Introduction

Lectures can be traced as far back as the Greeks of the fifth century BC, and lectures were the most common form of teaching\(^1\). Many instructional tools are identified for effective transfer of information to students, but as a rule lectures remain an important component of medical education\(^2\). In the early years of undergraduate medical education students attend more lectures than they see patients. Lectures are a substantial part of the learning experiences of students and so merit our attention\(^3\). The most common method of teaching for medical students is lecture. Though small group learning is the best way for teaching, still we prefer lecture as we have a large numbers of students. Hence, it is immensely important that lecture should be as effective as possible\(^4\).

Use of teaching aids in medical education technology is swiftly changing from blackboard to virtual simulations and teaching methods range from lectures to integrated teaching\(^5\). However, the optimum use of audiovisual aids for lecture delivery is essential for deriving their benefits \(^6\). Although the maximum benefit of visual aids is obtained only in conjunction with a well structured lecture, comparison of the recall of visually and verbally presented lecture information has shown a clear superiority of visual information over verbal information for both immediate and long-term recall\(^7\). At present, the most common ways of lecture delivery include the lectures using power point (PPT) presentations, lectures utilizing the transparency and overhead projector (TOHP) besides the traditional ‘chalk and talk’ by the Blackboard method\(^8\).
There is a mixture of views based on various studies and it is not clear whether a particular lecture delivery method is superior to others. Limited research, specifically from medical education, exists on this subject in India. With this background, the present study was undertaken to find out student's preferences regarding different lecture delivery methods for undergraduate medical teaching and also to know their perceptions about teaching in medicine.

**Material and Methods**

The study was conducted at the Maharajah’s Institute of Medical Sciences (MIMS) medical college, Nellimarla during November-December 2012. It was a descriptive cross-sectional type of study undertaken among second year MBBS students (n=56). The students were explained regarding the nature and purpose of the study. Data collection was done with the aid of printed pre-designed and pre-structured questionnaires for comparison of lecture delivery methods and feedback. The study was carried out in two phases: viz, 1. Lectures delivered in three different methods and 2. Feedback from the study participants. Initially 3 different classes were taken on different days using different lecture delivery methods. To minimize the bias, same teacher delivered these lectures to same students. The lecture series was on medical entomology topic with subtopics as follows: (a) Diseases transmitted by mosquitoes and control measures against mosquitoes, covered with the aid of Chalk & talk, (b) Fly transmitted diseases and control measures taught with the aid of Over head Projector and (c) Tick, mite & flea transmitted diseases and control measures which was taught with aid of liquid crystal display (LCD) Projector using a power point presentation. During each class, students were asked to write answers for 10 questions related to that particular topic as a pre-test and a post-test. Each student was given marks out of 10 and mean for that particular method for lecture delivery was calculated. The marks of students in each of the three methods were taken for obtaining the final assessment score regarding each of the lecture delivery method. The mean scores of these lectures were statistically compared. After the completion of this lecture series, feedback from the study participants was obtained on a printed questionnaire with close ended questions about their preferences and perceptions of medical teaching. Data entry was done in Microsoft office excel 2007 and analysis was done with the help of SPSS version 20.0 to calculate mean, standard deviation (SD) and p-value.

**Results**

Total number of study participants was 56, of which male students were 17 and female students were 39 in number. Results regarding performance of students by different lecture delivery methods are summarized in table 1.

<table>
<thead>
<tr>
<th>Teaching aid</th>
<th>Pre-test Mean</th>
<th>Pre-test SD</th>
<th>Post-test Mean</th>
<th>Post-test SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chalk &amp; talk</td>
<td>2.92</td>
<td>1.87</td>
<td>8.5</td>
<td>1.22</td>
</tr>
<tr>
<td>OHP</td>
<td>3.03</td>
<td>1.92</td>
<td>7.2</td>
<td>1.68</td>
</tr>
<tr>
<td>LCD</td>
<td>3.09</td>
<td>1.96</td>
<td>8.2</td>
<td>1.33</td>
</tr>
</tbody>
</table>

**Table 1. Students marks by different lecture delivery methods**

<table>
<thead>
<tr>
<th>Usefulness in understanding</th>
<th>Theory No. (%)</th>
<th>Clinics No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 - 50%</td>
<td>4(7.14)</td>
<td>2(3.57)</td>
</tr>
<tr>
<td>50 - 75%</td>
<td>38(67.86)</td>
<td>34(60.71)</td>
</tr>
<tr>
<td>75 - 100%</td>
<td>14(25.0)</td>
<td>20(35.71)</td>
</tr>
</tbody>
</table>

**Table 2. Usefulness of classroom teaching for better understanding of the subject**
There was an improvement in mean scores during the post-test as compared to the pre-test for chalk & talk (p value <0.0001), OHP (p value <0.0001) and LCD (p value <0.0001). As seen from the table 1, the SD of the scores was less for the post-test as compared to the pre-test by each of the method, thus making it obvious that the post test scores of the students did not vary as much as their pre-test scores. One way Analysis of varience (ANOVA) test was applied to detect significance of differences in the students’ mean scores during the pre-test as well as post-test for each of the teaching methods used in the study. The results of the ANOVA test indicated no significant difference between the mean scores of the different methods during the pretest (F=0.113, p value =0.893). However a highly significant difference was noted between the mean scores by teaching methods (F=12.803, p value <0.001) for the post test. The difference in scores between lectures using Blackboard and LCD was statistically not significant (p value =0.215) for post test. But the difference in scores between lectures by Chalk & talk and OHP was statistically highly significant (p value < 0.001). Similarly, the difference in the scores between lectures with OHP and LCD was statistically significant (p value < 0.001).

