DEBATE AND EDUCATION

Undergraduate medical education in Slovakia — present state and future needs

Hanacek J

Department of Pathological Physiology, Jessenius Faculty of Medicine, Comenius University, Martin, Slovakia. **hanacek@jfmed.uniba.sk**

Abstract

There is a lot of problems related to undergraduate medical education (UME) at Slovak medical schools, e.g. low level co-ordination and integration of curriculum, isolation of teaching subjects, amateurish teaching methods, low level of management, which result in low level of effectivity, late and insufficinet reactions to the needs of medical practice. There is urgent need for complex reform of UME if we like to be able to complete with high quality medical schools in Europe. The reform should be focused to the content of curriculum — to integrate prventive and acute medicine into the UME, to improve training of medical students for service in primary health care, to start with renaissance of humanistic education of medical students, to improve research training and teaching of medical informatics. For improving organisation of UME it is necessary to prepare modern profile of graduates from medical school, and from the profile to derive co-ordinated and integrated system of UME. The teachers at medical school should be professionals not only in medical specialization, but in pedagogy, psychology and management, too. Passive forms of education (e.g. lectures) should be partly substituted by active methods, e.g. problem — based learning. More attention should be devoted to elaboration of criteria for evaluation quality of teaching process. The reform of UME have to be done if we like to have a chance to be as good as the best medical schools in Europe. I believe, we want it all! ***(Ref. 31.)***

Key words: undergraduate medical education, reform of curriculum content, changes in organisation of teaching process, modern forms of teaching, co-ordinated and integrated system of undergraduate medical education, profile of graduates.

The discussion related to present state and future of undergraduate medical education (UME) at Slovak medical schools (SMS) started recently thanks to initiative of medical students. The main outcomes of the discussion up to now are:

a) academic staff and medical students are not satisfied with the present state in content, organisation, and educational methods used in UME,

b) there is urgent need to start with systemic reform of UME at medical schools in Slovakia.

The urgent need for reform of UME at Slovak medical schools is based on the following arguments:

— the philosophy and economics of health care in Slovakia was changed profoundly during the last 10 years,
— the negative tendencies in health state of our population are growing up,
— rapid developments in medical science itself result in better understanding of pathogenesis of diseases,
— developments in andragogic and possibilities for their application in UME,
— development of new information technologies and their use in medicine.

The and probably another arguments should support the activities directed to reform present system of UME.

Department of Pathological Physiology, Jessenius Faculty of Medicine, Comenius University, Martin Slovakia

Address for correspondence: J. Hanacek, MD, PhD, Dept of Pathological Physiology, Jessenius Faculty of Medicine, Comenius University, Sklabinska 26, SK-037 53 Martin, Slovakia.
Phone: +421.43.428213, Fax: +421-43.4134807

The author gratefully acknowledge M. Ilovska and M. Vrabec for invaluable technical assistance in preparation of manuscript.

According to my own experience I can say that during the last 40 years SMS developed quantitatively and qualitatively, but there were no significant changes in system of UME. Due to this UME still suffers from low level of effectiveness, low level of co-ordination and integration UNE content, there is still very strong trndency to isolationism and particularism of teaching subjects, and amateurish teaching methods are used. Part of the mentioned problems roots in history of SMS but some of them are the consequence of inadequate criteria used in evaluation of medical schools. Despite the education is one of the three main activities of medical schools, it is still underestimated. Academis staff alibistically relies on intellectual ability of medical students, on their working capacity, on their ability to learn individually without necessity to develop special teaching methods, because students are able to elaborate them without teacher's help. According the results of SMS one can see that students are able to fulfil this aim, but the cost that they have to pay for it is high, and quality of UME is lower than it can be, and than is should be. I think that time is coming when scientific methods should be used not only in medical research, but in UME, too. Underestimated approach to teaching process at SMS is expressed in non-existence of conception of UME, and the system for assessment quality of education process is absent, as well.

