

Impact of Use of Audio-Visual Aid on Dissection Hall Teaching

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Abstract: Dissection hall teaching, which is a backbone of teaching and learning Anatomy, is suffering a lot due to dearth of faculty members as MCI has reduced the number of teachers required per hundred students. In lack of proper guidance and clear instructions students are gradually losing interest in dissection, therefore we thought of using audio-visual aid as an adjunct for Dissection hall teaching. 250 MBBS students of 2015 batch were taught lower limb in dissection hall in traditional way. While teaching neuroanatomy, 5 classes were taken by A-V aid in which features of brain were shown to the whole batch. After completion of each part, an OSPE was conducted of 50 marks. To observe the impact of this teaching on the performance of students, marks of both the tests were compared. A feedback questionnaire was also filled by students after completion of neuroanatomy. The average score obtained by students in lower limb was 21.30 ± 7.07 whereas in neuroanatomy it was 26.35 ± 8.41 and the gain in the marks was statistically significant. The percentage of students who secured less than 50% marks decreased from 66.95% to 43.64%. Feedback analysis showed that 94.53% students found the pre-dissection demonstration very useful. 92.08% students agreed that it helped them in understanding inter-relations of structures. Thus the teaching intervention by using A-V aid as an adjunct was very effective in giving uniform instruction to the UG as well as PG student and in enhancing the understanding of subject.

Keywords: anatomy, dissection, teaching methods, audiovisual aid

I. Introduction

Anatomy is the foundation of medical curriculum. Proper understanding of topography of human anatomy is indispensable to all branches of medicine. Gross anatomy is actually learnt in dissection hall (DH) either by doing dissection or studying prosected specimens. It allows students to perceive three dimensional interrelationships of structures and also gives them opportunity to confirm their learning, rely on their observations and appreciate the significance of concept of variability [1]. It is a favorable approach for achieving important learning objectives in the field of Anatomy [2]. Even students feel that dissection is vital for anatomy learning [3]. Revolutionary advancement in the field of technology has led to significant modifications in the teaching methodology. Increasing availability and waning cost of newer technology has enabled many institutions to supplement anatomy teaching with interactive multimedia resources, virtual 3D images and live body scans but in the eyes of students learning by dissection provides unparalleled means of teaching gross anatomy [4].

Though it is an established fact that dissection is core strength of Anatomy but lately teaching in dissection lab is suffering due to several factors like time constraint, scarcity of cadavers, dearth of faculty members and increase in the number of students. The misbalance in teacher student ratio causes lack in proper guidance and clear instructions to students, due to which they lose interest in the subject. If we analyze these challenges we will realize that we as a teacher neither can increase the number of months devoted for anatomy teaching nor can we increase the number of faculty members in any institutions as MCI has reduced the faculty requirement per hundred students. We don't have any say against increase in annual uptake of number of students. But still, if we wish to improve the teaching in dissection lab we can work upon scarcity of cadavers by instating 'Body Donation Campaign' and efforts can be made to combat lack of proper guidance in DH. The present study is an endeavor in this direction in which audio-visual aid has been used to instruct the MBBS students and PG students before going to dissection lab, hypothesizing that it will help in self directed learning and will create interest in students hence will improve their performance. Aim of the present study was to assess impact of use of audio-visual (AV) aid for instruction in dissection hall teaching by taking feedback from the students and by evaluating their performance.

II. Material and Methods

The study was conducted on 250 MBBS students of 2015 batch of King George's Medical University, Lucknow. The students in the department are divided into eight batches, of almost 31 students in each batch. Every batch has two resident in-charge, usually junior resident-1 and 2, and one teacher in-charge for guiding

students in DH. Ethical clearance was obtained from Institutional ethical review board. An informed consent was taken from students before participating in the study.

Lower limb (LL) was taught to students in traditional way in dissection hall. There is an audio-visual OT unit and class room live setup in the department. With its help procedure performed in cadaveric lab can be projected to lecture hall. There is one teacher in cadaveric lab that performs procedure and another in lecture hall who ensures that proper projection of part of interest is there and also interacts with students. Two way communications between two teachers is possible so that if students demand to repeat or emphasize anything, the teacher in lecture hall can communicate this to teacher in cadaveric lab. While teaching Neuroanatomy (NA), 5 classes were taken by using AV aid. Features of brain were shown to the students. The students have liberty to ask anything or repeat anything that they were unable to understand. After this instruction class students went back to DH where they saw the features of brain by themselves and were helped by their batch teachers.

