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RESEARCH ARTICLE

TEACHING HUMAN ANATOMY IN THE MEDICAL CURRICULUM: A TREND REVIEW.

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Abstract

Teaching human anatomy has been reduced in the medical curricula globally, resulting in a decreased knowledge of human anatomy in practicing doctors. The decreased teaching of anatomy to medical student has been reported in many journals. It has been found that cadaveric dissection to be most suitable method in learning anatomy, which has been reduced due to various factors. Dissection should remain as the principle teaching modality for anatomy teaching in modern medical schools. There are reports suggesting that, in some centers, studying anatomy using cadaver-dissection is no longer demanding and this trend is inclined to underestimate the crucial purpose of anatomy in the medical field. Modern teaching methodology and the problem based learning (PBL) does have a good outcome in understanding the clinical part of a disease. The depth of basic medical sciences knowledge has been found to be inadequate among the students. It is still debatable, to what extent the basic medical sciences knowledge, especially anatomy is needed for becoming a good doctor. This has necessitated a serious evaluation of the method of human anatomy teaching in medical schools around the world.

Introduction:-

Teaching of all basic medical sciences and particularly human anatomy has reduced in the medical curricula globally during past two to three decades, even though the level of anatomy knowledge required by young doctors has been increased in the past two decades[1,2,3,4]. This decline in human anatomy teaching and learning resulted in faulty and defective and performance in clinical practice, patient care, and medical education[3]. The decreased teaching of anatomy to medical student has been reported in many articles[1, 2,3,5,6]. There is no single teaching method in anatomy to meet all aspects of the curriculum. It has beenfound that anatomists viewed that, cadaver dissection to be the most appropriate method to achieve the anatomical learning objectives and outcomes[3]. Cadaver dissection should remain as the prime teaching modality in anatomy courses. However, due to decreased availability of cadavers for dissection, especially in gulf countries which do not have body donating programs, the teaching and learning anatomy has become a tough task[1]. The problem based learning (PBL) does have a promising outcome in understanding the clinical aspects of a disease[3]. But still, on the other hand the cognitive expectation of basic medical sciences knowledge has been found to be insufficient among the students[1, 3]. It is still open to discussion, to what extent the basic medical sciences subjects, especially anatomy is needed for becoming a successful doctor[1, 3, 4]. This has necessitated a thoughtful evaluation of the method of human anatomy teaching in medical schools. In this article, I have reviewed this trend of teaching human anatomy in medical curriculum globally.

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Factors Determining:-

The decline in teaching anatomy is due to tremendous decrease in teaching time, shortage of competent anatomical facultiesand reduced allocation of educational resources[1]. Introduction of (PBL) curriculum resulted in the reduction of didactic lectures and cadaver dissection in anatomy practical sessions[7]. Students are exposed for an early clinical set-up, to understand the detailed aspect of human behavior and motivated them to develop good interest in first year subjects[8]. Increased importance on early clinical exposure leads to less availability of time in basic science subjects and less availability of time in medical school for the basic science subjects in the medical schools[9]. Another factor for this decline is switching on to the "organ system based curriculum" with limited number of lectures and teaching hours allocated to the basic science and anatomy teaching[10].

The modern teaching methods using plastinated specimens, plastic bones, computer images and usage of anatomage reduces the exposure to dissection / anatomy prosected specimens as each institution develops their own curriculum and teaching modules[1, 10]. Thus anatomy content differs at medical institutions and there is no consensus with regard to the extent of anatomy knowledge required for an undergraduate doctor[10]. The dissection and prosections are not to be underestimated in a medical curriculum, as it provides a 3-dimensional effect of the subject which cannot that be attained by the modern advanced multimedia anatomy programs[11]. Global curriculum reforms, have culminated in a sharp decline in teaching hours of gross and microscopic anatomy. This trend headed to a considerable analysis of the methods of anatomy teaching. Furthermore, the elimination of anatomy demonstrator / tutor positions in many medical schools has deprived exposure of surgical trainees to clinical anatomy teaching[11].

Cadaver dissection and teaching anatomy requires very close observation of students. There is a scarcity of competent anatomists to manage the situation[1]. There are some ethical and emotional worries for using human specimens, physical and psychological side effects in using cadaver dissection[11, 12]. During 1995 and 2000, there was a seven times increase in claims based with regard to the anatomical misconception[3]. There is a lot of pressure from the society for the clinicians to have good basic knowledge of human anatomy. A disparity between expectations and reality may aggravate future legal claims[3].

Reduced allotment of funds and resources is one of the reason for the decline of anatomy teaching in medical curriculum[1]. Some British and Portuguese medical institutions have stopped cadaver dissection in exchange for virtual dissection of cadavers in cyberspace due to expense and ethical concerns[1]. With regard to the fund allocation by the medical schools, teaching anatomy and education in general has the least priority compared to the patient service and research[1]. Cadaver preservation has become expensive and also some available bodies are does not suit for dissection due to disease, aging, or obesity. Setting histology laboratory and maintaining light microscopes is at high cost which is a factor responsible for the reduction of anatomy teaching in medical schools[11]. Moreover, low salaries paid to those with clinical qualifications and gross anatomists are not appointed for teaching anatomy[1]. Incorporation of advanced teaching technology into curricula, totally replaced the cadaver-based teaching, such as computer-assisted teaching and using multimedia programs which gives quick 3-Dimensional images[12]. New methods such as computer assisted learning (CAL), mind-mapping and linking concepts, power point presentations, educational video, and plastination technology have shown an improvement in student performance[1, 11].