Taken all of the mentioned problems into account I came to conclusion that UME have to be reformed fundamentally.I can support my conclusion by many papers published in Europe and other parts of world, in which idea of UME reform is stressed. A lot of „old" excellent and „young" medical schools have changed content, organisation, and teaching methods of UME (Buchannan, 1985; Davis, 1986; Jonas et al., 1991; Davies, 1991; Fraser, 1991; Brearley, 1992; Black, 1992; Metz et al., 1994; Murray, 1995; Rotem et al., 1996; Benbassat, 1996; Richardson and Norris, 1997; Neufeld, 1998; Haag et al., 1999; Grimer and Danoff, 2000). An important activities devoted to new trends in medical education do exist at 3rd Medical School of Charles University in Prague (Höschl, 1991; Andel et al., 1997; Horak and Höschl, 1999). Thanks to international conferences devoted to UME, which took place in Bratislava (1997), Kosice (1999), and Martin (2000) we obtained information on the latest trends in UME in Germany (Rimpau and Wiedersheim, 1997), in Schwitzerland (Gordon, 1999), in Netherlands (Hlavaty, 1999), in Hungary (Szekeres, 2000) and in Finland (Hakkarainen, 2000).

These and many other informations support my belief that effort devoted to reform of UME in many medical school over the world is not a matter of fashion but the result of pressure originated in medical practice. This pressure is high and permanent, so e.g. Harvard medical school cannot withstand it and it transformed UME during 1982—1987 years, too (Leeder, 1991).

The complex reform of UME at SMS is not possible without collaboration and co-operation of medical schools with Ministry of Education, Ministry of Health, Slovak Medical Chamber, Slovak Medical Association of Private Doctors and some other representatives of medical practice. Collaboration of all mentioned subjects should result in creation of modern conception of UME at SMS for 21st century. At a time economic hardship at universities and medical schools, financial constraints provide the perfect rationalization for continuing inactivity. As „hard times" are likely to be our lot for the foresseeable future, accepting this argument will postpone to an infinitely distant date any hope of change (McCormick, 1986). I fully agree with this conclusion of General Medical Council related to UME reform in Great Britain, and I think that SMS are now precisely in the described position.

Reform of undergraduate medical education — proposals

The reform of UME in Slovakia should be complex, it means that content, organisation and teaching methods have to be changed. By my meaning the change of UME content should be the first step in the reform. The content have to meet new demands of medical practice.

Changes in content of UME

I am sure that it is necessary to start with serious preparation of medical student in preventive medicine. There is a need to develop the ability of medical students to think prevention and after graduation to put that prevention into practice. Our UME and pattern of health care is still predominantly hospital — based, high — technology diagnosis, treatment and management. A.M. Davis (1986) put down the idea that such a philosophy should be completely turnaround. The doctor's role should be seen as much a health facilitator as a mere sickness salvager. Present and future philosophy of health care and UME can be expressed according Davis (1986) by „drowning" analogy — „Increasingly resource — intensive, crisis — intervention approach has been ôikened to the frustrating business of trying to save a never — ending succession of drowning people from a fast — flowing river. Surely, it is more sensible to look upstream and to concentrate one's effort on finding ways of stopping them falling in, in the first place. The best way for improving preparation of medical students in the field of preventive medicine is that prevention should pervade the whole UME, whatever the topics or speciality. There is not necessary to create new subject „preventive medicine". It will be more effective to integrate it into UME. Such an integrated approach would permanently remind the student the role of lifestyle in risk behaviour, environment in risk exposure, and of the part to be played by doctors in achieving a shared understanding with the patient as to acknowledge the risks, and reduce them. This conception precisely defines the position of preventive medicine in UME at SMS, too. For improvement teaching of preventive medicine is necessary to focus attention of medical teachers to better undersstanding of „aetiology of health" and pathogenesis of diseases. Deep knowledge on „aetiology of health" will help doctors to promote health, and better understand the pathogenesis of diseases will improve ability of doctors to prevent onset of diseases.

Current medical education in Slovakia pays only lips — service to health promotion and prevention of diseases. One can say that teaching prevention is something like an „adnexum" of

classic UME. If we like to change this position of preventive medicine, we have to prepare modern programme of teaching the preventive medicine — its modern content, organisation and teaching forms. In this process the attention have to be paid to selection of topics and to total extent of programme to avoid overhelming capacity of medical students and to exceed the framework of UME.

