be licensed by the Ministry of the Health Protection.

Laboratory technicians with college education are prepared in the medical colleges. Persons, who have incomplete (nine years) school education are trained for four years and complete (11 years) one for two years. Every five years they complete the improving courses and the assessment for the second, first, and eventually for the higher qualification category or confirm the previous one. Laboratory technicians are assessed by the special committee that is organized by region Health Protection Office.

Bachelors in CLD are earning their graduate degree at three universities which are licensed by the Ministry of Health Protection of Ukraine: two medical schools: Chernovtsi National Medical University and Dniepropetrovsk National University and one faculty of pharmacy: Zaporizhzhia State Medical University. The position and Laboratory technicians' and bachelors' job responsibilities are deter-

mined by the Ministry of Health Protection of Ukraine. They have to have knowledge of:

- documents that regulate medical institutions' activities, laboratories' work organization, their rights and responsibilities;
- basis of common medical and clinical disciplines;
- blood and other main cells morphology, parasites' ovum, main gelminths' kinds, *Gonococcus*, *Treponema pallidum*, *Trichomonas*;
- biomaterial taking, keeping and transporting rules;
- preparing of patients to the laboratory examination;
- reagent's, paint's, nutritious mediums preparation principles;
- disinfection, sterilization, aseptic, antiseptic rules;
- regular laboratory indexes and their changes main clinical significance;
- safety rules;
- etiology, pathogenesis, symptoms of the most extended diseases;
- first aid rendering rules;
- using medical remedies in urgent cases rules;
- anti epidemic regime rules;
- medical documentation drawing up rules.

Laboratory technicians' and bachelors' job responsibilities are:

- to do physical chemical analyses of blood, cerebrospinal fluid, stomach contents, sputum, urine, feces, gelminthological analyses;
- to define glucose, bilirubine, protrombine, nitrogenous blood concentration, amylase blood and urine activity;
- to do liver tests;
- to take, keep and transport biomaterial;
- to prepare reagents, nutritious mediums, chemical crockery;
- to have the skills of the working with laboratory equipment;
- provide the anti epidemic regime, safety;
- to draw up the medical documentation.

Vocational training (specialization)

Vocational training of specialists in clinical chemistry and laboratory medicine in Ukraine is not fully in accordance with European Syllabus (1,2). The CLD specialists are trained by the CLD departments in the medical academies of postgraduate education or medical university's faculty of postgraduate studies. Only graduates who have successfully acquired a degree in Medicine or Biology can be trained as specialists in CLD. Biologists pass courses of specialization for five month whereas doctors pass specialization for ten month, including four months of practice. Having passed the exam these persons get the specialist in CLD certificate. The certificates are issued by the committee delegated by the educational establishment where the specialists were trained and passed the exam. The examination includes computer tests, practice skills and oral exam. Each student gets the examination card that contains three questions. After preparing for 20-30 minutes, the student answers the questions in front of the examination committee. Assessment is done according to the following five-range scoring system: *excellent, good, satisfactory, not satisfactory, has not answered*.

Upon the choice of an individual resident, medical doctors may enter the master's degree program during their specialization. However, because their position and job responsibilities are not determined by the Ministry of Health Protection of Ukraine, masters are allowed to practice their profession at the level of specialists. The doctors who specialize in CLD may take the position of doctor-laborant, whereas the biologists who specialize in CLD can work as a biologist. Their responsibilities and duties are similar.

The specialists who practice clinical biochemistry, laboratory immunology, microbiology and medical genetics must take additional appropriate courses of specialization for two-three month. Those courses are provided by the medical faculty within the program of postgraduate education. They are taught according to the special programs that include more detailed theoretical and practical points of appropriate discipline than they pertain to common specialization program. After passing

these courses specialists have more knowledge and extended scope in their sub-profession. After passing the exam this persons get the appropriate certificate: specialist in clinical biochemistry (take position of biochemist); specialist in laboratory immunology; specialist in microbiology (take position of microbiologist); specialist in medical genetics (take position of laboratory genetic). The certificates are issued by the committee delegated by the educational establishment where the specialists were trained and passed the exam.

Every five years the specialists have to undergo the periodic assessment examination according to their specialization. Specialists are assessed by the committee delegated by the regional Health Protection Office. Within the assessment, the number of credits that specialist has received within five years are taken into account. Credits are earned for attending the scientific conferences, publishing scientific works, books or handbooks, professional training (half-one month) and the pre-assessment module courses (one month) in the medical academies of postgraduate education or faculty of postgraduate studies.

So, all Ukrainian specialists in CLD pass specialization covering the main laboratory diagnostic fields. Then some of them may further subspecialize in basic CLD, including laboratory hematology, clinical chemistry and clinical cytology. Some of them specialize and improve in clinical chemistry, laboratory immunology, microbiology, or in medical genetics. Unfortunately, specialists are not taught in drug monitoring. These investigations are not widely used in Ukraine. However in addition, those specialists, who subspecialize in common CLD do the laboratory diagnostics of pulmonary diseases, including breath condensate testing, genital diseases and serous cavities diseases. Also they do cytological investigations of inflammatory, pre-tumor and tumor (cancer) diseases of different locations.

