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Teaching Radiological Anatomy to the First Year MBBS Students By Using Questionnaire and Analyzing Their Perception

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Abstract

Background: The Radiological Anatomy is a clinically oriented subdivision of Human Anatomy, but as observed, it is largely neglected by the undergraduate first year MBBS students. This study is undertaken to find a suitable method to teach as well as generate interest in learning this subdivision of Anatomy.

Aim and Objective: To facilitate the first year MBBS students to study Radiological Anatomy and improve the understanding of the subject and thereby enhance their performance. To analyze their performance and study their perception.

Materials & Methods: This is a prospective study, seeking preference for method of teaching Radiological Anatomy among first year MBBS students. Data collection was done with a structured questionnaire containing questions pertaining to their preference, perception as well as their attitude for learning Radiological Anatomy after taking an informed consent.

Results: In this study, majority of the students preferred the teaching method of using questionnaire booklet of Radiological Anatomy then the conventional way.

Conclusion: Questionnaires should be incorporated in those subdivisions of Anatomy which are neglected by the students for understanding of the subject, improve thinking ability and thereby performance.

Keywords: Radiological Anatomy; Questionnaire; Performance; Perception; Attitude.

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INTRODUCTION

In the undergraduate first year MBBS medical course as per NMC guidelines the time allotted for study of basic sciences is approximately only one year. They study three disciplines Anatomy, Physiology and Biochemistry in first year. The subject Human Anatomy is a very vast subject and has many subdivisions as Gross Anatomy, Neuroanatomy, Microanatomy, Embryology, Genetics, General Anatomy and Living Anatomy. Their curriculum also includes Radiological

Anatomy. Lot of their time, attention is taken by the subject Anatomy. They give emphasis on studying the gross, micro, embryo, neuro, and general anatomy subdivisions which are undoughtedly major subdivisions of anatomy. These subdivisions have lot of weightage in theory as well as practical in terms of marks.

It is observed that studying Radiological Anatomy is given secondary preference or preferred to be kept as option by the students. It has marks weightage mainly in the practicals. Radiological Anatomy is a informative, clinically oriented and so a interesting part of Anatomy. This study is done to facilitate students to study Radiological Anatomy and enhance their performance in the radiology examination. Also studying Radiological Anatomy helps understanding the Gross Anatomy.

MATERIALS & METHODS

This is a prospective, mixed (qualitative and quantitative) study seeking preference for method of teaching Radiological Anatomy, among undergraduate first year MBBS students. The study was initiated after taking requisite clearance from Institutional Ethics Committee. The students were explained about the purpose of the study, its usefulness for academic improvement and informed consent was taken from each student.

A questionnaire booklet of Radiological Anatomy was prepared.[1] The radiographs which are included in the first year MBBS syllabus were photographed. These photographs were then titled and labelled to incorporate them in the radiology questionnaire booklet.

The title of the photograph included following things:

1. Weather the radiograph is a plain or contrast study?
2. View of the radiograph – antero-posterior, postero-anterior, lateral or oblique.
3. The radiograph is taken to study which part of the body, or to study joint, vessels or organs etc.

The bony features and the soft tissues seen in the radiograph - vessels, organs, tubes e.g. gastro-intestinal tract and muscles were labelled.

Below the photograph a description of the radiograph was given with a list of structures seen in it. This was followed by questions on the radiograph. The questions were on the Radiological Anatomy of the radiograph as well as on related relevant Gross Anatomy. Below each question a space was given to write answer to the given question. This radiology questionnaire booklet was then given to the students.

The radiographs were taught to the students in DOAP classes. In these classes the questions from the questionnaire and their answers were discussed. The students were asked to study the radiology questionnaire booklet and pen down answers of the questions given to them. The answers written by them were then analyzed by the teachers.

After the students appeared for the Evaluation–Assessment Examination they were given a questionnaire. Data collection was done with structured questionnaire containing questions pertaining to their preference of use of radiology questionnaire booklet for learning, perception as well as attitude for learning Radiological Anatomy. Feedback from the students on nine parameters was collected and analysed. The parameters were based on their preference and perception for the radiological anatomy booklet given to them.

RESULTS

Following parameters were studied: Weather the radiology questionnaire booklet helped them to understand radiographs and in turn understand Gross Anatomy and improve thinking ability for studying the subject. Did the radiology questionnaire help to build confidence by improving presentation skills and answering ability during evaluation? Did the questionnaire make learning Radiological Anatomy more interesting? Does a questionnaire booklet be made of all the topics in Anatomy to assist teaching and learning Anatomy or weather the conventional method of teaching without a questionnaire was better?

A total of 158 undergraduate first year MBBS students participated in this study. Feedback from students on preference of teaching method and learning for Radiological Anatomy was analysed through the questionnaire results are shown in numbers and percentages in Table 1.

Table 1: Preferences of the students regarding teaching Radiological Anatomy and Radiology Questionnaire Booklet Abbreviations in the Table: SA – Strongly agreed, A – Agree, UC – Uncertain, DA – Disagree, SDA – Strongly disagreed