I am afraid that preparation of medical students for management of acute life-threatening health events at SMS is not good enough. My doubts arise from information obtained by questionnaire filled up by graduates from medical school at Martin in 1980s. The main complaint of young doctors was partial insufficiency in theory and praxis of solution life-threatening health situations. This problem can be solved by elaboration of precisely defined programme of acute medicine teaching — its content, teaching methods, organisation, departments responsible for teaching specific topics. Elaboration of programme does not mean creation of new autonomic subject, e.g. „acute medicine", but rather, the content of programme should pervade the whole medical study, especially its clinical part. Such integration of acute medicine into UME can improve preparation of medical student for their role in medical practice.

The primary responsibility of medical schools is to prepare their students for their careers. Medical schools must take note of employyers' views. So, curriculum should reflect the working practices and patterns of the most graduates — it means general practitioners. Now, the curriculum tends to reflect working conditions characteristic for hospital consultant despite less than 10 % (approximately) of students will end up working in such an environment. Such a content of UME is losing its existing priority (Black, 1992). There is clear shift of attention to primary health care, now. So medical schools have to atteempt to increase the relevance of the UME by introoducing more primary care into curriculum. This will be accompanied by profound changes of existing UME. New content of UME should be defined, firstly, and than similar with teaching preventive and acute medicine, integrated it to the curriculum. There is not need for creation new subject of UME called „primary health care".

I think that UME cannot be regarded as complete when it does not involve teaching programme focused to social sciences. I am afraid that present absence of serious humanistic education of medical students at SMS may have negative consequences for quality of newly qualified doctors. This is the reason why there is a time for renaissance of humanistic education at SMS. The academic body of SMS is informed very well about importance of social, psychological and behavioural factors in pathogenesis of disease processes. So, it is a role of medical schools to stress this factors in UME. The medical student can then understand the etiopathogenesis of diseases more complexly.

Few would dissagree that, in addition to having technical skills and knowledge, today's physicians need to be humanists, need to be good communicators (Neufeld, 1998). The curricula of most modern medical schools now include a course on the doctor—patient relationship. Education in social sciences gives to medical students a chance to enlarge their knowledge on human — being, especially in the field of his social dimension, in communication skills, and it enables them to create more complex view on patient. Such an approach gives the patient a belief that physicians are cared for as individuals in their own right (Neufeld, 1998).

I think that the first step to renaissance of social and behavioural sciences in UME is to prepare minimal teaching programme related to this field and introduces it into the undergraduate medical curricula. It is on the medical schools what will be the content of this programme, but I think that some topics from large spectrum of social and behavioural sciences (e.g. sociology, gerontology, medical anthropology, psychology, philosophy, economics of health) should be involved in the mentioned programme.

It is a role of medical schools to educate medical students on the scientific basis, and prepare them for practice in the environment of evidence based medicine. Every medical doctor knows that medicine is partly science, and still partly the art, but medical art should root in the scientific information and not in unauthenticated and irrational conceptions. This is only one effective way how to hinder invasion of non-scientific methods into medicine, and into UME, too. Scientific education of medical student requires good scientific environment at medical schools. This can be created if there is enough money for research and if management of medical schools supports the research. I am convinced that high quality of UME can't be without high quality of research. Research work is one of the most important factor involved in increasing quality of medical teachers, in development of teaching subjects, in development of international collaboration, which all bring new impulses into the educational process.

Another important way, which can lead to improvement of scientific education of medical students, is students research work. It is necessary to change the contentand organisation of this activity if it would have to fulfil the mentioned mission. Firstly, it is necessary to change it from elective to generally accessible activity for students. By this way the studfent research work became integrative part of UME. It means that for this activity will be created space and time in curriculum. I am sure that student can be useful members of research teams not only at medical school but at other research institutions, too.

Another important role of medical schools, at this time is to prepare the students for use the information technologies in learning and in medical practice. To fulfil this role medical schools have to elaborate programme devoted to teaching of information technologies generally, and medical informatics particularly. In the process of formulation of content of such programme we can't forget that medical informatics is a tool (very effective, but tool, only), which should support and promote medical education and medical practice. The graduate from medical schools have to be prepared to use adequately information technologies because they invade to education processes, and to processes related to health care, as well (Mesko, 2000).

