ORIGINAL ARTICLE

PERCEPTIONS OF CADAVERIC DISSECTION IN ANATOMY TEACHING

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Background: Anatomy professors world over are lamenting about medical students' lack of interest in dissections and its diminishing utilisation in medical studies. The objective of our study was to find out the reasons why some of the Pakistani medical students were avoiding dissections. **Method**: We conducted this study in 5 medical colleges of Pakistan from Dec 2010–Oct 2011. Questionnaires were prepared and administered to more than 500 Pakistani medical students, at least 6 months after their first cadaver dissecting session. Mostly 1st and 2nd year medical students participated in this study. **Result**: Around 43% students have actually performed dissections in some form, whereas around 57% had never touched the cadaver. Further evaluation of these results revealed that out of 57% of students, 45% avoided dissection due to bad smell of formaldehyde, 37% due to moral/ethical grounds, 22% due to low motivation and respect of human body, 19.4% due to anxiety, 18.6% due to religious reason, 16% due to fear, asthma and emotional reaction, 9.4% due to toxic chemical, 8.6% due to laziness and 7% due to nightmares. **Conclusion:** In spite of availability of required number of cadavers in all 5 medical colleges and a clear realisation amongst the students that dissecting cadaver is an effective way of learning anatomy; majority of students were not very keen and had therefore not performed dissection even once.

Keywords: Anatomy, dissection, cadaver, questionnaire, medical student, formaldehyde

INTRODUCTION

The word anatomy is derived from the Greek term '*anatome*' that means cutting up. Dissection is globally considered an essential part of medical training. It is designed to give students a hand on view of the body while also accustoming them to the transformation/ processes that the body undergoes after death. With time, there was a growing acknowledgement of the fact that a good medical or surgical practice could only be based on adequate and very exact knowledge of human anatomy which was derived from learning and teaching human dissection.[1,2]

The dissection training has remained an important part of curricula for decades uniformly across the medical schools all over the world. Lately, however, this trend has been changing. With literal mushrooming of private medical colleges, supporting varied degree of medical facilities, debate regarding significance of cadavers in the teaching of gross anatomy has heated up.

Numbers of medical schools around the world have either removed the practical, hands-on aspect of dissection in the medical undergraduate curriculum or are seriously considering such a measure, on financial and/or human resource grounds.[3]

In the United Kingdom, the new system-based curriculum at many medical schools includes less than two hours of gross dissection per week, down from eight hours in the core traditional curriculum. Some schools have entirely removed cadaver dissection from the class room.[4] Dissection is also being reduced and in some cases even being removed from the medical curricula in Australia, New Zealand, the United Kingdom, Ireland, and the United States.[5]

We started this study with the hypothesis that in spite of the very important role of dissections in understanding human body, relatively little percentage of medical students in Pakistan are getting benefited from it and appreciating cadavers as their first patients.

The objective of this study was to find out the reasons for which dissections are being avoided by majority of the medical students.

MATERIAL AND METHODS

We conducted this study in 5 medical colleges of Pakistan between Dec 2010 and Oct 2011. Structured questionnaire was prepared for this purpose and administered to more than 500 Pakistani medical students. Mostly first and second year medical students, all of whom had completed at least six months after their first exposure to cadaver dissecting class, participated in the study. The mean age of the students was 20 years (range 18–22). The female were 280 (56%) and 220 (44%) were males. Students were asked to fill out a 5 point questionnaire. Questions inquired about students' motivation, attitude towards dissection, emotional /medical or religious concerns. Suggestions to improve anatomy teaching were also solicited.

RESULTS

The results of 500 valid filled questioners were compiled. It was found that on average, 43% students spent their course time with active dissection and 57%

avoided or skipped cadaver related activities. There were statistically significant differences among these two groups. Further evaluation of these results revealed that out of 57% of students, 45% avoided dissection due to bad smell of formaldehyde, 37% due to moral/ethical grounds, 22% due to low motivation and respect of human body, 19.4% due to anxiety, 18.6% due to religious reason, 16% due to fear, asthma and emotional reaction, 9.4% due to toxic chemical, 8.6% due to laziness and 7% due to nightmares. Individual variability in dissection activity was high (Table-1, 2).