An OSPE of 50 marks was conducted after completion of Lower limb as well as Neuroanatomy. Only those students who appeared in both the tests were considered in the study. Marks of these students were tabulated, mean and standard deviation was calculated. Marks of both groups were compared using Student's t-test. All the calculations were done on Microsoft Excel, 2007. A level of significance of $p < 0.05$ was used. Feedback from students, after completion of neuroanatomy classes, was also taken, which consisted of 12 questions. Likert scale with responses ranging from strongly disagree to strongly agree with a score of 1-5 was used in the questionnaire. The results were tabulated and expressed in percentage.

III. Results

Out of 250 students, marks of 236 students were taken into consideration because these students appeared in OSPE of lower limb and neuroanatomy both. Out of remaining 14 students 9 appeared in only one test and 5 didn't appear in any. Introduction of AV aid for dissection hall teaching was successful as mean value of marks obtained after intervention was significantly higher ($p < 0.001$) (Fig.1, Table 1)

Table 1: Comparison of mean marks obtained by students in Lower limb and Neuroanatomy

	Lower Limb (n=236)		Neuroanatomy (n=236)		p value
	Mean	Standard deviation	Mean	Standard deviation	
Marks	21.30	7.07	26.35	8.41	<0.001

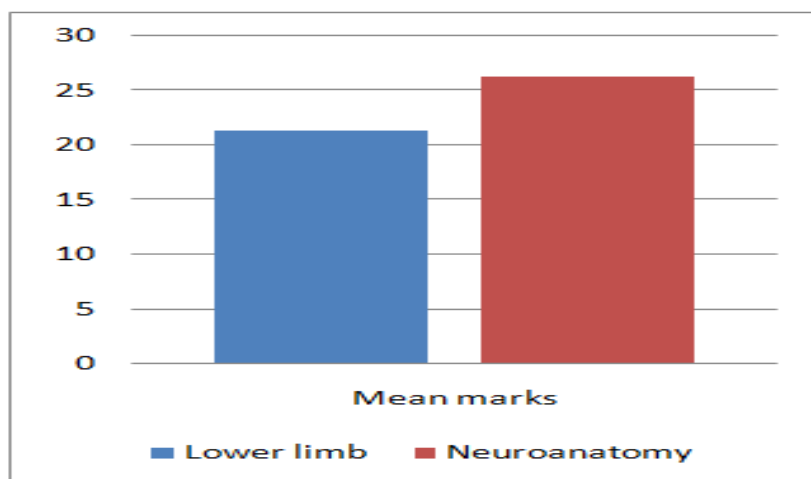


Figure 1: Comparison of mean marks obtained by students in Lower limb and Neuroanatomy

For further analysis of student's performance, the marks obtained were categorized in 4 groups: less than 35% (as 35% is the passing criteria for internal assessment), 35% to less than 50% (as 50% is the passing mark in professional exam), 50% to less than 70% (good performance), 70% and above (very good performance). Only 13.98% students obtained less than 35% marks when AV aid was used for DH teaching as compared to 28.81% students when the part was taught traditionally. This noteworthy fall was statistically very highly significant. There was drastic decrease ($p < 0.001$) in the number of students who obtained less than 50% marks after intervention in teaching methodology (LL-66.95%, NA- 43.64%). There was no significant difference in the percentage of those students who obtained 50% to less than 70% marks. In LL, only 2.12% students obtained more than 70% marks where as in NA 19.07% students, revealing remarkable achievement ($p < 0.001$) (Fig 2, Table 2).