Changes in organisation of UME

What kind of changes should be performed in organisation of UME? The present state in organisation of UME at SMS can be characterised by isolationism of teaching subjects and particularisation of curriculum.

The mentioned state is not compatible with modern conception of UME because its effectiveness is low, and it is not focused on preparation of medical students for complex solving of patients health problems. This system should be replaces by modern one, e.g. co-ordinated and integrated systeem (CIS).

Co-ordinated and integrated system of UME contain intrinsic potential for improvement quality of education process and its result-newly qualified doctors (Hanacek, 1997). It is posssible to mention here some parts of the intrinsic potential of CIS:

a) CIS gives a chance to create UME as rational and integrated system,

b) it contains elements, which increase effectiveness of UME,

c) CIS is flexible system able to meet the needs of medical practice very quickly,

d) CIS renders possible to utilise rationally financial, per sonall and material sources allocated into educational process.

How the term CIS can be defined? It consists of two parts — co-ordinated system and integrated system. I think that co-ordinated system is a method used in organisation of UME, by which the elements of curriculum can be rationally set in order to create the system co-ordinated horizontally, vertically and temporally.

Integrated system is another organising method used for direction of teaching process to solving real medical problems, and to change of atomised UME to effective interdisciplinary co-operation.

Elaboration such a system is unndoubtedly complicated task, but more complicated will be its application into the UME. Realisation of both these tasks need good will of academic authorities of medical schools. They should create such a milieu at the medical schools, which is suitable for realisation of changes in UME. There are several obstacles that made realisation of reform in organisation of UME quite difficult:

a) UME itself is very complicated,

b) teachers' approach to any proposala directeed to changes of UME is predominantly conservative,

c) it is quite difficult to define precisely the border between undergraduate and postgraduate medical education,

d) present isolationism of teaching subjects resists to effort for because it is well feed by subjective ideas of some heads of departments about exclusiveness and superiority of their subjects in the system of UME,

e) educational aim of SMS was, and still is not well defined.

The key point in the CIS is the profile of graduates from medical schools (PGMS). It originates in logic of any rational activity of human — being. First step in such activity is idea, conception what we would like to do, what is the aim of our activity. The next step is looking for means and tools by which the defined aim can be reached. My question is whether SMS can reach their aim — to educate graduates of high quality, when they haven't precisely defined their profile? Another my question is whether can be created high quality system of UME, when there is not defined educational aim? My answer to both question is — no! This is the reason why I recognize elaboration of detailed profile of graduates from medical school as first — rate aim on the way to modernisation of UME at SMS. This view is supported by experience coming from abroad, e.g. from Netherlands (Metz et al., 1994).

I think that PGMS can be defined as follows: It is the documented which state the extent, structure and depth of knowledge, state the scale ofpractical skills in diagnostic and therapeutic process, and state attitudes with respect to medical functioning (Hanacek, 1997, 1999).

The PGMS possesses the potential to influence positively the whole UME, because:

a) it creates essential condition for creation of clearly defined educational aim of medical school,

b) it enables to create partial educational aims for teaching subjects and school years,

c) it renders possible to choose rational methods and tools for reaaching of educational aim,

d) accreditation body, wide public and students can compare the declared educational aims and their fulfilling by medical schools,

e) it renders possible to plan and to use of financial and other sources allocated to educational process more rationally and more precisely,

f) it creates the essential condition for elaboration of horizontally and vertically co-ordinated UME.

I suppose that PGMS and CIS derived from it have the potential to become of the skeleton of UME at SMS in near future. One can consider this idea very optimistic. My optimism originates from belief that we take into account an example of well working healthy human body when we will create the new system of UME. The teachers at medical schools are well aware that human body is functioning well when all its parts function well and function of all parts is precisely co-ordinated and integrated. Shortly — function of different parts of the body should be subordinated to the function of the whole body as whole.