Table-1: Frequency of performing dissection

Dissection Done	times dissection performed	No.	%	Total	%
Yes	<10 times	74	14.8	212	42.4
	>10 times	71	14.2		
	Didn't mention number	67	13.4		
No	NIL	288	57.6	288	57.6

Table-2: Reasons to which students attributed their cadaver dissection repulsion

Reason	Yes		No		Unanswered	
Fear	80	16%	276	55.2%	144	28.8%
Religious Beliefs	93	18.6%	290	58%	117	23.4%
Ethical/ Moral Beliefs	188	37.6%	175	35%	137	27.4%
Emotional Reaction	81	16.2%	297	59.4%	122	24.4%
Respect For Body	109	21.8%	262	52.4%	129	25.8%
Anxiety/Tremors Of Hands	97	19.4%	301	60.2%	102	20.4%
Smell Of Formaldehyde	225	45%	166	33.2%	109	21.8%
Health Reasons/ Asthma	81	16.2%	312	62.4%	107	21.4%
Toxic Chemical	47	9.4%	337	67.4%	116	23.2%
Low Motivation	109	21.8%	271	54.2%	120	24%
Night Mares	37	7.4%	342	68.4%	121	24.2%
Lousiness	43	8.6%	332	66.4%	125	25%

Table-3: Student's suggestions for improvement in their training

Suggestions	Number	Percentage
Provision of more Cadavers	303	60.6
Computer Aided learning (Cal)	160	32
Dissection aided by demonstrator	27	5.4
No Suggestion	10	2

Table-4: Summary

	No.	%
Students considering cadaver dissection essential	230	46.0
Students not considering cadaver dissection essential	160	32.0
Undecided	110	22.0

DISCUSSION

It is an established fact that students learn Anatomy from the dead. Review of previous literature reveals that there are varying responses with regards to the attitudes, emotions and views of medical students towards cadaver dissections. More research in anatomy education is necessary to counter balance emotional arguments about dissection with scientific evidence.[6]

Winkelmann *et al* state that one needs to bear in mind, both in general discussions about dissection and in the planning of dissection courses, that a dissection course is not a uniform learning experience. Students within the same course seek divergent learning experiences.[7]

Over the last 10–15 years, increasing attention has been drawn to the traumatic effects of dissection on some students and the implications of such trauma on subsequent education and practice.[8] Aspects of dissection that medical students are reported to find distressing include revulsion at the sight and smell of the cadavers, shock at confronting death, desecration and dismemberment, violation of cultural taboos, dehumanization, and invasion of privacy.[9]

While exploring the reasons dissection was found to be emotionally disturbing on initial exposure for 16.2% students. A previous study had suggested that the initial stress associated with human dissection dissipates relatively rapidly.[10] In another study author mentioned that 47.5% expressed emotional disturbances at initial exposure and 18.75% expressed anxiety and stress.[11] Some of the students feel anxiety and even tremor of hands while dissecting so they avoid dissection to avoid embarrassment.

In our study 16.28% students avoided dissection due to some kind of fear like nightmares etc. Nightmares were actually felt only by 7.4% though. Our finding was significantly different from the previous study in which Abu Hijleh *et al* reported that 46.5% of their students expressed some level of fear before dissections.[12]

In almost all religions dissection is permitted as an exception for the sake of seeking knowledge for future doctors. Even in Islam using the bodily parts of a dead person is permissible for the students of medicine who do so as a way of training.[13] Nonetheless, people still have varying beliefs on dissection. In our study 18.6% students admit that they didn't perform dissections because of religious beliefs.