The CLD specialists who have higher qualification category can take the position of the laboratory's head. Those who have finished the two-year postgraduate practical training or masters are preferred.

The common specialists' number in Ukraine is about 4.000, 1.500 of them are doctors-laborants (having basic medical education) and about 2.500 – biologists, microbiologists, laboratory genetics (having basic biology education). The laboratory technicians' number is 23.000.

There is one main specialist in CLD in every City and Regional Health Protection Office and one in the Ministry of Health Protection of Ukraine. There are two public professional organizations in Ukraine; Ukrainian Society of Clinical Laboratory Diagnostics (USCLD) and AllUkrainian Association of Clinical Chemistry and Laboratory Medicine (A(U)ACCLM). The both organization membership is voluntary. All mentioned specialists can be the members of any or both organizations.

The USCLD activity is mostly scientific and methodological. It has just existed for 40 years. This society accounts 214 members. The membership is represented by scientists, teachers, main specialists, laboratory Heads, quality specialists. It is the member of IFCC (for about three years) and EFCC (two years).

The A(U)ACCLM is younger, it has existed for four years. It has mainly organizational and professional legal activity. The A(U)ACCLM accounts about 1500 members. Organization's membership is represented by scientists, teachers, as well specialists of state and private laboratories, private firms that deal with laboratory equipment, reagents e. c. The A(U)ACCLM is not the member of IFCC and EFCC.

Academic education

The issue of academic education in CLD attracts the particular attention in Ukraine. Currently there is no system in Ukraine for higher academic education for professionals in clinical laboratory diagnostics. We are aware of this fact and are committed to the improvement of the Ukrainian teaching clinical laboratory diagnostics system.

Furthermore, there are no specialized bodies who may serve as the committee for defending the PhD thesis in CLD in Ukraine. Therefore, the specialists in laboratory medicine have to complete dissertations in other medical or biological fields. Luckily, several bodies in clinical biochemistry and immunology have just being established.

According the points, that have been described below the following steps are considered to be of utmost importance:

- harmonizing the system of education according to Bologna declaration (educating at the bachelor and master degree);
- setting up of the specialized bodies entitled to serve as the PhD assessment committee in CLD;
- defining the competences, responsibilities for the master's position by the Ministry of Health Protection.

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Školovanje na području kliničko laboratorijske dijagnostike u Ukrajini

Sažetak

Školovanje osoblja medicinskih laboratorija trenutno je u središtu pažnje u Ukrajini. Laboratorijski tehničari sa završenom srednjom školom obrazuju se na medicinskim višim školama dvije ili četiri godine ovisno o stupnju školskog obrazovanja. Svakih pet godina organizira se dodatan tečaj stručnog usavršavanja za provjeru stručnosti. Opis radnog mjesta i odgovarajućih odgovornosti definira Ministarstvo za zdravstvenu zaštitu. Sveučilišni prvostupnici kliničko laboratorijske dijagnostike (CLD) školuju se na medicinskim sveučilištima kako bi dobili odgovarajuće odobrenje za rad. Opis njihovog radnog mjesta i odgovornosti slične su onima laboratorijskih tehničara. Specijalisti kliničko laboratorijske dijagnostike obrazuju se na katedrama za kliničko laboratorijsku dijagnostiku medicinskih akademija za poslijediplomsko obrazovanje ili sveučilišnim medicinskim fakultetima na poslijediplomskim studijima. Nakon završetka diplomskog studija iz medicine ili biologije moguće je uključiti se u program specijalističkog usavršavanja. Biolozi pohađaju specijalističke tečajeve u trajanju od 5 mjeseci, dok specijalizacija za doktore medicine traje 10 mjeseci u što je uključeno četveromjesečno razdoblje specijalističkog staža. Ukoliko to žele, doktori medicine mogu unutar specijalizacije završiti i magisterij. Međutim, budući da njihov opis radnog mjesta i odgovornosti ne definira Ministarstvo za zdravstvenu zaštitu, kao magistri mogu vršiti djelatnost na istoj razini kao i specijalisti. Specijalisti koji se bave kliničkom biokemijom, laboratorijskom imunologijom, mikrobiologijom i medicinskom genetikom moraju proći dodatne dvo-tromjesečne specijalističke tečajeve. Tijekom specijalističkog staža, svakih pet godina se organizira provjera stručnosti. Kod provjere komisija uzima u obzir broj bodova koje je specijalist sakupio tijekom petogodišnjeg razdoblja. Bodovi se mogu dobiti prisustvom znanstvenim konferencijama, objavljivanjem znanstvenih radova, knjiga ili priručnika, stručnim usavršavanjem i pohađanjem pripremnih stručnih modularnih tečajeva. Opis njihovog radnog mjesta i odgovornosti definiran je također od strane Ministarstva za zdravstvenu zaštitu Ukrajine. Trenutno u Ukrajini ne postoji sustav za više akademsko obrazovanje stručnjaka kliničko laboratorijske dijagnostike. Svjesni te činjenice želimo poboljšati Ukrajinski sustav školovanja na području kliničko laboratorijske dijagnostike.

Ključne riječi: kliničko laboratorijska dijagnostika; laboratorijsko osoblje; školovanje