It is not easy to understand why we are able to accept the human body as co-ordinatea and integrated system, but we ignore the validity of the same principle for organisation of UME. We still think that system of UME can function effectively without precise co-ordination and integration of its parts. I am convinced that it is impossible alike it is impossible in the human body. I suppose that UME, which is not well co-ordinated and integrated, can't reach high level of quality even when its parts (teaching subjects) are at high level and teachers are specialists.

The question is who should create the PGMD. I think that medical schools have to guarantee its elaboration, but another institutions and their representatives should collaaborate on it (e.g. Ministry of Education, Ministry of Health, Slovak Medical Association, Slovak Medical Chamberm Association of Private Doctors, and some others).

Changes in teaching methods

What kinds of changes should be made in teaching methods used in UME? I suppose that classic forms of teaching, e.g. lectures, seminars, practical sessions, will be still in the armament of teachers because their validity was confirmed by time. Because of changed educational environment there is need for enter a new teaching methods in UME. We have more knowledge on educational method used in adult people, there is invasion of modern information technologies into UME, there is an incredible growing availability of reliable information (Mesko, 2000), which revolutionise medical education.

These new possibilities enable medical teachers to choose teaching method according the content and aim of teaching unit, so teaching methods should be more variable and more flexible.

Teaching methods and forms can't be amateurish in future. Today's teachers at SMS are mostly amateurs, without pedagogic education and most of them is convinced that they don't need such an education, at all. We now know that this idea is not true, because the educational activities at medical schools can't be based on empirism and inherited talent for education, only. These two modalities should be supported by knowledge of modern educational method, and by enthusiasm. The teachers armed by such an armament will be able to increase effectiveness of educational process, which can manifest as increasing retention of knowledge, as increasing of range and quality of manual and intellectual skills, as increased ability of graduates to solve real health problems.

First paper related to standards of quality of medical teachers (profile of medical teachers) was published in Slovakia recently (Kukurova et al., 2000). New standards take into account special medical and pedagogic knowledge, respectively.

Medical teacher of 21st century should be enthusiast well educated in pedagogy and medicine. He/she must be able to use classic and modern educational methods, as well, e.g. computer assisted instruction programmes, web-based training programme, simulated and/or virtual patients, power-point system and others. Using the new methods, we have to be aware of potential dehumanisation of clinical preparation of medical students.

In modern UME should be clear shift from passive teaching and learning methods to active ones, among which problem-based teaching is at the first position. This method is very appropriate for teaching medicine (Hlavaty, 1999; Hakkarainen, 2000) and I am convinced that it has a potential to be the main form of teaching at medical school in near future.

Effective functioning of problem-based teaching requires creating better conditions for students to study individually. Some extent of classic teaching methods can be replaced by individual controlled study.

The proposed system of UME at SMS can be successful when its quality will be permanently monitored and controlled. Unfortunately, creation of appropriate criteria that enable us to evaluate quality of education process objectively is very complicated. But, Nutter et al. (2000) recently showed that the problem is soluble. So, there is not unsurpassed hindurance ahead of our way to evaluate quality of UME at SMS, too.

I believe that thanks to movement which we can observe during the last three years around UME at SMS, we will be able to reform it profoundly in near future. There are a lot of positive examples at medical school in Europe that can help us in our effort. Whether the reform will start, and what will be its result, it depends on the willingness of academic staff of medical schools to improve UME. If they would like to do this than reform can bring very positive fruits for medical schools, medical students and health care. I am optimist; this is why I believe that SMS will try to solve the problem related to reform of UME, all together.

References

Andel M, Hoschl C, Horak J, Rokyta R, Svoboda D, Rychterova V: Fundamental reform of undergraduate medical education at 3rd Medical School of Charles University. Book of abstracts. 1st Slovak Conference on Medical Education, Bratislava 1997, 10 p.

Benbassat J: Teaching the social sciences to undergraduate medical students. Isr J Med Sci 1996; 32: 217—221.

Black N: Research, audit, and education. Brit Med J 1992; 304: 698—700.

Brearley S: Medical education. Brit Med J 1992; 304: 41—44.