Table 2: Performance based comparison of percentage of students

Marks obtained	Lower Limb (n=236)		Neuroanatomy (n=236)		p value
	Number	Percentage	Number	Percentage	
Less than 35%	68	28.81	33	13.98	<0.001
35% to less than 50%	90	38.14	70	29.66	0.05
50% to less than 70%	73	30.93	88	37.29	0.15
70% and above	5	2.12	45	19.07	<0.001

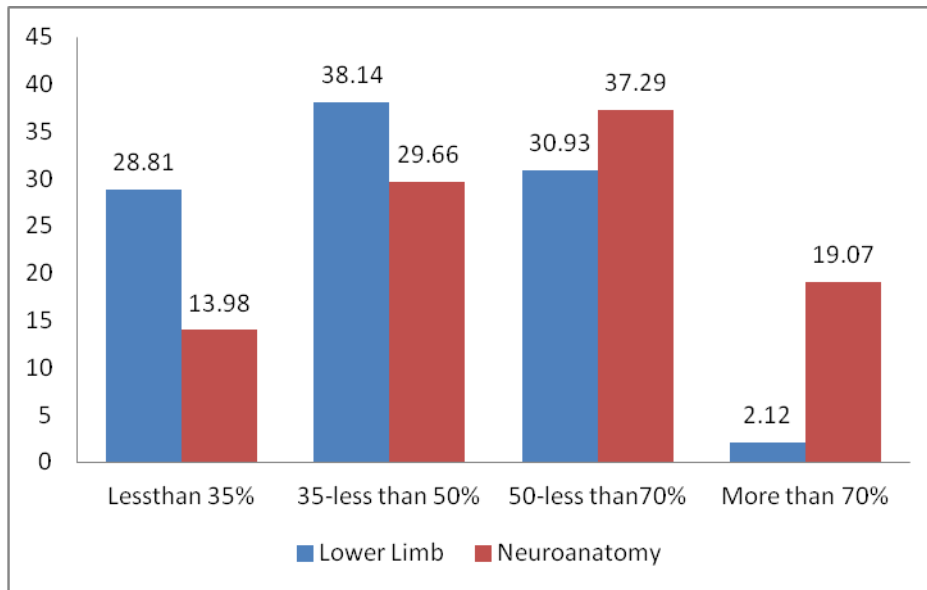


Figure2: Performance based comparison of percentage of students

Analysis of feedback questionnaire revealed that 94.53% students agreed that pre dissection demonstration of parts was very useful. 92.08% believed that as it helped in understanding relations of various structures in part shown so such demonstrations should be taken before every dissection class (88.56%). After demonstration when students got the opportunity to revise the parts themselves they knew the things they have to focus on (88.58%) and were confident in identifying structures (88.06%). 13.93% students believed that these type of instructions are mere wastage of time allotted to DH. 25.87% students find difficulty in understanding the orientation of projected part while seeing it on screen and 37.20% students were not confident in identifying those structures while revising themselves that they have seen in zoom in presentation. Maximum students found that the sound and image quality was good (63.11%) (Table 3).

Table 3: Feedback of students on use of AV aid for pre dissection demonstration

Question	% of students responding to different Likert scaling					
	1	2	3	4	5	NA
Demonstration of parts using AV aid was very useful	0	0	3.48	28.86	65.67	1.99
It helps in understanding relations of various structures in part shown	0.5	0	6.97	36.86	55.22	0.5
These demonstration should be taken before every DH class	1.99	3.98	4.48	24.38	64.18	0.995
They should be taken after completing each region	0.995	2.49	7.96	24.88	61.69	1.99
Can identify structures and understand relations with confidence when revise same part by ourselves	0.5	0	9.45	35.82	52.24	1.99
When revise part by ourselves, know clearly what to look for	0	2.49	7.46	40.3	43.28	6.47
Sound and image quality of AV aid is good	2.99	12.94	18.4	46.27	16.92	2.49
Instructions are wastage of time allotted to DH	35.82	27.86	17.91	9.45	4.48	4.48
There is difficulty in orientation of projected part when looking on screen	17.41	27.86	25.37	17.41	8.46	3.48
Difficulty in identification of those structures while revising parts, which has been shown in zoom, as they do not look so clear by naked eyes	12.8	34.15	13.41	32.32	4.88	2.44
Poor handling of mic and camera	15.42	41.29	15.92	18.9	5.47	2.99
Instructor not well versed with technology so impact of demo lessens	23.88	34.83	19.9	9.95	3.98	7.46