Table 3. Preferred duration of theory class

<table>
<thead>
<tr>
<th>Duration</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 min - 1 hour</td>
<td>24</td>
<td>42.86%</td>
</tr>
<tr>
<td>1 – 1.5 hour</td>
<td>3</td>
<td>5.36%</td>
</tr>
<tr>
<td>Depends on topic &amp; teacher</td>
<td>29</td>
<td>51.78%</td>
</tr>
</tbody>
</table>

Table 4. Active involvement in learning by students

<table>
<thead>
<tr>
<th>Seminars &amp; tutorials</th>
<th>Male students</th>
<th>Female students</th>
<th>Total students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>5</td>
<td>26</td>
<td>31</td>
</tr>
<tr>
<td>No</td>
<td>12</td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>39</td>
<td>56</td>
</tr>
</tbody>
</table>

Chi square=6.6, p value = 0.009916

Figure 1. Preferred method of teaching from feedback

The preferences and perceptions of the students regarding teaching as obtained from feedback are represented ahead.

In the written feedback students were asked to mention the method of their preference from amongst Chalk and talk, OHP or LCD. This is shown in figure 1.

All the students responded that find teaching during theory classes as well as the clinic useful in understanding the subject. The usefulness was graded as shown in the table 2.

The study participants were asked about their perception regarding field posting as a part of clinical posting for Preventive and social Medicine. Total 51 (91.9%) of the students were
in favour of field posting and remaining 5 (8.1%) expressed that there should not be any field visits.

Involvement of students in learning increases the understanding. When asked whether such active involvement by students should be included in form of compulsory tutorials and seminar presentations by the students, 31 (55.36%) of them gave a positive response. The details are represented in the table 4.

Discussion

The value of classroom teaching in medical education is being debated over the past few years partly due to the advent of newer technologies for learning such as video-streaming and online lectures, and partly due to disinterest by students reflected as their decreased attendance in classrooms. In this context, feedback from students about adopted teaching methodology is a useful basis for modifying and improving the quality of the educational system.

The post-test scores were higher than the pre-test scores for all the lectures. These were noted to be statistically significant. An increase in the post test scores by lectures has been reported in another study on a large group of non-medical students. Comparison of mean scores by different lecture delivery methods revealed maximum scores by chalk and talk followed by powerpoint and TOHP. Similar finding of statistically significant higher marks by using Blackboard has been reported by other authors in their study. In the present study, the difference among the mean marks of students taught by these three methods was statistically significant (p value < 0.001). This finding coincides with another study showing statistically significant difference in the scores by different methods.

The feedback from the students showed that preferred method was powerpoint using LCD. Other researchers also reported a student preference for powerpoint. This is in contrast to observations in yet other studies where medical students expressed that they prefer traditional Blackboard teaching over the multimedia approach of power point using animations. In the present study all the students opined that classroom teaching was useful, and three-fourths of the students found classes helpful in understanding the subject by 50-75%. This is coinciding with other studies done earlier where medical students had expressed that theory classes are helpful and lectures develop the ability to understand the topic better. In the present study maximum students perceived that duration of theory class should depend on the topic and the teacher or it should be between 30 min to 1 hour. Preferred duration of theory class as 45 minutes has been reported in another study also. This can be explained based on the fact that the concentration decreases when the duration of the class is longer. This is immensely important in medical education as learning the medical subjects requires a continuity of thought along with full concentration on part of the medical students. Longer duration of theory classes may not fulfil with this requirement. Further teaching skills and ability to communicate with the students vary from teacher to teacher. The same difficult to understand topic when is covered by a teacher in an interesting way, the understanding increases. This might be the possible reason behind the students’ preference that duration of class should depend on the teacher. It was observed in the current study that more than half of the students were in favour of active involvement of students in learning. Number of female students having an opinion that students should be actively involved in learning was significantly higher (p value = 0.009916) as compared to male students. Another study also revealed a similar finding wherein 64 % students found active involvement such as revision cum self study as the best form of learning. But seminars were not preferred by the study group of other workers.
Thus mixed preferences regarding lecture delivery methods, duration of classes and inclusion of seminars were observed in the present study. Inspite of the variations in the preferences and perceptions, one thing which emerged as an important result of the study is that classroom lectures surely help in understanding the subject for medical students. This is noteworthy in the context that the current techno-savy generation is assumed to favour internet based learning.

Conclusions

The present study which shows higher post-test scores as compared to the pre-test scores of the students by all the lecture delivery methods clearly highlights that classroom teaching by lectures still holds an upper hand. Maximum mean score during lecture series was with use of chalk & talk followed by LCD. Feedback from students however revealed LCD as most preferred method. In a nutshell, performance of the students’ revealed chalk & talk as the best method of lecture delivery in contrast to power point by LCD as preferred method obtained from feedback. Thus although the students’ preferences was for multimedia methods, their actual understanding of the subject was best by use of the traditional method. So it rests in hands of a trained teacher to make teaching more interactive and interesting especially when the medical subject is so vast. Any teaching aid would be effective when it is used by teachers in appropriate way. This underlines the importance of regular teacher training programmes and the need for formal training in teaching technologies to develop good presentation skills.

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Interest of conflict: None

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