Buchanan N: Medical education — some thoughts for the future. Med J Austr 1985; 142: 639—642.

Davies PG: Problems with training for general practice in South Australia. Med J Austr 1991; 155: 457—459.

Davis AM: The teaching of preventive medicine. J Royal Soc Med 1986; 79: 629—631.

Fraser RC: Undergraduate medical education: present state and future needs. Brit Med J 1991; 303: 41—43.

Gordon P: Reform of undergraduate medical education at Basel, and individual tutorial. Book of abstracts. 2nd Slovak Conference on Medical Education, Kosice 1999, pp. 15—17.

Grimer PF, Danoff D: Sustaining change in medical education. J Amer Med Ass 2000; 283: 2429—2431.

Haag M, Maylein L, Leven FJ, Tonshoff B, Haux R: Web-based training: a new paradigm in computer-assisted instruction in medicine. Int J Med Inf 1999; 53: 79—90.

Hakkarainen K: The components of reformed medical curriculum. Book of abstracts. 3rd Slovak Conference on Medical Education, Martin 2000, pp. 34.

Hanacek J: Importance of profile of graduates for management of medical school. Book of lectures. Seminar on Management and administrative structures of Higher Education Institutions, Bratislava 1997, pp. 60—63.

Hanacek J: How the elaboration of profile of graduates can help to create co-ordinated and integrated system of undergraduate medical education. Book of abstracts. 2nd Slovak Conference on Medical Education, Kosice 1999, pp. 5—7.

Hlavaty T: Problem-based study at Medical School of Mastricht University. Book of abstracts. 2nd Slovak Conference on Medical Education, Kosice 1999, pp. 14.

Horak J, Hoschl C: Fundamental transformation of curriculum at medical school after two years. Book of abstracts. 2nd Slovak Conference on Medical Education, Kosice 1999, pp. 11—13.

Hoschl C: Evaluation of scientific, educational, and therapeutic activities of teachers at medical schools. Cas Lek Ces 1991; 130: 474—476.

Jonas HS, Etzel SI, Barzansky B: Educational programs in US medical schools. J Amer Med Ass 1991; 266: 913—920.

Kukurova E, Bernadic M, Holomanova A, Javorka V, Duris I: Professionalism of teachers holding the appoointment at scientific and clinical departments at medical schools. Bratisl Lek Listy 2000; 101: 412—414.

Leeder SR: The new partway in general medical education at Harvard Medical School. Med J Austr 1991; 155: 740—743.

McCormick J: Preventive medicine. J Royal Soc Med 1986; 79: 625—626.

Mesko D: Appliance and information technologies versus patient, versus physician—teacher, versus student (reality or science fiction?) Bratisl Lek Listy 2000; 101: 675—683.

Metz JCM, Stoeelinga GBA, Rijcken EHP: Blueprint 1994: Training of doctors in the Netherlands — Objective of undergraduate medical education. University Publication Office, University of Nijmegen, The Netherlands, 1994, 163 p.

Murray TJ: Medical education and society. Canad Med Ass 1995; 153: 1433—1436.

Neufeld VR: Physicians as humanist: still an educational challlenge. Canad Med Ass 1998; 159: 787—788.

Nutter DO, Bond JS, Coller BS, D'Alessandri RM, Gewertz BL, Nora LM, Perkins JP, Shomaker TS, Watson RT: Measuring faculty effort and contributions in medical education. Acad Med 2000; 75: 199—207.

Richardson ML, Norris TE: On-line delivery of continuing medical education over the world-wide Web: An on-line needs assessment. Amer J Roentgenol 1997; 168: 1161—1164.

Rimpau W, Wiedersheim R: Is it possible to change medical education? Experience of the University Witten/Herdecke. Book of abstracts. 1st Slovak Conference on Medical Education, Bratislava 1997, p. 18.

Rotem A, Bloomfield L, Southon G: The clinical learning environment. Isr J Med Sci 1996; 32: 705—710.

Szekeres P: Cornestones of improvement in clinical skills training. Book of abstracts. 2nd Slovak Conference on Medical Education, Martin 2000, p. 22.

Received June 20, 2001.
Accepted August 17, 2001.