NA- not answered

IV. Discussion

Dissection is vital for learning anatomy and creation of mature physicians because it teaches a multidimensional understanding of organization of human body, touch mediated perception of body, anatomical variability, basic language of medicine, practical skills, learning in peer group and functioning as part of a team. It also introduces physician-patient relationship, concepts of humanistic care and comprehension of death and dying [5]. Studies have shown that students are of view that dissection enhances logical thinking and is a best method for learning anatomy [6,7,8], but they often find it difficult to recollect theory classes while performing dissection so they want some kind of assistance in dissection hall either in form of video or chalk & board [9]. Many technological advances came into being to increase the efficiency of dissection in dissection hall. In some medical schools, dissection CDs are used as an adjunct to dissection, enabling them to see before they do. Computers and modern technology has been integrated to improve dissection efficiency, which resulted in significant enhancement in independence and proficiency of students, efficiency of their dissection time, and the quality of laboratory instruction by the faculty [10]. However in a questionnaire based study students preferred demonstrators aided dissection (67.6%) to computer assisted (25.2%), and even they suggested to increase the number of demonstrators who can spearhead dissection and provide motivation, drive and strictness, where required, to help students to overcome their inhibition [11].

We cannot deny the fact that there is great variability in sincerity, communication skill, commitment and knowledge of demonstrators which leads to non uniformity in instruction in dissection hall teaching. Residents looking after the batches are junior residents, who themselves are in learning phase. They don't have enough experience to decide between what to tell and what not to tell to the MBBS students who have very limited time. Further, the residents are not very confident also in recognizing the structures which the students realize and they lose trust in them. Therefore to give uniform instructions to students as well as residents this intervention was done. After instructions, students had opportunity to go back to DH and study the parts with the help of resident teachers. What they have been shown, now can confirm it by themselves. They knew before hand what they have to see. Residents also were more confident because they got uniform instructions. Feedback of the students also reflected that students found the pre-dissection demonstration very useful (94.53%). They agreed that it helped them in understanding inter-relations of structures (92.08%). As the students were clear that what they have to look in prosected part while revisions, so they were able to make best use of dissection time, were self dependent, confident and motivated. We had an apprehension that students might find it difficult to orient the structures while looking on screen, therefore conscious effort was made to give proper orientation of the prosected part, even then, 25.87% students found difficulty in orientation. We also had reservation that students might have difficulty in identifying those structures with naked eyes, that have been shown to them in zoom, to give better clarity and 37.20% students did find difficulty.

For the first time such an effort was made so we were not sure about the student's perception about technology. 63.19% students found that sound and image quality of AV aid was good. Only 14.37% students opined that there was poor handling of mic and camera and 13.93% were of view that as instructor was not well versed with the technology so impact of demonstration classes lessened.

With all its pros and cons, 88.56% students opined that such class should be before every DH class (in present study only 5 pre-dissection demonstrations were taken). Results of part completion test also reflected that introduction of AV aid for pre-dissection demonstration was successful as mean value of marks obtained after intervention was significantly higher ($p < 0.001$). In depth analysis of marks revealed that after intervention there was statistically very significant fall in the percentage of students who obtained less than 35% marks, where as drastic increase in percentage of students who obtained more than 70% marks ($p < 0.001$). Total number of students that obtained less than 50% also decreased significantly after intervention.

Both feedback analysis and performance in part completion test suggested that use of audio-visual aid for pre- dissection demonstration was very useful endeavor which helped the students in better learning the subject and hence improved their performance in the test.

People can debate that such results can also be obtained by showing various dissection CDs available in the market, to the students before dissection. Yes, definitely, that will also have impact but we believe that the demonstration given by faculty is far better than any instructional video because firstly these videos are usually in English language and the accent of spoken language is difficult to comprehend. Secondly, the instructions are according to the parts available in the department, level of studies and students of the institution, in nut shell according to the need of the students. There was uniformity in instruction because single teacher was giving instructions to whole batch. Things could be repeated and emphasized according to the demand of students.

V. Conclusion

The teaching intervention by using A-V aid as an adjunct for dissection hall teaching was very effective in giving uniform instruction to the UG as well as PG students. It enhanced the understanding of subject hence performance in examination. As suggested by students also such classes should be held more frequently

throughout the year. Even with limited faculty, instructions in dissection hall can be made more effective and students can use their time in dissection hall efficiently by adopting this methodology.

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