Many of us living in today's civilised world consider it unethical to open dead bodies. According to Winkelmann *et al* those students with ethical concerns regarding dissection tended to spend less time with active dissection, although not less time with prosection.[7] In our study, 37.6% declared dissection as unethical.

Most of us in all religions/cultures grow up learning to respect the dead bodies. It is therefore, natural for some students to develop very personal and respectful relationships with the cadavers they handle. In our study we found 21.8% students avoided dissections due to a feeling of respect for the body.

World over, the cadavers are preserved with formaldehyde and we know a very peculiar smell which is a hallmark of dissection hall and a very high

percentage of students, i.e., 45% out of 500 students attributed staying away from the dead body due to this irritating smell. In addition, formaldehyde exposure may cause health problems like asthma in some medical students/teachers performing dissections. In a previous study about 9.4% of students thought that toxic chemicals which are used as preservatives are dangerous.[14]

No interest in surgery and motivation for dissection was the reason quoted by 21.8% of students. Collins recommended demonstration of prosected cadavers instead of dissection for those students not contemplating a surgical career.[15]

About 8.6% said that they have no solid reason of avoiding dissection except laziness. According to Dotinga spending a whole afternoon getting under the skin, digging through fat, getting around bones and dissecting tissues is considered time consuming and too much work.[16]

Less number of cadavers and demonstrators mean longer waiting times for students even if they are interested. Less interest in dissection coupled with less than required number of demonstrators and cadavers, is allowing young students to get away without dissections and pass out as medical practitioner/surgeons without adequate knowledge of anatomy. About 5.4% of the surveyed students (Table-3) suggested increase in the number of demonstrators who can spearhead dissections and provide motivation, drive and strictness, where required, to help students overcome their inhibitions. Likewise, increased number of cadavers can reduce wait times and improve student participation in dissections.

In some medical schools, computers are now used as an adjunct to dissection, enabling students to see before they do. However, tools like interactive multimedia resources, models and specimens have not replaced students' perceptions about the importance of dissection. About 60.8% students in our survey thought that dissection is the best teaching and no computer can give you hands-on experience to clearly understand the functional relationships between intricate parts of the body and despite its important strengths; models cannot simply substitute for cadaver dissection. We agree with the study in which authors tried to compare effectiveness of cadaver dissection with computer resources and found that the traditional teaching group obtained better results than the technologically supported group.[17]

According to Pabst 'Due to the great variability in the number of teaching hours, type of teaching methods, previous qualifications of medical students, number and qualification of demonstrators and several other parameters it is impossible to assume one experiences in institutions and/or country to be valid for another'.[18]

Our study reveals Pakistani perspective of this debate. Although majority of the students were not found actually performing dissections but their perception about the importance of dissection was positive; cadavers were perceived as an excellent resource for learning anatomy. In our study students were almost unanimous that dissection provided them with a three-dimensional perspective and deepened their understanding of anatomical structures. Interestingly, increased availability of innovations used in teaching anatomy, such as interactive multimedia resources, models and specimens have not diminished the importance of dissection in the eyes of the medical students (Table-3, 4).

Dissection has survived the most rigorous test, i.e., the test of time and has remained relevant for a very long time.[19] We just need to address/resolve the reasons/ problems identified in this study to raise the number of medical students getting benefited from dissections.

This study covers medical colleges in Abbottabad and Rawalpindi/Islamabad region only and may have the limitation of not being truly random because of some kind of bias arising out of this. Furthermore, the number of medical students included in the study is also limited to five hundred. Collection of similar data from medical colleges across Pakistan in a future study is solicited.

CONCLUSION

Medical students are depriving themselves of this extremely effective learning tool–dissection–for various inhibiting reasons. Medical colleges need to take cognizance of these inhibiting factors and make efforts to address these. Availability of sufficient cadavers and increased number of demonstrators who could lead and motivate students out of their inhibitions could be a step in this direction.

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