Nature of the Trend:-

Human anatomy teaching in medical curriculum especially for undergraduates has been declined since last two decades. It is reported that, it has dropped below a level that is required for the undergraduate medical students. One of the reasons reported for this was the frequent curricular changes[3, 13]. In Australia and Asian medical schools about 80% of Anatomy teaching has reduced since the introduction of problem-based learning, in which more than 90% anatomy teaching occurs in the early years of medical course[13, 14]. Australian Medical Schools reduced the duration of teaching from 500 hours per year to 52.5 hours[11]. Medical Schools in New Zealand, United Kingdom, and Ireland has also reduced anatomy teaching and even removed the dissection sessions from the medical curriculum. The United States, too has sharply cut the amount of time students spend dissecting[15]. Most of them argue that, it is inappropriate to teach unneeded details in basic sciences, in gross anatomy, histology and embryology, which are often irrelevant to clinical practice[5]. Human cadaver reveals uniqueness of each body, which cannot be learnt from text books, computers and other modern educational tools[5]. From the student's point of view, the perception was that, the dissection intensify their understanding of anatomical structures, easy to recall and it provided them with a three dimensional perspective of the structures[14].

There are evidences that, in some Universities, learning human anatomy by cadaver dissection is no longer a prime concern and this trend has undervalued the key aspect of anatomy in medical practice[1]. There is a declined teaching and knowledge of anatomy in the Gulf Cooperation Council (GCC) medical schools[1]. The method of Peer Assisted Learning (PAL) and Reciprocal Peer Teaching (RPT) in anatomy are useful to both students and faculty[2, 13, 16]. Since there is no common national core curriculum, there have been many new curricula is introduced, without any external audit or validation and medical schools have been free to teach and because of this, anatomy teaching, content of the curriculum, teaching method and assessment are exclusively at the choice of the concerned institutions[4,17]. It is not very clearly known that, whether this decline in anatomy teaching has been excessive[3]. However there are evidences indicated that the anatomy knowledge of the professional doctor is par below an agreeable and pleasing level[3]. This trend leads to a thoughtful review of the standard of anatomy teaching in medical schools[11]. The removal of anatomy tutor / demonstrator positions in many medical schools has deprived the exposure of surgical trainees to clinical anatomy teaching[11].

Anatomy should be taught in the same manner from year one up to graduation in the organ system based curricula[4]. Examine the curriculum, the content, quality, method of teaching, and the infrastructure within which it is delivered[14]. Any national anatomy curriculum, should include useful applied anatomy and it should be written or at least edited by senior clinical anatomists and senior clinicians[4]. Introduce applied anatomical courses to integrate the hypothesis that are vital for surgical practice like ‘‘Anatomical Principles in Surgical Practice’’ at the Arabian Gulf University in the Kingdom of Bahrain during 2001 for the fifth and sixth year medical undergraduates in their clerkship rotation[18].

Advantages and Disadvantages:-

On one hand this trend heightens and synthesize student’s knowledge of relevant field in horizontal and vertical integration of separate disciplines[1]. The much congested anatomy program can be reduced by just teaching clinical anatomy, i.e., anatomy that is used in relation to patient management, whether it be gross or radiological[4]. It is not necessary to significantly increase hours spent on anatomy; it just requires a revision of the required topics[4]. This decline is an appropriate response to unnecessary rote learning of clinicalinformation[13]. More autonomy in choosing various combinations of anatomical images that is not possible in traditional cadaver-dissection based learning. Studies have shown that long time exposure to formaldehyde vapours causes adverse effects like corrosion of eyes, dermatitis, congenital defects, and nasal cancer[12].

The major deficiency in anatomical knowledge in senior residents, registrars and surgeons is potentially dangerous in surgery and in patients[4]. These factors lead to strain in student and faculty, thus resulting in discontinuity and lacuna in anatomy knowledge which results inadequate skills for safe medical practice[19]. This trend creates a denial effect on the anatomy knowledge of new medical graduates, which results in the increase of the claims associated with anatomical errors. Misdiagnosis and eventual malpractices are reported because, students cannot learn the principles of developmental anomalies and anatomical variations without exposing to different cadavers[1, 3, 19]. There is no sense of touch (perception of structures) in understanding of anatomical structures without cadavers.

Student’s knowledge may go below the least required standard for reliable medical practice which is hazardous to the society and deaths are attributed to anatomical incompetence. This is a strong threat to the student-cadaver-patient relationship in medical education and is a concern for the level of knowledge achieved by student for basic sciences and anatomy in particular[6, 11, 18, 19].

Throughout undergraduate training in medical course there should be a vertical integration of human anatomy. Cadaver-dissection should be reinstated into medical course. The problem based learning, computer assisted learning and modern digitalized methods of teaching anatomy are to be retained. Draw guidelines for anatomy curriculum and also compose syllabi specifying the level of anatomical knowledge that is expected from the medical students in the examination. All universities must accept that their clinical schools should work hand-in-hand with their anatomy departments in their teaching[4]. Every medical school should define a common minimum core anatomy curriculum at undergraduate level at the commencement of the course. Give more emphasis on surface, radiological and general anatomy for teaching organ systems based curricula. The clinical anatomy teaching should be more in the later part of the course[1].

Conclusion:-

The content of anatomy should not reduce significantly in medical courses. If reduce it, should maintain teaching anatomy to their specific needs. As far as possible teaching anatomy should be clinically oriented with closer links between basic science and clinical facts. To achieve the overall goals of medical education in attainment of knowledge, skills, attitudes and values which are crucial to accomplish medical endeavor competently and safely. It is necessary to teach adequate anatomy and to integrate basic sciences courses in clinical experiences order to achieve these goals. Patients should not be taken at risk without adequate knowledge of clinical anatomy.

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