Sr. no.	Did the Questionnaire help to	Options				
		SA No. %	A No. %	UC No. %	DA No. %	SDA No. %
1	Understand the radiographs	84 53.16%	67 –42.40%	6 –3.79%	–	1 –0.63%
2	Understand the Gross Anatomy	36 –22.78%	98 –62.02%	20 –12.65%	2 –1.26%	2 –1.26%
3	Make learning radiological anatomy more interesting	60 –37.97%	81 –51.26%	14 –8.86%	1 –0.63%	2 –1.26%
4	Improved the thinking ability	58 –36.70%	82 –51.89%	16 –10.12%	1 –0.63%	1 –0.63%
5	Improved the answering ability	77 –48.73%	66 –41.77%	13 –8.22%	1 –0.63%	1 –0.63%
6	Develop presentation (answering) skills during evaluation	69 –43.67%	75 –47.46%	11 –6.96%	1 –0.63%	2 –1.26%
7	Build confidence during evaluation	69 –43.67%	74 –46.83%	13 –8.22%	–	2 –1.26%
8	Does a questionnaire booklet be made of all the topics in Anatomy to assist teaching and learning Anatomy?		Yes– 146 –92.40%		No–12 –7.59%	
9	Weather the conventional method of teaching without a questionnaire was better?		Yes– 17 –10.75%		No– 141 -89.24%	

DISCUSSION

Radiology as a method of diagnosis is essentially Applied Anatomy. The medical student learns Anatomy by various modalities doing dissections, studying hard parts, soft parts, micro anatomy and radiographs in DOAP sessions and in lectures. Dissection helps to train the hand and eye, but it does not of itself show how the body works. To think of structure in terms of function the student must compare the structures revealed in the dead body with such data as he may obtain of the form and the action of these structures in the living body. The radiographs help the student to think of the structures found in the cadaver as in place in the living body.[2]

The progress made by Radiology in the examination of the human body has led to its increasing use in the diagnosis of disease, so that every general practitioner must have some knowledge of the normal radiographic appearances of the body if he is to understand the meaning of the radiologist's report. It is plain that any attempt to teach students the meaning of radiographs showing abnormal conditions without first teaching them to interpret radiographs of the normal is like trying to teach morbid histology without having first a knowledge of normal histology. The teaching of normal radiology in the anatomy department, as well as making the subsequent teaching of radiographs of pathological conditions easier, also exerts a favorable influence on the student's approach to his anatomical studies.[4]

A study was done by C Chew, et al[3] to directly link Radiology teaching with improved Anatomy examination result. They have concluded in their study that radiology small group teaching significantly improved anatomy scores of medical students in the summative end of year examination, compared to the years when it was not taught.

Utilising postgraduate trainees to deliver undergraduate teaching is a logical and well established practice encouraging multimodality

input and promoting symbiotic learning.[6] In this study an Applied Anatomy class was introduced at the completion of each anatomical module for the academic year of 2011/2012 (first and second year students). The format contained two hour class, involved dividing the students into 7 to 8 groups and rotating them around a matching number of stations at 8 minute intervals. The stations were taught by first year Radiology Registrars each addressing different imaging modalities with anatomical regions. The author concluded that the study was beneficial for both the teachers and the students.

The review article by N B Heptonstall et al[7] presents the importance of integrating Radiology and Anatomy teaching. They stated that on an average only 5% of total teaching time in medical education is dedicated to radiology. Often, radiology teaching does not adequately fulfill students learning needs and potentially leaves them underprepared for medical practice. Benefits of integrating radiology and anatomy include improved clinical application of anatomy, an increase in student's interest in anatomy, and ultimately improved radiological interpretation. They have concluded that combining radiological resources with traditional anatomy teaching methodology in a blended approach is most beneficial.

Anatomy and Radiology are usually taught separately with a considerable time lag. A study was done by S Dettmer et al[8] on interdisciplinary course. The integrative course "Radiological Anatomy" was established in the second year of medical education, combining these two closely related subjects. This interdisciplinary course was retrospectively evaluated by consideration of a student questionnaire and staff observations. They concluded in their study that integrative teaching of anatomy and radiology was well received by the students and both anatomical and radiological comprehension and motivation to learn were improved.

Kishore D. Khushale et al[5] in their study prepared charts of histology diagrams to assist the first year MBBS students to draw diagrams in their Histology Journals. They wanted to augment the students ability for drawing good histology diagrams, to enhance the performance of the students in evaluation of Histology. They concluded that histology charts must be developed by each department of anatomy for enhancing the drawing skills of the students, improving understanding of the subject, thinking ability and reducing mistakes committed the students.

Similar to the studies mentioned above[3-8] in this present study an attempt is made to enhance the understanding of Radiological Anatomy of the first year MBBS students and thereby their performance in examinations. By analysing the response of the students for the questionnaire booklet of radiology it is evident that majority of the students are in favour of the questionnaire booklet.

The radiology questionnaire booklet assisted to understand the radiographs was strongly agreed by 53.16% and agreed by 42.40%. Similarly booklet helped to understand the Gross Anatomy was agreed by 62.02% and strongly agreed by 22.78%. Learning Radiological Anatomy by using the booklet was more interesting was agreed by 51.26% and strongly agreed by 37.97%, also 51.89% agreed and 36.70% strongly agreed that their thinking ability improved. Significant percentage of students have approved that the booklet has improved their answering ability (48.73% strongly agree, 41.77% agree), help develop presentation skills (47.46% agree, 43.67% strongly agree) and build confidence during evaluation (46.83% agree, 43.67% strongly agree). Majority of the students 92.40% are in favor of a questionnaire booklet made for all the topics in Anatomy to assist teaching and learning Anatomy. 89.24% are not in favor of the conventional method of teaching without a questionnaire booklet. Refer Table 1.

CONCLUSION

Questionnaire booklet of Radiology was well received by the students. Both, radiological and anatomical comprehension and the motivation to learn were improved. The teaching of normal Radiology in the Anatomy Department, exerts a favorable influence on the student's approach to his anatomical studies. It appears that combining radiological resources in terms of booklet with traditional anatomy teaching methodology in a blended approach is most beneficial. Questionnaires should be incorporated in those subdivisions of anatomy which are neglected by the students.

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