JECA

J Expt. & Clin. Anat. 10 (1)1-3

Trends in Anatomy Education

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ABSTRACT

The teaching of anatomy is undergoing changes world-wide. What to teach, how to teach and who teaches are now subjects of controversy. Traditional anatomy education based on didactic lectures and complete dissection of the body appears to be giving way to Problem-Based learning (PBL), Systems Based Learning (SBL) and the use of computers and many other teaching tools. These need proper evaluation before their wholesale adoption.

Most, however, agree that cadaver dissection should be retained by medical schools as it has obvious advantages.

Key words: Anatomy education; problem-based learning; systems based learning; traditional education; cadaver dissection.

The teaching of Anatomy is changing. Many medical schools, world wide, are moving away from dissection and lectures to a more integrated course where basic sciences and clinical skills are taught simultaneously especially anatomy (K. Hinduja, et al 2005).

How much to teach, how to teach and who teaches have become subjects of much controversy (Heylings D.J. 2002).

The traditional anatomy education based on topographical structural anatomy delivered by didactic lectures and complete dissection of the body appears to be giving way, in many medical schools, to a multiple range of study modules (Older J 2004). These include Problem-Based Learning (PBL), Systems-Based Learning (SBL), use of computers and many other teaching tools.

Problem-Based Learning (PBL)

This was pioneered by McMaster University in Canada in 1969 (Heylings D.J. 2002). The system is now adopted by many medical schools especially in North America and the United Kingdom. Students work together in small groups on a set scenario. They share existing knowledge and understanding relevant to the scenario and agree on learning objectives.

The system is student-centered and demands a lot of motivation on the part of student. The teacher acts as a facilitator during discussions.

Systems-based Learning (SBL)

The teaching is based on body systems (Heylings D.J. 2002). For instance, in teaching the digestive system, all aspects are taught at the same period. This will include the anatomy, physiology, pharmacology, biochemistry, genetics and clinical skills relevant to the system.

The Integrated System

Basic Sciences are taught concurrently with clinical studies.

Subject-Based Learning

This is the traditional method where anatomy, biochemistry and physiology are taught independently. This is still the standard method of teaching of Anatomy and other basic sciences in Nigeria.

Assessment of the Various Learning Systems

Problem-Based Learning (PBL) has been adopted by many medical schools world-wide as the educational and philosophical basis of their curriculum. Several studies have shown that PBL is an important educational strategy for integrating the curriculum, motivating the students and helping them to identify their learning issues, and set their own learning goals (Azer S.A. 2001). PBL curricula were found to require many more full-time and part-time clinically-qualified teachers to execute (Heylings DJ 2002).

A study in India indicated that anatomy was not covered adequately and uniformly through PBL sessions (Nayak S et al 2000). The study found that embryology, osteology and histology were not adequately covered. Some students found PBL stressful as well. The authors concluded that PBL curriculum has several advantages over conventional curriculum but that a lot of important issues in anatomy could not be taught through clinical problems alone. Such areas have to be taught by lectures. They recommend a hybrid approach to the teaching of anatomy.

Nandi PL et al (200) through a Medline search (1980-1999) compared the newer PBL curriculum and the conventional lecture-based mode of teaching. Areas of comparison included the academic process; programme evaluation, academic achievement; graduates performance; specialty choices and practice characteristic as well as the attitude of students and teachers toward the programme. They found that students of the PBL curriculum found learning to be "more stimulating and more humane" and "engaging, difficult and useful". The student

showed better interpersonal skills and psychosocial knowledge as well as better attitude towards patients. Students trained under conventional model, however, performed better in basic science examinations. The authors conclude that the two curricula encourage different ways of learning, but that there is no convincing evidence of improved learning with PBL curriculum.

Another study by K. Hindija, et al (2005) compared second year medical students taught on a traditional course and on an integrated course. Those taught on a traditional course exhibited a significantly higher level of knowledge than the other group.

The System-Based Learning (SBL) appears functional for many students who feel greatly motivated. However, the link between the systems is usually left to the students to decipher.

The Brighton and Sussex Medical School (BNMS) in the United Kingdom, one of the newer medical schools, uses an integrated Systems-Based approach to cultivate academic knowledge and clinical experience (Evans DJ, Watt DJ 2005).

They combine a multi-disciplinary approach with traditional and contemporary methods. Unlike most of the newer medical schools, BSMS uses cadaveric dissection as the cornerstone of its teaching. Imaging techniques are used to demonstrate living anatomy. Unique to BSMS curriculum is the teaching of anatomy in later years of the programme during specialist rotations eg ear, nose and throat surgery, when students return to the dissecting room to study anatomy relevant to the specially.

The Place of Cadaveric Dissection/prosection

Many medical schools are now de-emphasizing dissection of cadavers in the teaching of anatomy.

In a study among medical students in Australia, the students agreed that dissection deepened their understanding of anatomical structures and helped them recall what they had learned (Azer SA, Eizenberg N 2007). Interestingly, innovations such as interactive multimedia resources did not replace the students' perceptions about the importance of dissection.

In another study of twenty eight anatomy departments in the United Kingdom by Fitzgerald JG et al (2008), they found that cadaveric dissection was retained by 76% of the departments.

Older J. (2004) commenting on the reduction in undergraduate teaching and knowledge of anatomy in some medical schools lamented that the "impression in the United Kingdom now is that the system is allowing young men and women with poor knowledge of anatomy become surgeons". He concluded that "the dissected cadaver remains the most powerful means of presenting and learning anatomy as a dynamic basis for solving problems".

Recommendation and Conclusion

The current trends in investigative and diagnostic medicine call for a review of the way we teach anatomy. The quantum leap in the field of imaging techniques in medicine in recent times calls for a greater emphasis on radiological anatomy than at present.

Embracing PBL wholesale in our environment now may not be feasible because of obvious challenges of staffing and facilities. This is made even more difficult where preclinical departments are located outside the teaching hospitals.

The same challenges exist for System-Based Learning. However efforts must be made to develop a hybrid learning approach where aspects of PBL and SBL are integrated into current conventional Subject-Based System. These would require huge investments on staffing and facilities.

Cadaver dissection must be maintained because of the obvious advantages to the students. This should be heavily supplemented by well prosected cadavers for quick revision; variety of anatomic models; interactive multimedia; surface and clinical anatomy; imaging and procedural anatomy.

Anatomy departments should strive to add specialists to the traditional anatomy teachers-specialists in imaging techniques, radiologists, endoscopists, physiotherapists and clinicians as full-time or part-time staff.

In so doing, anatomy would become a living subject relevant as a centre-stage subject in medical education.

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